SPIRAX SARCO, INC. PRODUCT HANDBOOK

SIXTH EDITION

MAY 2026 **VOLUME 1**



First for Steam Solutions

EXPERTISE | SOLUTIONS | SUSTAINABILITY

spirax sarco

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Spirax Sarco, Inc. Product Handbook
Sixth Edition

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United States of America 08/2025

SPIRAX SARCO, INC. PRODUCT HANDBOOK

SIXTH EDITION

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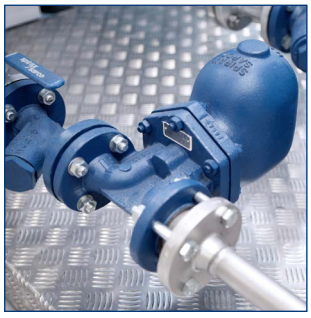
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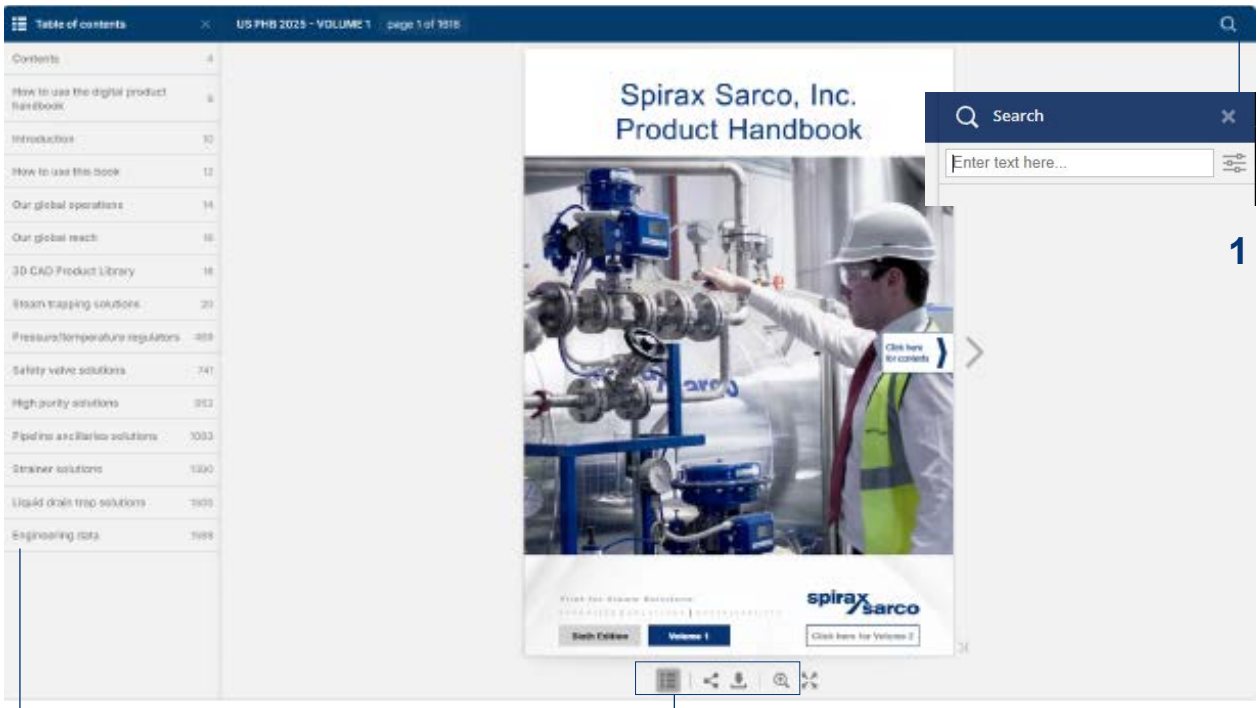


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- Left click the arrow on the right or left hand side of the pages.
- Use the buttons below

1	Search function	To search for an item use the text field at the top right of the screen and enter a Spirax Sarco product name or reference number. You will often get more than one result, this is because all the instances are listed. By selecting any entries in the list, you will jump directly to that document, with the word you searched for highlighted. (Note: please do not use spaces between nomenclature .i.e. type PN1000 rather than PN 1000 and when typing a reference number please use hyphens i.e. P612-14).
2	Table of contents	These should be left on before continuing into the Product Handbook.
3	Share	This option allows you to share the document
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5	Magnifier tools	This enables you to zoom in and out of the page for closer detail. There is a zoom bar at the bottom.

INTRODUCTION

The Spirax Sarco Product Handbook contains the technical information for our most popular range of products for steam and other industrial fluids. You can search for products by product nomenclature / name, product range and by document number.

As well as the products, many Spirax Sarco companies can supply further products or services on request. These may include steam trap surveys and complete packaged solutions which can provide you with plant automation. If the product or service you need is not listed in this handbook, contact your local Spirax Sarco sales company representative.

The documents shown are for initial specification purposes only. Safety information together with installation and maintenance instructions are provided with every product supplied. Consult your local Spirax Sarco office if you require help in correctly selecting your product.

The latest technical information is available for our full product range on spiraxsarco.com. The website also offers other practical information, such as the Steam Engineering Tutorials, which provides useful advice on the design and maintenance of steam and condensate systems, and other resources such as a Unit Conversion Calculator and Steam Tables, to help you with day-to-day engineering calculations.

Please note that this is an international publication and not all products are available in all countries.

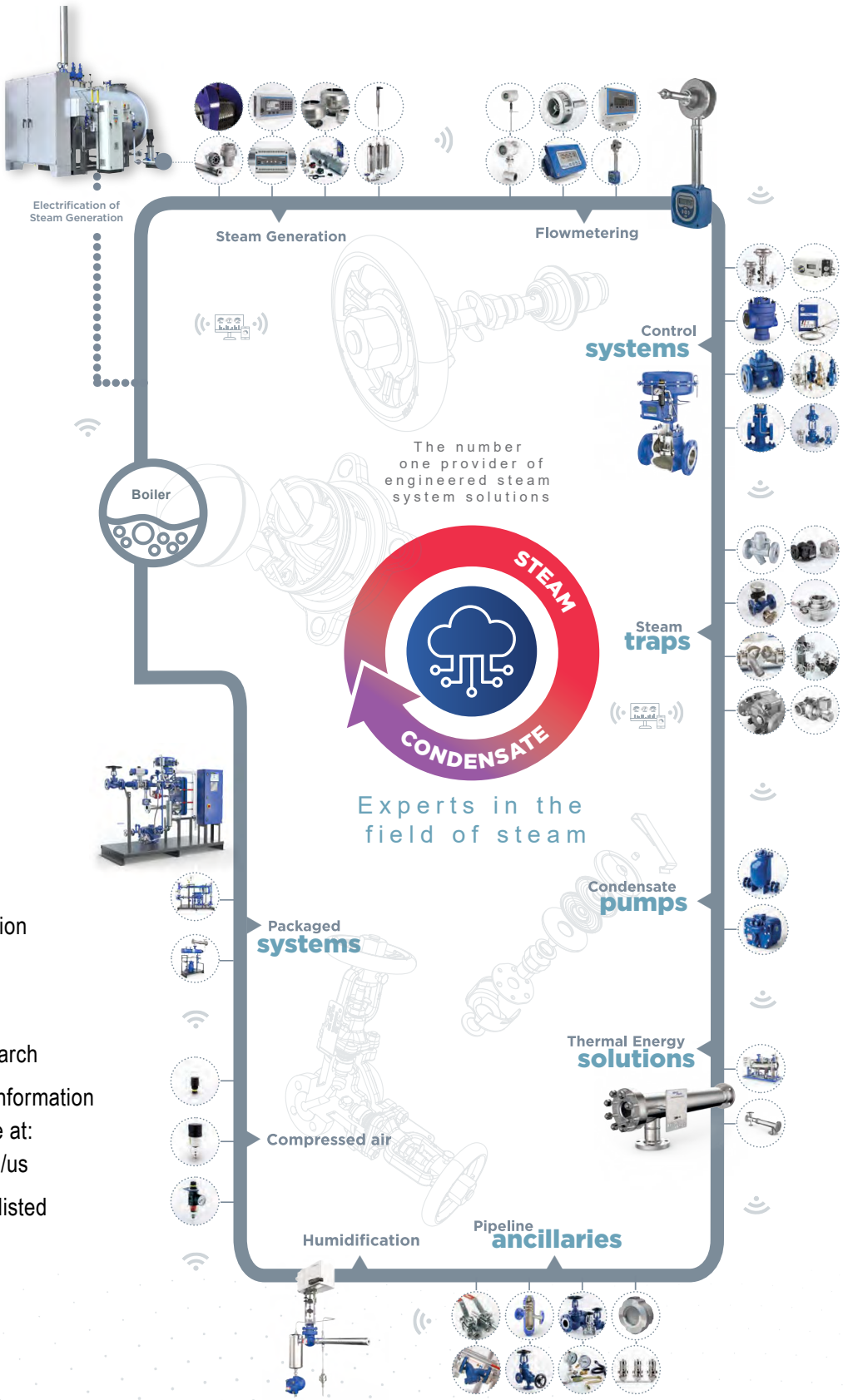
Our product range - designed to meet your challenges

We offer our customers a complete range of products that cover the entire steam and condensate loop from spare parts, steam trap stations, a complete plant room package, a blowdown valve to a complete boiler house. Whatever your requirement we can help you.

In addition you have the reassurance that because we design, develop and manufacture virtually all of the products we sell, we know what we are offering you, we can advise you technically, and continue to support you after you buy.

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- Fit for purpose design
- University links for research
- All customer technical information available on our website at: SpiraxSarco.com/global/us
- 12,000 steam products listed

For more information contact your local Spirax Sarco Representative, call:

Toll Free 1-800-883-4411

HOW TO USE THIS BOOK

Accepted international designations for limiting conditions are used throughout this catalog.
An explanation of Pressure Shell Design Conditions and Limiting Operating Conditions follows:

Pressure shell design conditions:

- PMA - Maximum Allowable Pressure
- TMA - Maximum Allowable Temperature

These are the maximum pressures and temperatures to which the pressure shell (body, cover, bolting, etc.) of the product may be safely and permanently exposed. The product may or may not operate properly at these maximum conditions; the internal parts may be damaged or destroyed, but the pressure-retaining components will not break or become permanently distorted. It is sometimes permissible to exceed the maximum allowable conditions temporarily. For example, a cold hydraulic test at 1½ times the cold PMA is usually permitted.

Because the maximum allowable pressure depends on the temperature, there is no one value for PMA. Quoting only the cold PMA without mentioning the corresponding temperature could be misleading. PMA is usually given at three temperatures:

- Cold
- Maximum Allowable Saturated Steam Temperature
- Maximum Allowable Temperature

There is only one value for maximum allowable temperature (TMA); the corresponding pressure range is given in this literature.

PMA and TMA are strictly safety related. They have very little to do with the actual operation of the product.

Limiting operating conditions:

- Maximum Operating Pressure - PMO
- Maximum Operating Temperature

PMO is the maximum fluid (steam, gas or liquid) pressure at which the product will operate properly. Depending on the type of product, PMO may or may not be related to temperature. Unless otherwise indicated, the downstream pressure is assumed to be 0 psi g.

Maximum operating temperature may depend on superheat tolerance, internal materials (e.g. neoprene o-rings), pressure shell design conditions, or any combination of these factors. Depending on the type of product, it usually varies with the actual operating pressure.

An example on the next page graphically illustrates limiting conditions.

Example of limiting conditions

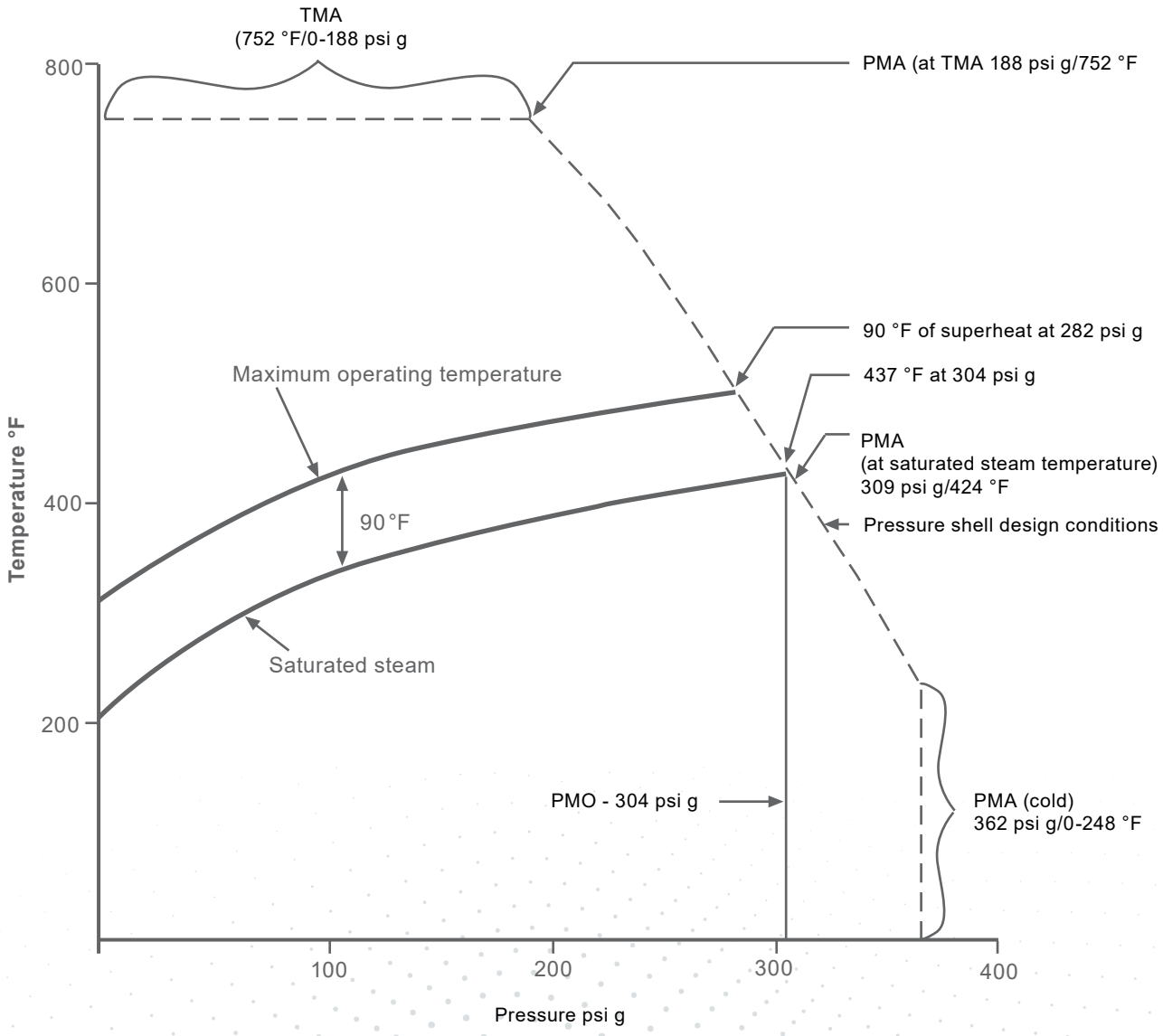
BPT21 Steel-Bodied Balanced Pressure Thermostatic Steam Trap

Limiting Operating Conditions

Maximum Operating Pressure (PMO)	304 psi g
Maximum Operating Temperature	437 °F at 304 psi g; 90 °F of Superheat at Operating Pressures below 282 psi g

Pressure Shell Design Conditions

PMA (Maximum Allowable Pressure)	362 psi g/0-248 °F 309 psi g/424˚ F 188 psi g/752 °F
TMA (Maximum Allowable Temperature)	752°F/0-188 psi g



OUR GLOBAL REACH AND OPERATIONS



We deliver global solutions and local expertise through our network of operating companies, manufacturing sites, sales offices and distributors worldwide.

Discover how we can help you optimise your system and achieve your goals at spiraxsarco.com.

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ACCESSING THE 3D CAD PRODUCT LIBRARY

To help with the planning and design of your steam system with our products, we provide a comprehensive library of 3D product models available for instant download.

Content

You can browse, search and filter on product attributes, and view your selection online in 3D prior to downloading. After registration you will be able to download the model in a choice of industry standard 2D or 3D CAD file formats. Alternatively, a specification document can be generated in PDF format that comprises the product data with either static 2D drawings or interactive 3D model content.

Missing models

We offer a wide and comprehensive product range, therefore unfortunately not all products have associated models yet. For models that are not currently available within the library, a free model request service is provided. Simply provide us with as much detail as possible about the product you require and we will create the model as soon as we can, usually within 48 hours*.

Request for quotation

Should you wish to be provided with a quotation for the selected product, use the ‘Request for Quotation’ tab and your request will be sent to the local sales office or representative in your country.

Click to visit our online 3D CAD Product Model Library

STEAM TRAPPING SOLUTIONS



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IPC20 and IPC21 Pipeline Connectors with Integral Spiratec Sensors	TI-P128-17-EN
UTD52 Series Universal Thermodynamic Steam Trap	TI-P017-12-US
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Thermodynamic Steam Trap TDT Tracer Trap	TI-P019-07-US
TD42L and TD42H Thermodynamic Steam Traps	TI-S01-03-EN
TDC46M Carbon Steel Thermodynamic Steam Trap with Maintainable Seat	TI-P187-04-EN
TDS46M Stainless Steel Thermodynamic Steam Trap with Maintainable Seat	TI-P187-02-EN
TD62LM and TD62M Thermodynamic Steam Traps with replaceable seats (Screwed/Socket Weld)	TI-P068-08-EN
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	Cast Iron Float and Thermostatic Steam Traps FTB Super Capacity Series	TI-P034-01-US
	Cast Steel Float and Thermostatic Steam Traps FTB Super Capacity Series	TI-P034-02-US
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FTC62 Carbon Steel Ball Float Steam Traps	TI-P179-13-EN
FTS62 Stainless Steel Ball Float Steam Traps	TI-P179-14-EN
FTC80 FB Cast Steel 1½" and 2" Ball Float Steam Trap	TI-P179-02-EN
Stainless Steel Float and Thermostatic Steam Traps FTS150, FTS300	TI-P038-05-US
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	BPC32 and BPC32Y Carbon Steel Balanced Pressure Thermostatic Steam Trap	TI-P005-01-EN
	Balanced Pressure Thermostatic Steam Trap MST21 and MST21H	TI-P125-08-EN
	Balanced Pressure Thermostatic Steam Trap SBP30LC	TI-P120-01-EN
Inverted Buckets	Cast Iron Inverted Bucket Steam Traps B Series	TI-P041-01-US
	Cast Iron Inverted Bucket Steam Trap B Series Capacities Chart	TI-P041-02-US
	Cast Iron Inverted Bucket Steam Trap Series 200	TI-S03-03-EN
	Steel Inverted Bucket Steam Trap Series HM 34	TI-P072-01-EN
	IBV Series C, Z, C-LF2 Inverted Bucket Vertical Steam Trap	TI-P067-10-EN
	IBV Series C-LF2 Carbon Steel Inverted Bucket Vertical Steam Trap	TI-P067-13-EN
	IBV Series Z Alloy Steel Inverted Bucket Vertical Steam Trap	TI-P067-15-EN
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Bimetallic	SMC32 and SMC32Y Carbon Steel Bimetallic Steam Trap	TI-P076-10-EN
	HP45 Bimetallic Steam Trap	TI-P623-02-EN
	HP70 Bimetallic Steam Trap	TI-P071-01-EN
Fault Detection	Spiratec ST14, ST16 and ST17 Sensor Chambers and Sensors	TI-P086-17-EN
	Spira-tec Remote Test Point R1 and R12	TI-P087-02-EN
	R1C Steam Trap Failure Monitor	TI-P087-32-EN
	Spira-tec Automatic Steam Trap Monitor R16C	TI-P087-20-EN
Manifolds	MSC Manifolds for Steam Distribution and Condensate Collection	TI-P117-40-EN
	MSC-210 Long Pitch Manifold for Condensate Collection	TI-P115-01-EN

TI-P124-02-US
Issue 2

USTS II Universal Steam Trap Station (Requires Universal Trap of Choice)

Description

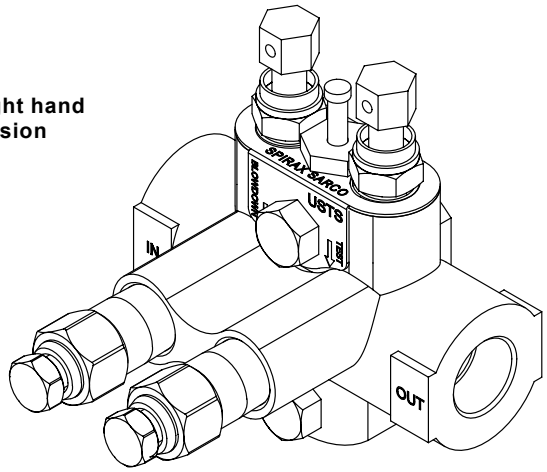
The USTS-II Universal steam trap station is designed to have inlet and outlet isolation valves, an integral strainer with blowdown and a test valve. Designed as a complete steam main drip or tracer steam trap station. The station will support all of the Spirax Sarco universal connection steam traps.

Model	USTS II
PMO	650 psi g (45 bar g)
Sizes	½", ¾" (DN15, DN20)
Standard Flow Direction	Left to Right (Right Hand)
Connections	NPT, SW
Construction	Stainless Steel
Optional Flow Direction	Right to Left (Left hand), handle option

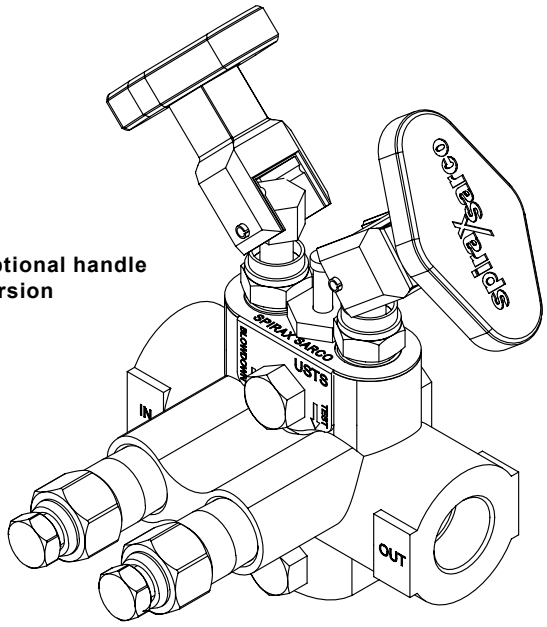
Limiting operating conditions

PMO Maximum operating pressure	650 psi g (45 bar g)
TMO Maximum operating temperature	750 °F (399 °C)
PMA Pressure shell design conditions	650 psi g (45 bar g)

Right hand version



Optional handle version

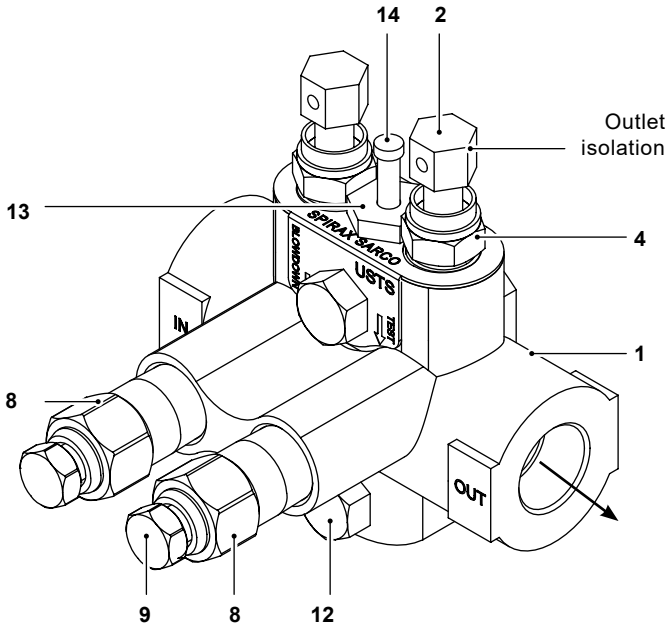


Compatible Spirax Sarco Universal Steam Traps

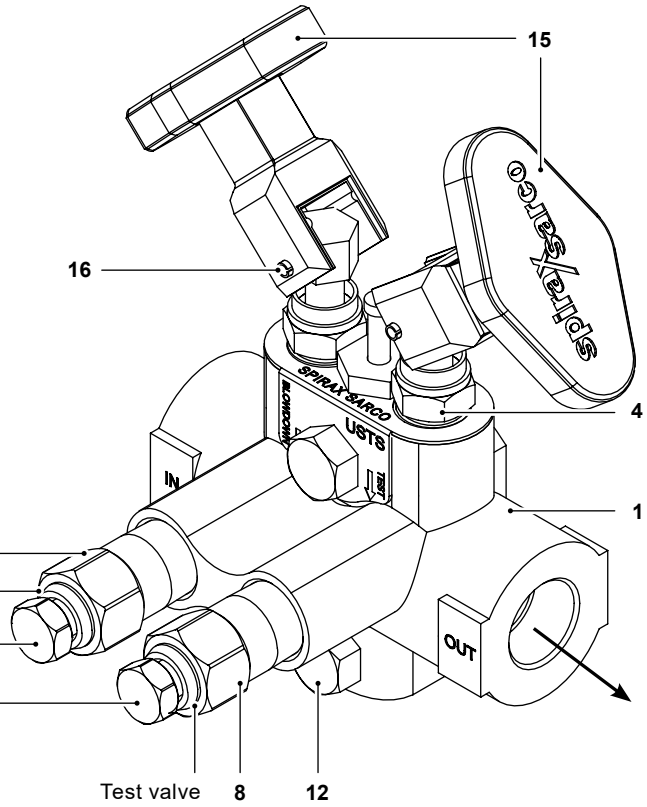
Trap type	Model	Model	Model	Model
Thermdynamic	UTD52L	UTD52H	UTD52-HP	UTDS52L
Balanced pressure	UBP32			
Inverted Bucket	UIB30/4	UIB30/5	UIB30/6	UIB30H/8
Inverted Bucket	UIB30H/10			
Float and thermostatic	UFT32-4.5	UFT32-10	UFT32-14	UFT32-21
Float and thermostatic	UFT32-32			
Bimetallic	USM21			

Materials

Right hand version



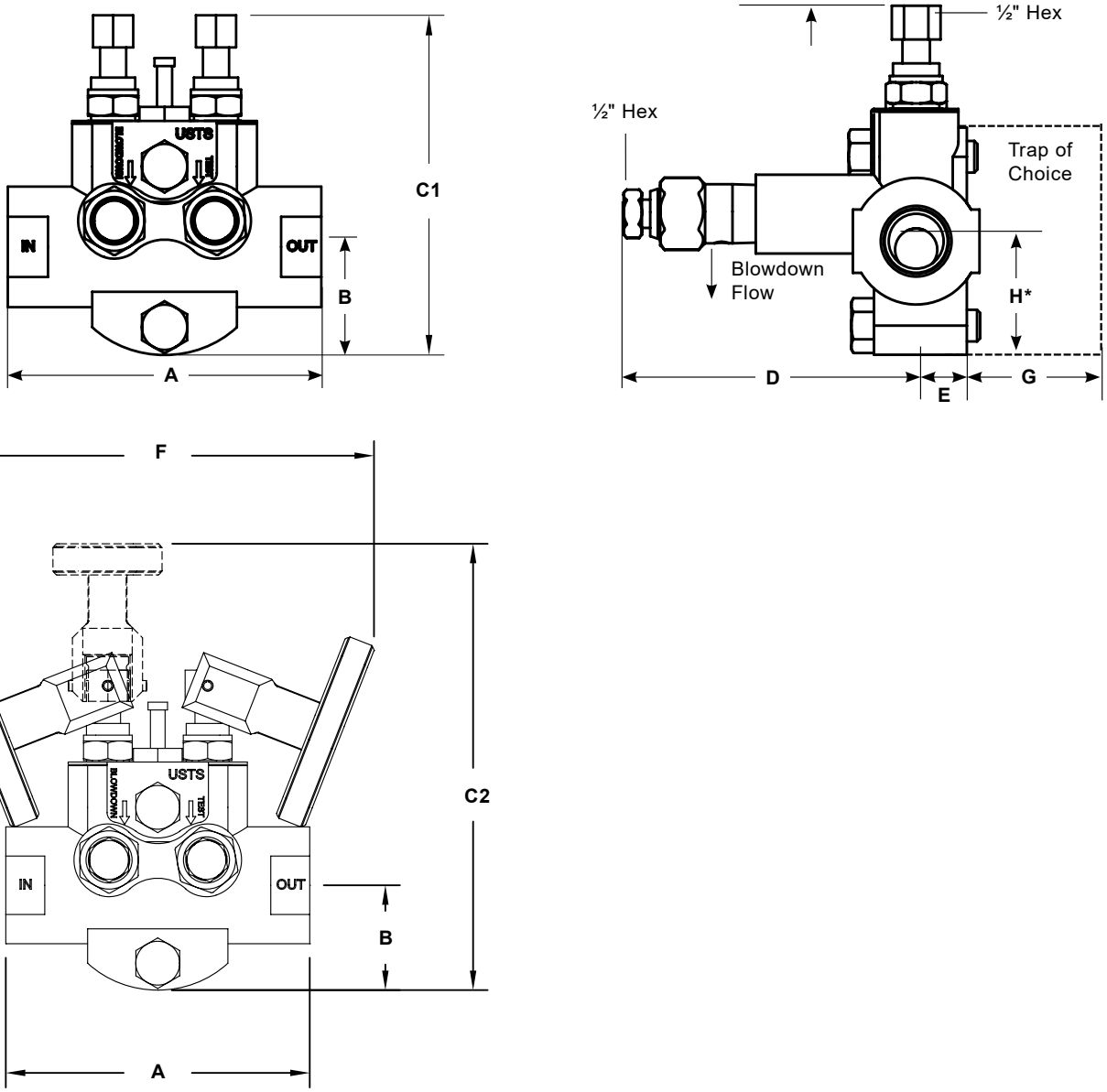
Optional handle version



No.	Part	Material	
1	Body casting	Stainless steel	ASTM A351 CF8
2	Valve spindle	Stainless steel	
3	Valve head (internal)	Stainless steel	
4	Valve packing unit	Stainless steel	
5	Valve packing (internal)	Graphite	
6	Washers (internal)	Stainless steel	
7	Strainer screen (internal)	Stainless steel	
8	Blowdown valve body	Stainless steel	
9	Blowdown valve stem	Stainless steel	
10	Blowdown ball head (Internal)	Stainless steel	
11	Blowdown retaining clip (internal)	Stainless steel	
12	Connector screws	Alloy steel (Plated)	ASTM A193 Gr.B7
13	Locking Nut	Stainless steel	
14	Locking Nut Pin	Stainless steel	
15	Handle	Stainless steel	
16	Handle Pin	Stainless steel	

Dimensions/weights (approximate in inches (mm) and lbs (kgs)

Right hand version shown



Dimensions

A	B	C1	C2	D	E	F
3.9" (99)	1.4" (36)	3.7" (94)	5.7" (145)	3.5" (89)	.6" (15)	5.5" (140)

G UTD52L	G UTD52H	G UFT32	G UIB30	G UIB30H	G UBP32
4.3" (109)	4.8" (122)	9.0" (229)	6.2" (157)	9.6" (244)	3.2" (81)

H* UTD52L	H* UTD52H	H* UFT32	H* UIB30	H* UIB30H	H* UBP32
1.3" (33)	1.3" (33)	2.2" (56)	4.9" (124)	6.3 (160)	1.3" (33)

*H = Centerline of trap station connector to bottom of trap

Weights

Station weight (no trap)	3.0 lbs (1.4 kg)	No handles
	3.7 lbs (1.7 kg)	With handles

USTS II sample specification

The USTS steam trap station to be manufactured of all stainless steel construction. The station will have two isolation valves, one trap test valve and one strainer blowdown valve. The test valve is on the discharge side of the trap to test trap function: to depressurize that area, or to check the condensate return lines for plugging. The inlet isolation valve blocks the trap inlet while the outlet valves block the outlet to the condensate return line downstream of the test valve. The station is supplied with an integral inlet strainer with a blowdown valve for clean out and depressurized mode so the trap or strainer can be repaired or replaced. The station will accept all Spirax Sarco universal traps or any competitors traps who use the standard universal connector design. To be supplied with either left to right flow or right to left flow. Handle option available on all models.

Installation

Valve handles to be in upward position, with the strainer pointing straight down and trap connection on the side. Mount selected trap to the connector and torque to proper torque level. On initial start-up turn inlet and outlet valves to test to blow any installation dirt and debris from the system, (be careful to stay away from flow). Turn both valves to the on position.

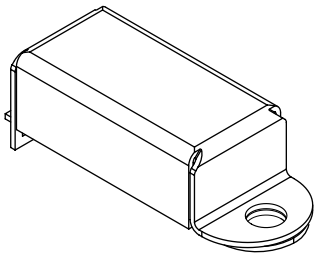
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4

How to order

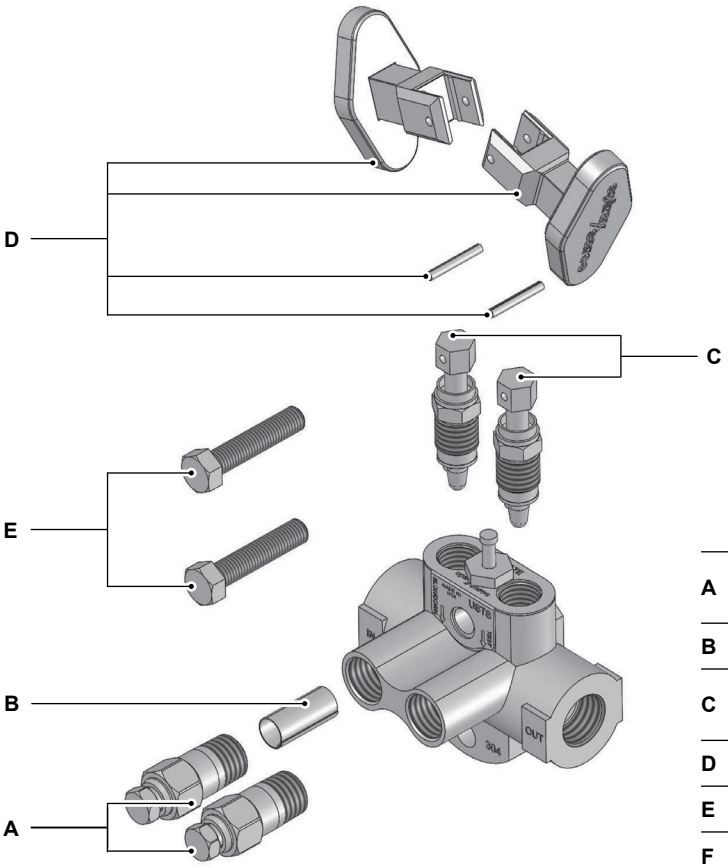
Model number/pipe size/connection type
Example: USTS II ¾" NPT (L/R right hand)

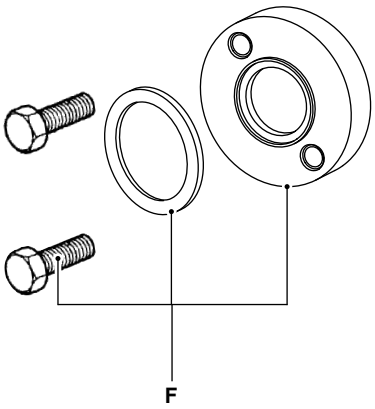
Optional

Lock-out/Tag-out Box for Isolation Valves or Blowdown Valves On Stations Without Handles



Spares parts





A	Blowdown valve Assembly	(2 required for complete station)
B	Strainer screen	(1 required)
C	Valve assembly (isolation)	(2 required for complete station)
D	Handles with pins	
E	Mounting bolts	(2 required)
F	Blind flange kit	

TI-P127-03-US
Issue 2

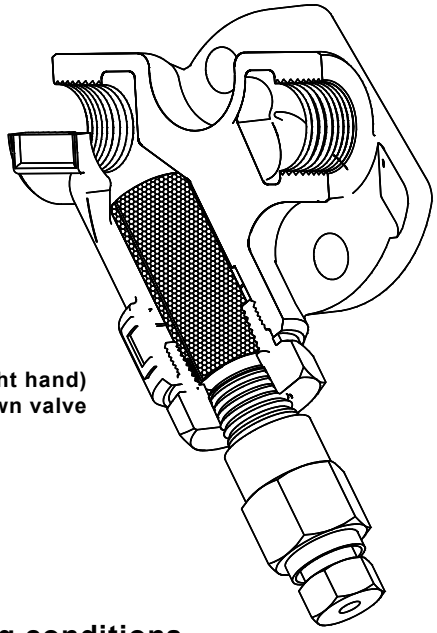
Universal Pipeline Connector (Requires Universal Trap of Choice)

Description

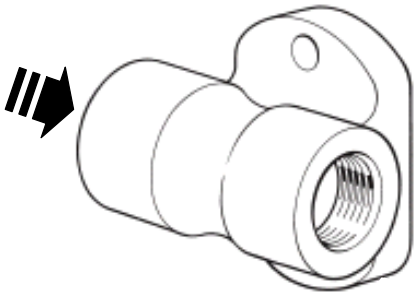
The universal straight connector and the universal strainer connectors for use with UTD52L, UTD52H, UTD52SL, UTD52SH, UTD52L-HP, UFT14, UFT32, UIB30H, UBP32 steam traps. Two bolt quick disconnect design for horizontal and vertical piping installations.

Model	Universal straight and strainer connectors
PMO	Dependent on trap type
Sizes	½", ¾", and 1" (DN15, DN20, and DN25)
Connections	NPT, SW to ANSI 16.11
Construction	Stainless steel (standard)
Options	Left hand, Cast Steel SW only, with Spiratec sensor see TI-P128-17-US

Trap of choice required. Connectors cannot be used alone.



Strainer connector (right hand) with blowdown valve



Straight Universal Connector

Limiting operating conditions

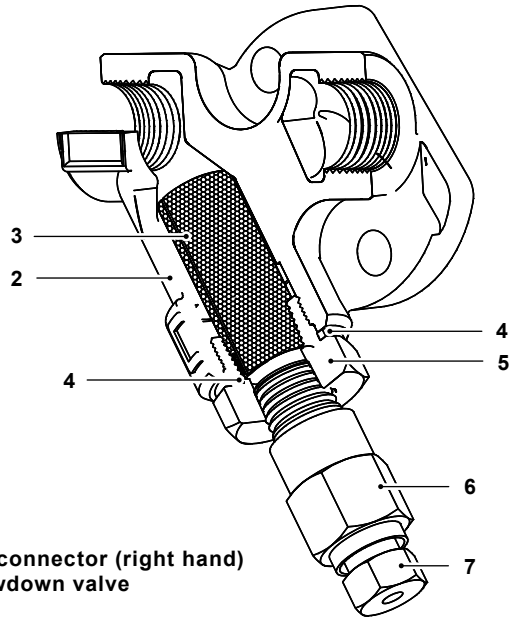
PMO	Maximum operating pressure	600 psi g (41 bar g)	Trap may dictate actual PMO if lower when assembled (See trap TIS sheet)
TMO	Maximum operating temperature	750 °F (400 °C)	Trap may dictate actual TMO if lower when assembled (See trap TIS sheet)

Pressure shell design conditions

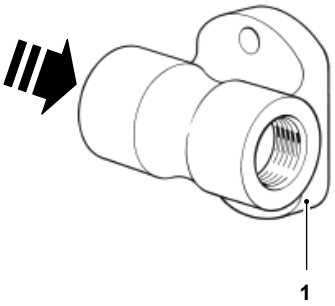
PMA	Maximum Allowable pressure:	720 psi g to 100 °F	50 bar g/up to 38 °C
		600 psi g to 750 °F	42 bar g/400 °C
TMA	Maximum allowable temperature:	750 °F /600 psi g	400 °C/42 bar g
Designed for a maximum cold hydraulic test pressure of		900 psi g	(62 bar g)

Note: selected trap may dictate max allowable pressures and temperatures

Materials



Strainer connector (right hand) with blowdown valve



Straight Universal Connector

No	Part	Material	
1	Standard Straight connector body	Austenitic Stainless steel	ASTM A351 CF8
1	CS straight SW connector body	Cast Steel	ASTM A216 Gr. WCB
2	Standard strainer connector body	Austenitic Stainless steel	ASTM A351 CF8
2	CS strainer connector body	Cast Steel	ASTM A216 Gr. WCB
3	Strainer screen	Austenitic Stainless steel (.8 mm perforations)	316L
4	Cap gasket	Austenitic Stainless steel	BS 1449 304 S16
5	Strainer cap	Austenitic Stainless steel	AISI 303
6	Blowdown valve body	Stainless steel	AISI 303
7	Blowdown valve stem	Stainless steel	AISI 303
8	Blowdown ball head (not shown internal)	Stainless steel	AISI440

Determining whether you need right hand or left hand connector

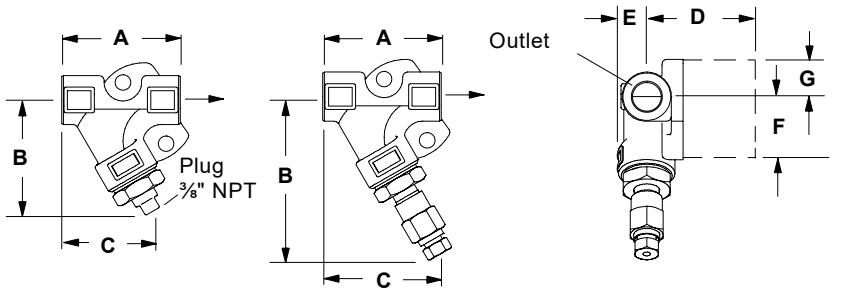
Because of the location or space constraints you may need a right or left hand strainer connector. When straddling the piping in the direction of flow the standard right hand connector will have the trap body facing the left side with the mounting bolt to the right. The left hand strainer connector will have the trap body on the right and the mounting bolts on the left.

Installation

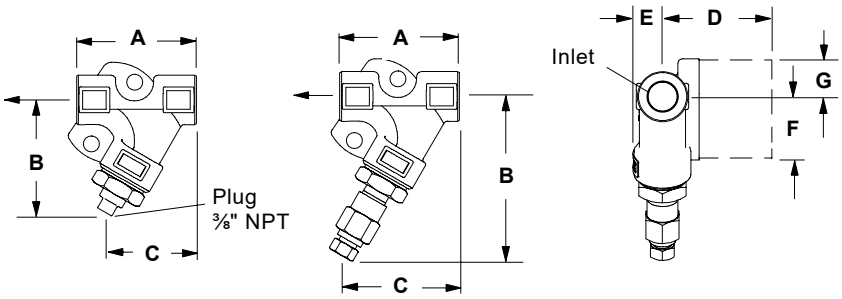
The connector will be installed in a horizontal or vertical pipeline. Full ported isolation valves should be installed up stream and downstream of the connector/trap. The trap shall be fitted as shown on IMI accompanied with the trap.

Dimensions (approximate) in inches (mm)

Right hand strainer connector



Left hand strainer connector

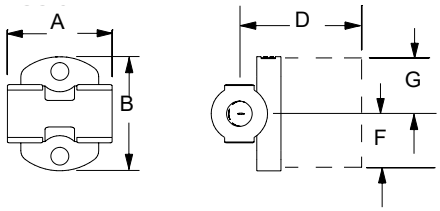


Strainer connector dimensions

Model >	Right hand and left hand standard with ⅜" NPT plug			Right hand and left hand with blowdown valve			All strainer connectors
Size	A	B	C	A	B	C	E
½"	3.2 (81)	3.1 (79)	2.6 (66)	3.2 (81)	4.4 (112)	3.1 (79)	0.8 (20)
¾"	3.5 (89)	3.2 (81)	2.8 (71)	3.5 (89)	4.5 (114)	3.3 (84)	
1"	3.9 (99)	3.4 (86)	3.0 (76)	3.9 (99)	4.6 (117)	3.5 (89)	

Straight connector dimensions

Size	A	B
½"	2.4 (61)	2.7 (69)
¾"	2.8 (71)	
1"	3.5 (89)	



Trap dimensions from centerline of connector piping all type connectors (inches) and trap TI reference

Model >	UTD52L		UTD52H		UTD52SL		UTD52SH		UFT32		UBP32		UIB30		UIB30H	
Size	D	G	D	G	D	G	D	G	D	F	D	F	D	F	D	F
½"	3.3 (84)	2.0 (51)	3.8 (97)	2.1 (53)	5.1 (130)	2.0 (51)	5.4 (137)	2.1 (53)	7.3 (185)	2.6 (66)	2.2 (56)	1.3 (33)	5.0 (127)	4.9 (124)	6.0 (152)	6.3 (160)
¾"		1.8 (46)		1.9 (48)		1.8 (46)		1.9 (48)		2.4 (61)	2.6 (66)		4.9 (124)			
1"	3.4 (86)	1.6 (41)		1.7 (43)		1.6 (41)		1.7 (43)		2.2 (56)	3.3 (84)		5.0 (127)		6.3 (160)	
TI ref.	TI-P017-12-US								TI-P146-05		TI-P127-01		TI-P113-01			
IM ref.	2.5161 US		2.5161 US		2.5161 US		2.5161 US		P146-01		P127-02		P113-02		P113-02	

Operation and maintenance

Only the strainer connector with blow down can be operated. Turning blowdown valve counter clockwise ½" to 1" turn. Clock wise to close. Do not use excessive force to close as damage to seating surface could occur.

Before performing any maintenance make sure the unit is isolated and all pressure has been relieved. When replacing strainer screen remove strainer cap and gasket and remove screen. Replace with new screen and gasket and tighten to 125-140 ft-lbs (169-190 nm). If blow down valve is replaced tighten to 55 ft-lbs (75 nm). See trap IMI for all other maintenance.

Sample specification

Steam trap shall be purchased with the pipeline connector, which once installed remains permanently in the pipeline.

Trap shall be attached to the connector by two bolts to enable simple quick rapid installation and replacement.

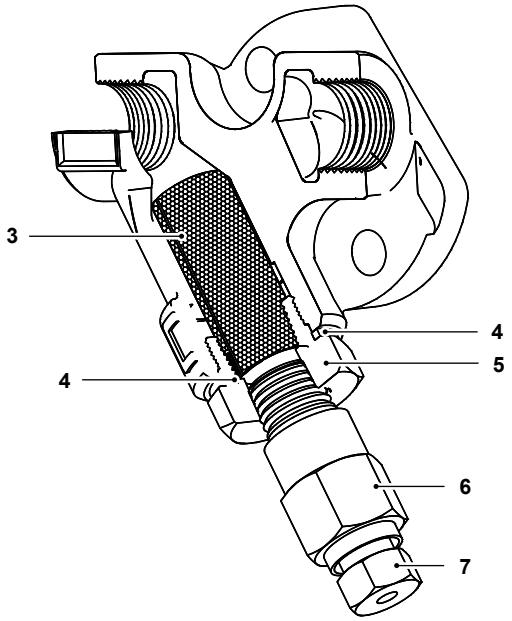
The connection is designed to allow installation on pipe work that is vertical, horizontal, or any angle in between.

When specified, the connector shall be provided with integral "Y" pattern strainer with or without integral blowdown valve right hand or left hand pattern.

2.1

8

Spare parts



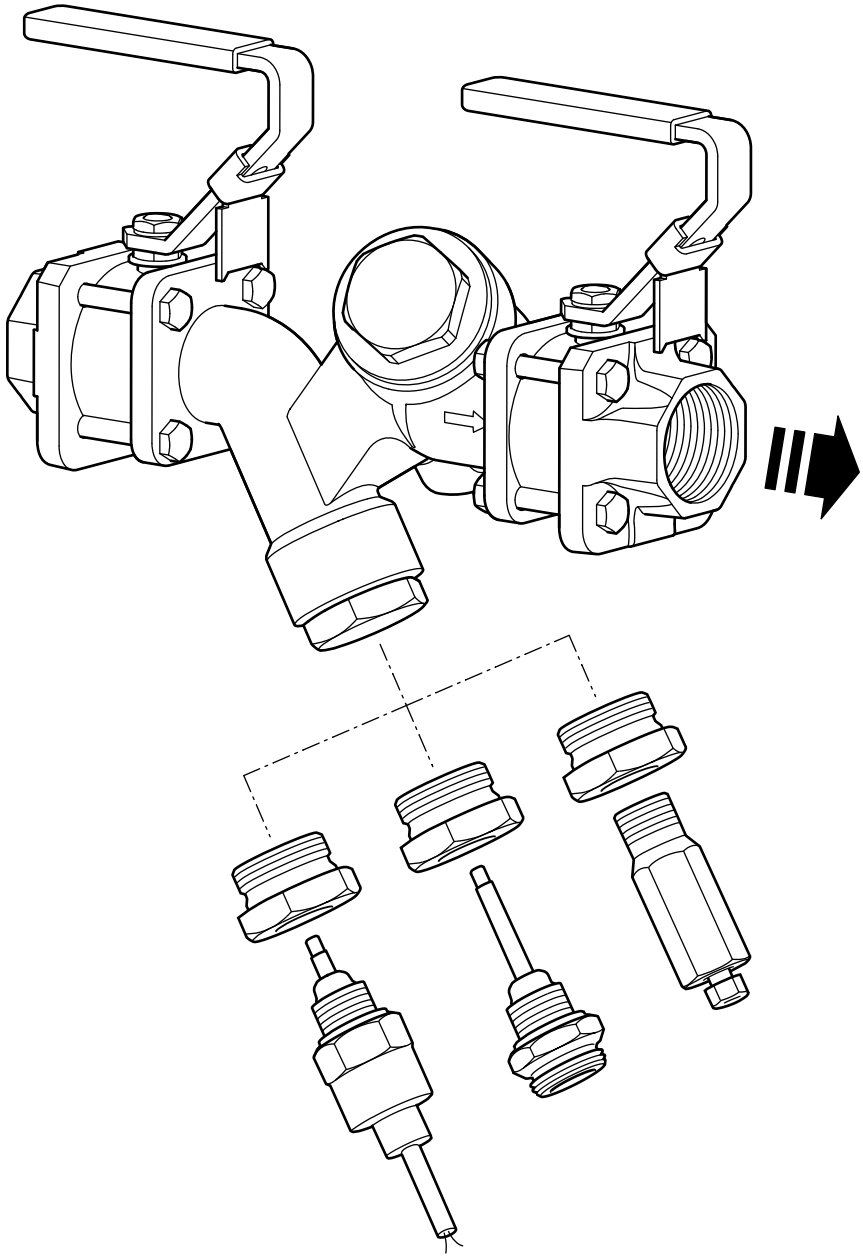
Blowdown valve retro fit kit	**4,5,6,7,8**
Strainer screen	**3**
Strainer cap gasket	**4 (package of 3)**

TI-P128-22
CMGT Issue 14

STS17.2
Stainless Steel
Compact Pipeline Connector Steam Trapping Station

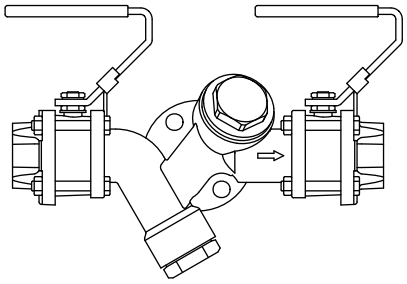
Description

The STS17.2 compact pipeline connector steam trapping station has been designed to provide a convenient ready to install trapping solution, which includes: upstream and downstream isolation valves, body incorporating quickfit connector + strainer and check valve blanking plug.

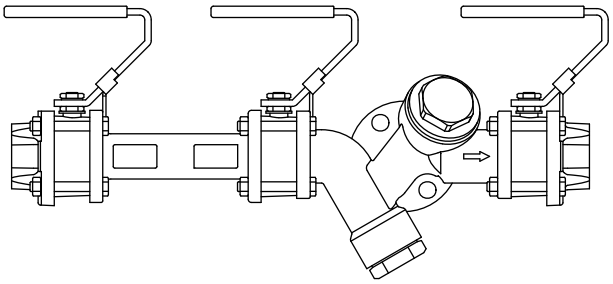


Available types

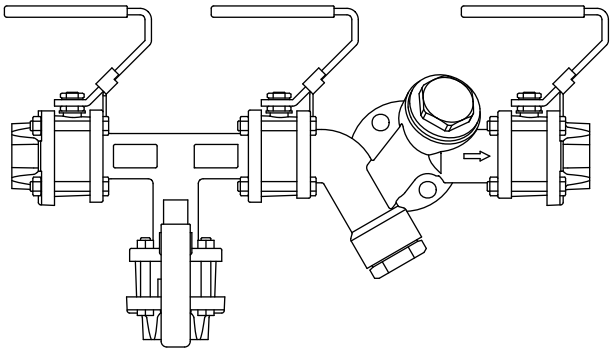
The STS17.2 is available in Single, Double or Double Block and Bleed variations, see below:



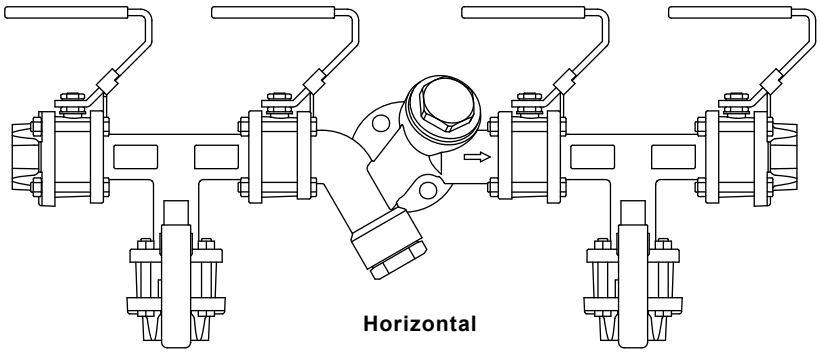
Single Isolation (SB)



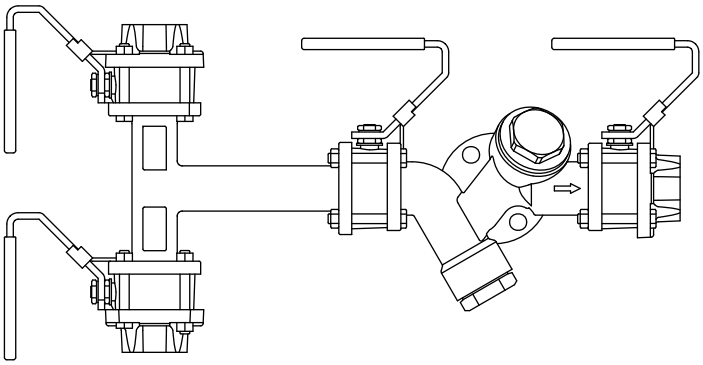
Double Isolation Upstream (DB US)



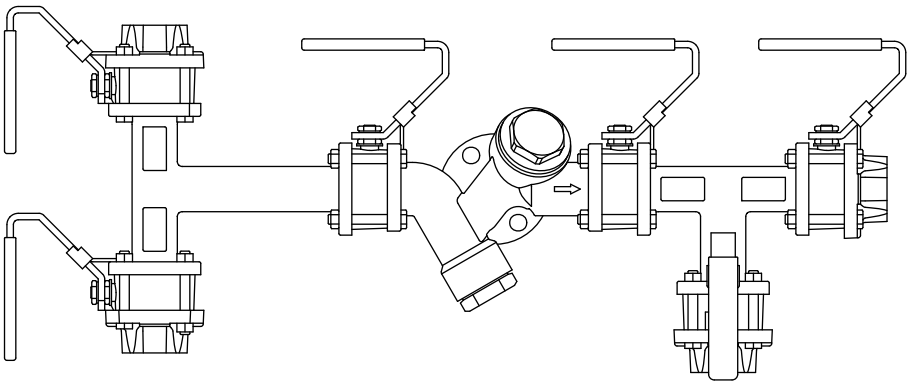
Double Block and Bleed Upstream Horizontal (DBB USH)



Double Block and Bleed Upstream Horizontal Downstream Horizontal (DBB USH DSH)



Double Block and Bleed Upstream Vertical (DBB USV)



Double Block and Bleed Upstream Vertical Downstream Horizontal (DBB USV DSH)

The DBB (Double Block and Bleed) variation provides enhanced safety and possibility to drain the steam trapped between the isolation valves by adding a T shaped connection.

The STS17.2 trapping solution incorporates Spirax Sarco quickfit technology, which allows speedy trap maintenance. The following swivel connector steam traps (sold separately) can be used with this pipeline connector enabling it to be tailored to suit any application:

- **UTD26** and **UTD52** thermodynamic steam traps.
- **UBP32** balanced pressure steam trap.
- **USM** bimetallic steam trap.
- **UFT32** ball float steam trap.
- **UIB30** and **UIB30H** inverted bucket steam traps.

Standards

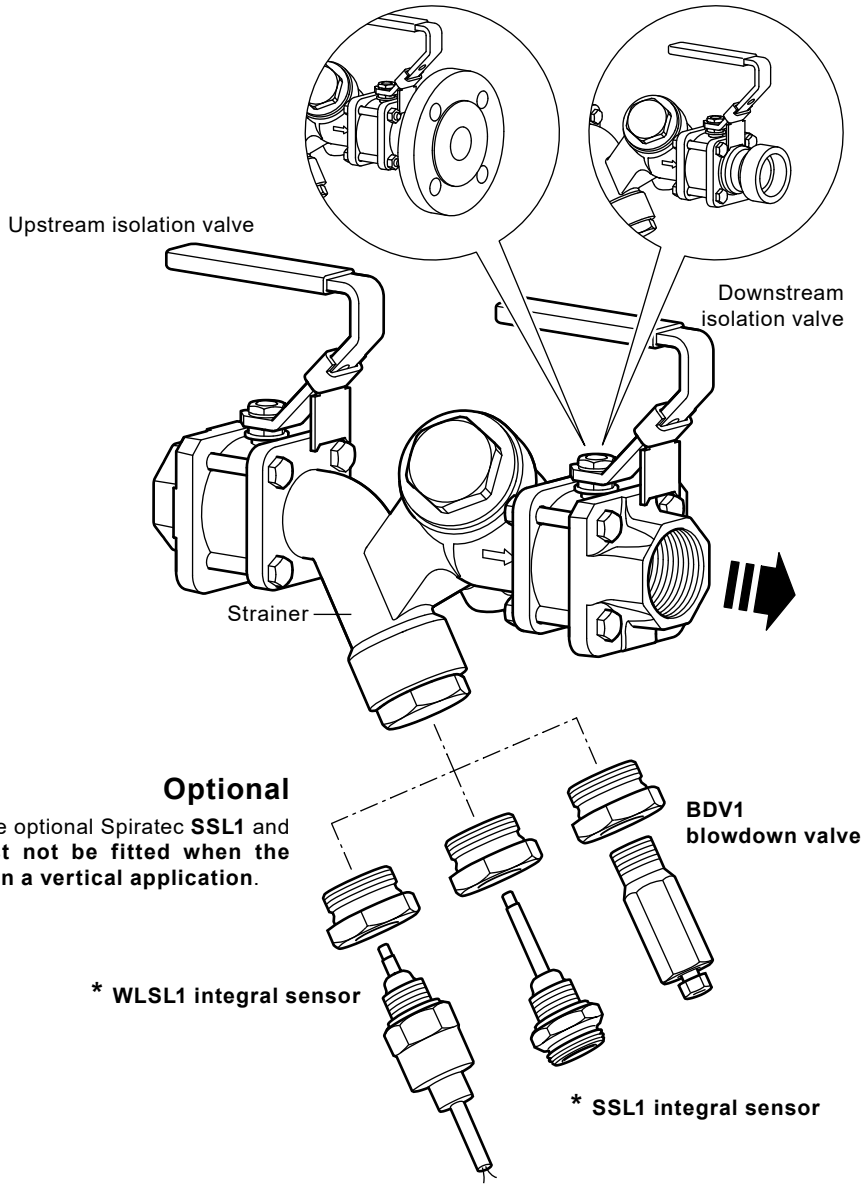
These products fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

These products are available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.
For other certification contact Spirax Sarco.

Sizes and pipe connections

½", ¾" and 1" screwed BSP T Rp (ISO 7-1), NPT or socket weld.
½", ¾" and 1" ASME 150 and ASME 300.
DN15, DN20 and DN25 flanged EN 1092 PN40.



Optional

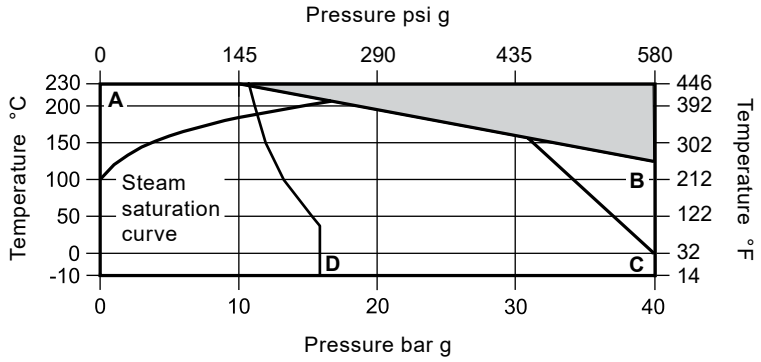
* **Please note** that the optional Spiratec **SSL1** and **WLSL1** sensors **must not be fitted when the STS17.2 is installed in a vertical application**.

Optional extras

Integral sensor type SSL1 (steam only) **or WLSL1** (for waterlogging) for use with R1C **or WLSL1 with DIODE** for use with RI6C are available as optional extras, to enable operational monitoring of the steam trap. **Please note** that the optional Spiratec **SSL1** and **WLSL1** sensors **must not be fitted when the STS17.2 is installed in a vertical application**.

BDV1 blowdown valve is also available for cleaning the strainer during operation. Care should be taken when using the BDV1 blowdown valve as the discharge may be hot. Please note that a BDV1 cannot be used when a Spiratec sensor has been chosen to be part of the unit.
Retrofit double isolation valve and spool piece to convert a single upstream isolation version to double isolation.
Insulation jacket is available to reduce heat loss and energy wastage. See separate literature.

Pressure / temperature limits



The product **must not** be used in this region.

A - B Screwed, socket weld, butt weld and flanged ANSI 300.

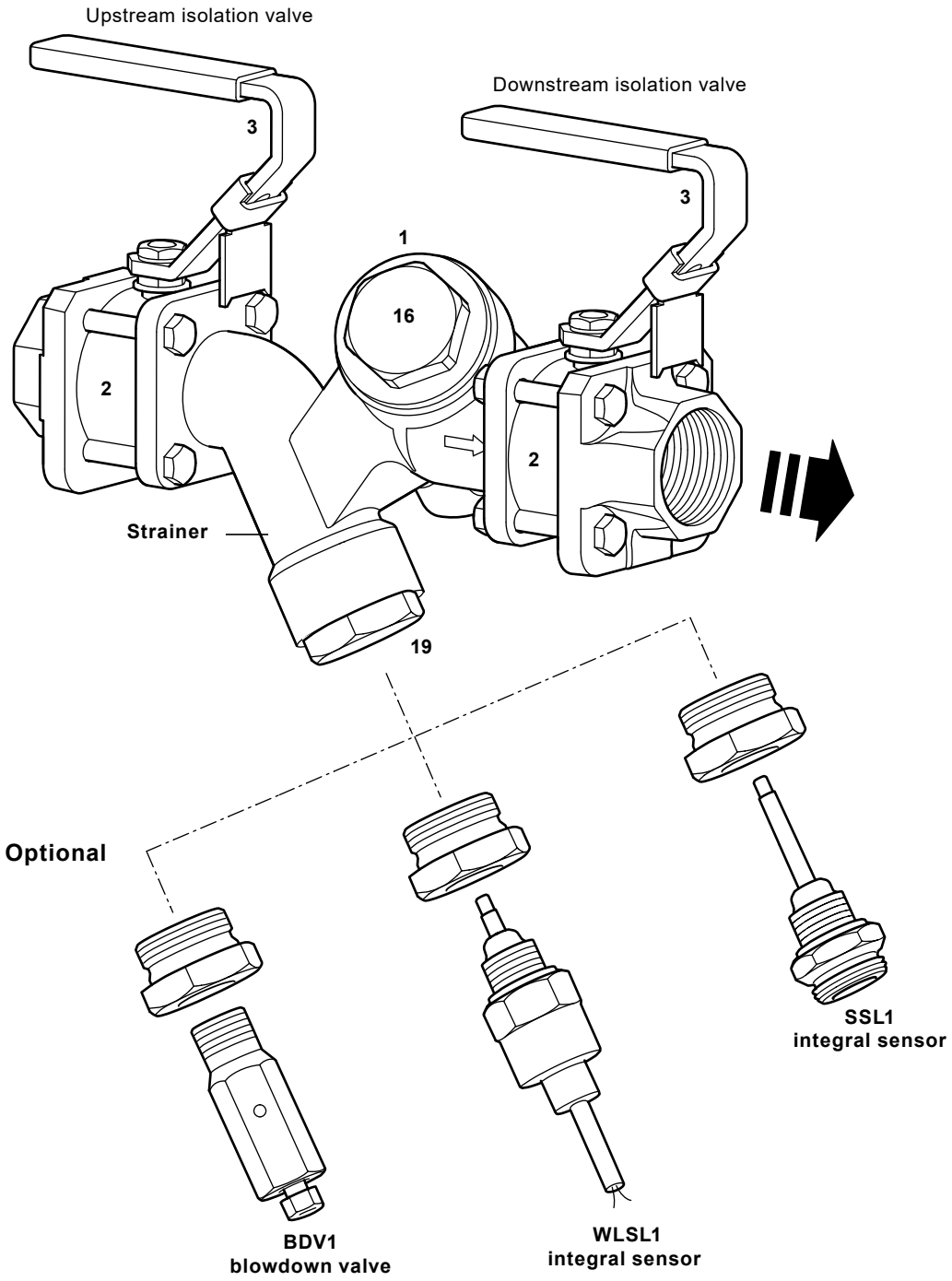
A - C Flanged EN 1092 PN40.

A - D Flanged ASME Class 150.

Body design conditions				PN40
PMA	Maximum allowable pressure		40 bar g @ 120 °C	580 psi g @ 248 °F
TMA	Maximum allowable temperature		230 °C @ 10 bar g	446 °F @ 145 psi g
Minimum allowable temperature			-10 °C	14 °F
PMO	Maximum operating pressure for saturated steam service	ANSI 150	11.3 bar g	164 psi g
		All other connections	17.5 bar g	254 psi g
TMO	Maximum operating temperature		230 °C @ 10 bar g	446 °F @ 145 psi g
Minimum operating temperature			-10 °C	14 °F
Note: For lower operating temperatures consult Spirax Sarco				
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of:			60 bar g	870 psi g

Materials

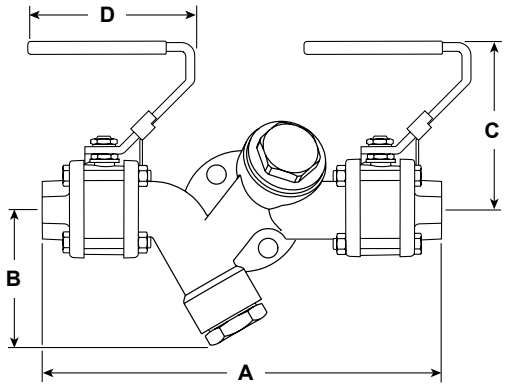
STS17.2 version with single isolation



No.	Part	Material	
1	Body	Stainless steel	ASTM A351 Gr. CF8
2	Isolation ball valves	Stainless steel	ASTM A182 F316L
3	Handle	Stainless steel	AISI 316
16	Check valve blanking plug	Stainless steel	ASTM A276 431
19	Strainer cap	Stainless steel	ASTM A582 416

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

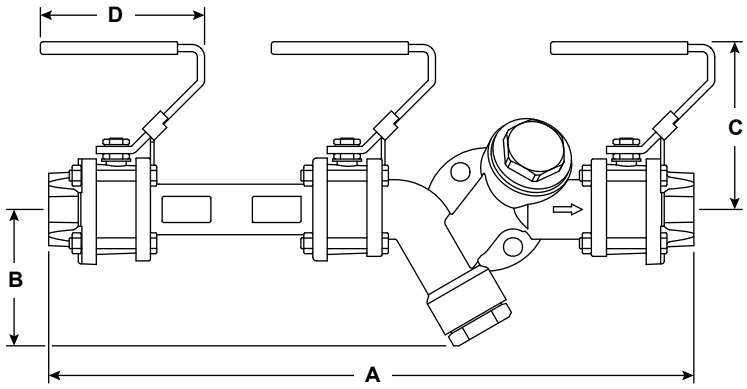
Single Isolation (SB)



Isolation	Size and connection	Dimension				Weight
		A	B	C	D	
Single	½" BSP T Rp (ISO 7-1), ½" NPT and ½" SW	222 (8.74)	76 (3.0)	93 (3.7)	90 (3.5)	3.60 (7.94)
	¾" BSP T Rp (ISO 7-1) and ¾" NPT					3.53 (7.78)
	¾" SW	213 (8.39)				3.54 (7.80)
	1" BSP T Rp (ISO 7-1) and 1" NPT	229 (9.02)				3.71 (8.18)
	1" SW	269 (10.6)				3.86 (8.51)
	½" ASME 150	268 (10.55)				4.45 (9.81)
	½" ASME 300	294 (11.6)				4.98 (11.0)
	DN15 EN 1092 PN40	284 (11.2)				5.12 (11.3)
	¾" ASME 150	272 (10.7)				4.67 (10.3)
	¾" ASME 300	306 (12.05)				5.98 (13.2)
	DN20 EN 1092 PN40	304 (12.0)				5.74 (12.7)
	1" ASME 150	271 (10.67)				4.96 (10.9)
	1" ASME 300	309 (12.2)				6.64 (14.6)
	DN25 EN 1092 PN40	304 (12.0)				6.24 (13.8)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

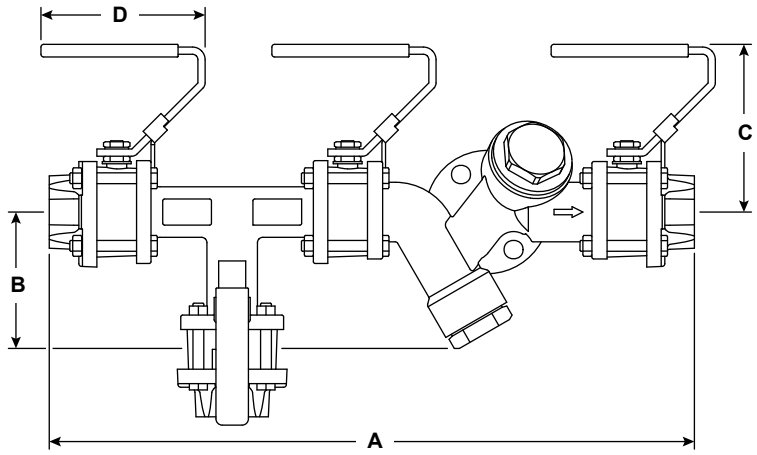
Double Isolation Upstream (DB US)



Isolation	Size and connection	Dimension				Weight
		A	B	C	D	
Double	½" BSP T Rp (ISO 7-1), ½" NPT and ½" SW	350 (13.8)	76 (3.0)	93 (3.7)	90 (3.5)	5.32 (11.7)
	¾" BSP T Rp (ISO 7-1) and ¾" NPT					5.25 (11.57)
	¾" SW	341 (13.4)				5.26 (11.6)
	1" BSP T Rp (ISO 7-1) and 1" NPT	357 (14.1)				5.43 (12.0)
	1" SW	397 (15.63)				5.58 (12.3)
	½" ASME 150	396 (15.6)				6.17 (13.6)
	½" ASME 300	422 (16.6)				6.70 (14.8)
	DN15 EN 1092 PN40	412 (16.2)				6.84 (15.1)
	¾" ASME 150	400 (15.7)				6.39 (14.1)
	¾" ASME 300	434 (17.1)				7.70 (17.0)
	DN20 EN 1092 PN40	432 (17.0)				7.46 (16.4)
	1" ASME 150	399 (15.71)				6.68 (14.7)
	1" ASME 300	437 (17.2)				8.36 (18.4)
	DN25 EN 1092 PN40	432 (17.0)				7.97 (17.6)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

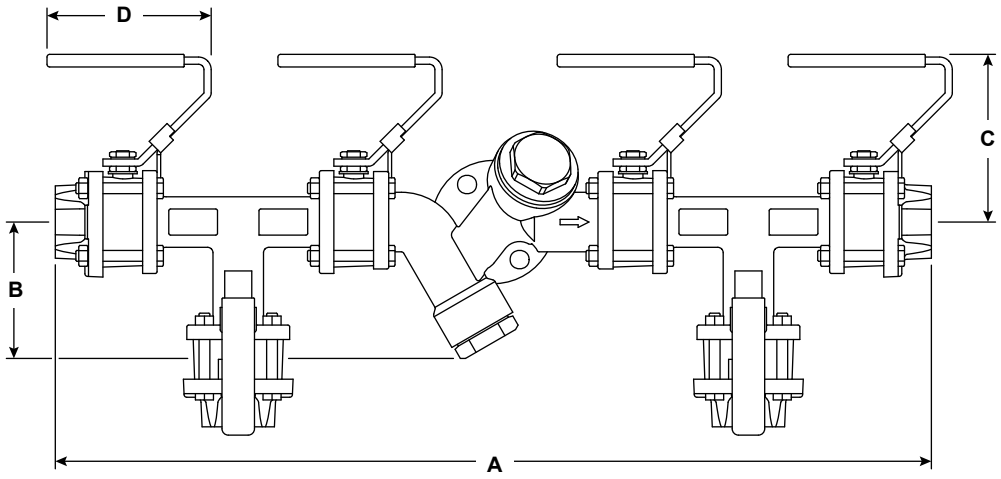
Double Block and Bleed Upstream Horizontal (DBB USH)



STS17.2 type	Size and connection		Dimension				Weight
			A	B	C	D	
DBB USH	½"	BSP T Rp (ISO 7-1)	351 (13.8)	118 (4.65)	93 (3.7)	90 (3.5)	6.37 (14.0)
DBB USH	½"	NPT					
DBB USH	½"	SW					6.67 (14.7)
DBB USH	½"	ASME 150	397 (15.6)	141 (5.55)			9.77 (21.5)
DBB USH	½"	ASME 300	423 (16.7)	154 (6.06)			10.9 (24.0)
DBB USH	½"	PN40	413 (16.3)	149 (5.87)			11.04 (24.3)
DBB USH	¾"	BSP T Rp (ISO 7-1)	351 (13.8)	118 (4.65)			6.37 (14.0)
DBB USH	¾"	NPT					
DBB USH	¾"	SW	342 (13.5)				6.67 (14.7)
DBB USH	¾"	ASME 150	401 (15.8)	143 (5.63)			9.77 (21.5)
DBB USH	¾"	ASME 300	435 (17.1)	160 (6.30)			10.9 (24.0)
DBB USH	¾"	PN40	433 (17.0)	159 (6.26)			11.04 (24.3)
DBB USH	1"	BSP T Rp (ISO 7-1)	358 (14.1)	118 (4.65)			6.52 (14.4)
DBB USH	1"	NPT					
DBB USH	1"	SW	398 (14.1)	138 (5.43)			6.82 (15.0)
DBB USH	1"	ASME 150	400 (15.7)	139 (5.47)			10.07 (22.2)
DBB USH	1"	ASME 300	438 (17.2)	158 (6.22)			11.5 (25.4)
DBB USH	1"	PN40	433 (17.0)	156 (6.14)			11.64 (25.7)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

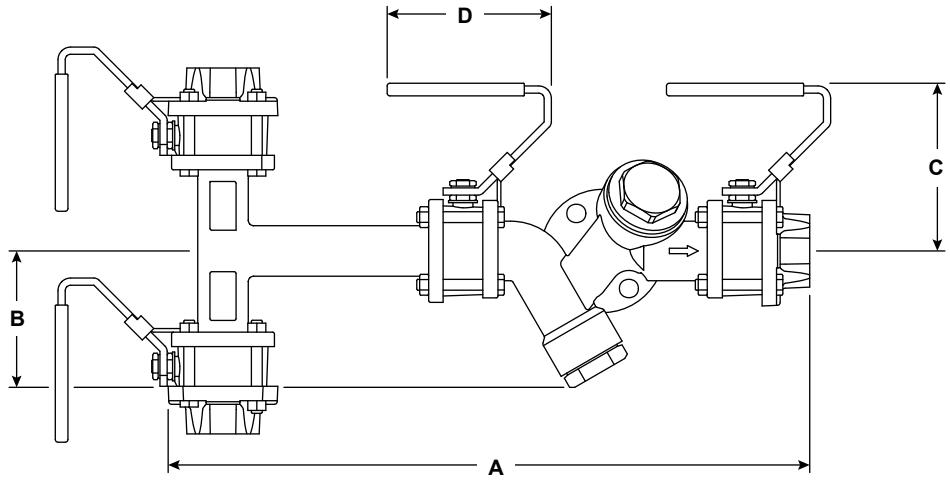
Double Block and Bleed Upstream Horizontal Downstream Horizontal (DBB USH DSH)



STS17.2 type	Size and connection		Dimension				Weight
			A	B	C	D	
DBB USH DSH	½"	BSP T Rp (ISO 7-1)	479 (18.9)	118 (4.65)	93 (3.7)	90 (3.5)	8.64 (19.0)
DBB USH DSH	½"	NPT					8.64 (19.0)
DBB USH DSH	½"	SW					9.04 (19.9)
DBB USH DSH	½"	ASME 150	525 (20.7)	141 (5.55)			12.89 (28.42)
DBB USH DSH	½"	ASME 300	551 (21.7)	154 (6.06)			14.22 (31.35)
DBB USH DSH	½"	PN40	541 21.3)	149 (5.87)			14.36 (31.66)
DBB USH DSH	¾"	BSP T Rp (ISO 7-1)	479 (18.9)	118 (4.65)			8.64 (19.0)
DBB USH DSH	¾"	NPT					
DBB USH DSH	¾"	SW	470 (18.5)				9.04 (19.9)
DBB USH DSH	¾"	ASME 150	529 20.8)	143 (5.63)			12.89 (28.42)
DBB USH DSH	¾"	ASME 300	563 (22.2)	160 (6.30)			14.22 (31.35)
DBB USH DSH	¾"	PN40	561 (22.1)	159 (6.26)			14.36 (31.66)
DBB USH DSH	1"	BSP T Rp (ISO 7-1)	486 (19.1)	118 (4.65)			8.84 (19.5)
DBB USH DSH	1"	NPT					
DBB USH DSH	1"	SW	526 (20.7)	138 (5.43)			9.24 (20.4)
DBB USH DSH	1"	ASME 150	528 (20.8)	139 (5.47)			13.29 (29.3)
DBB USH DSH	1"	ASME 300	566 (22.3)	158 (6.22)			15.02 (33.11)
DBB USH DSH	1"	PN40	561 (22.1)	156 (6.14)			15.16 (33.42)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

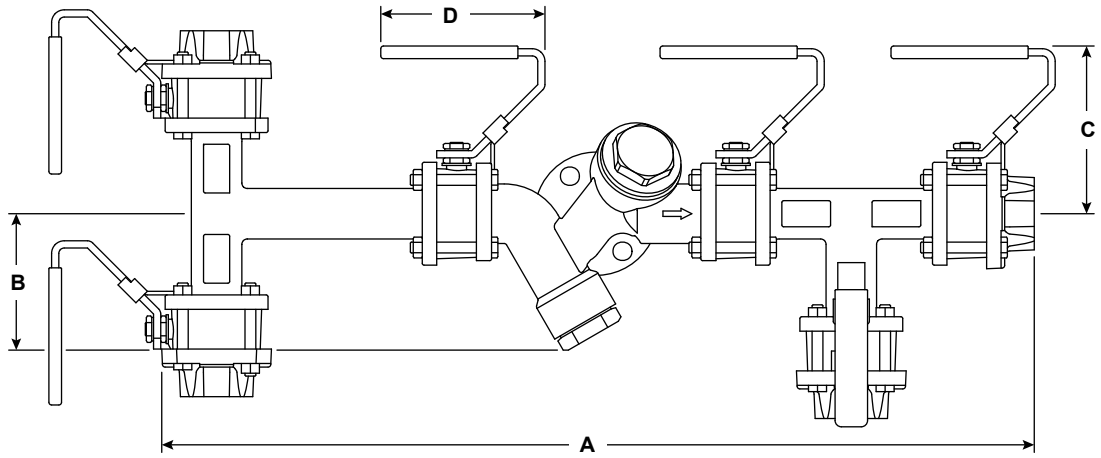
Double Block and Bleed Upstream Vertical (DBB USV)



STS17.2 type	Size and connection		Dimension A	Dimension B	Dimension C	Dimension D	Weight
DBB USV	½"	BSP T Rp (ISO 7-1)	414 (16.3)	106 (4.17)	93 (3.7)	90 (3.5)	6.57 (14.5)
DBB USV	½"	NPT					
DBB USV	½"	SW					6.87 (15.1)
DBB USV	½"	ASME 150	437 (17.2)	129 (17.2)			9.97 (22.0)
DBB USV	½"	ASME 300	450 (17.7)	142 (5.59)			11.1 (24.5)
DBB USV	½"	PN40	445 (17.5)	137 (5.39)			11.24 (24.8)
DBB USV	¾"	BSP T Rp (ISO 7-1)	414 (16.3)	106 (4.17)			6.57 (14.5)
DBB USV	¾"	NPT					
DBB USV	¾"	SW	411 (16.2)	106 (4.17)			6.87 (15.1)
DBB USV	¾"	ASME 150	439 (17.3)	131 (5.16)			9.97 (22.0)
DBB USV	¾"	ASME 300	456 (18.0)	148 (5.83)			11.1 (5.83)
DBB USV	¾"	PN40	455 (17.9)	147 (5.79)			11.24 (24.8)
DBB USV	1"	BSP T Rp (ISO 7-1)	418 (16.5)	106 (4.17)			6.72 (14.8)
DBB USV	1"	NPT					
DBB USV	1"	SW	438 (17.24)	126 (4.96)			7.02 (15.5)
DBB USV	1"	ASME 150	439 (17.3)	127 (5.00)			10.27 (22.64)
DBB USV	1"	ASME 300	458 (18.03)	146 (5.75)			11.7 (25.8)
DBB USV	1"	PN40	456 (18.0)	144 (5.67)			11.84 (26.10)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

Double Block and Bleed Upstream Vertical Downstream Horizontal (DBB USV DSH)



STS17.2 type	Size and connection		Dimension				Weight
			A	B	C	D	
DBB USV DSH	½"	BSP T Rp (ISO 7-1)	542 (21.3)	118 (4.65)	93 (3.7)	90 (3.5)	8.84 (19.5)
DBB USV DSH	½"	NPT					
DBB USV DSH	½"	SW					9.24 (20.4)
DBB USV DSH	½"	ASME 150	565 (22.2)	141 (5.55)			13.09 (28.86)
DBB USV DSH	½"	ASME 300	578 (22.8)	154 (6.06)			14.42 (31.79)
DBB USV DSH	½"	PN40	573 (22.6)	149 (5.87)			14.56 (32.10)
DBB USV DSH	¾"	BSP T Rp (ISO 7-1)	542 (21.3)	118 (4.65)			8.84 (19.5)
DBB USV DSH	¾"	NPT					
DBB USV DSH	¾"	SW	538 (21.2)				9.24 (20.4)
DBB USV DSH	¾"	ASME 150	567 (22.32)	143 (5.63)			13.09 (28.86)
DBB USV DSH	¾"	ASME 300	584 (23.0)	160 (6.30)			14.42 (31.79)
DBB USV DSH	¾"	PN40	583 (22.95)	159 (6.26)			14.56 (32.10)
DBB USV DSH	1"	BSP T Rp (ISO 7-1)	546 (21.5)	118 (4.65)			9.04 (19.9)
DBB USV DSH	1"	NPT					
DBB USV DSH	1"	SW	566 (22.3)	138 (5.43)			9.44 (20.8)
DBB USV DSH	1"	ASME 150	567 (22.32)	139 (5.47)			13.49 (29.74)
DBB USV DSH	1"	ASME 300	586 (23.1)	158 (6.22)			15.22 (33.55)
DBB USV DSH	1"	PN40	584 (23.0)	156 (6.14)			15.36 (33.86)

Spare parts - Double isolation conversion kit

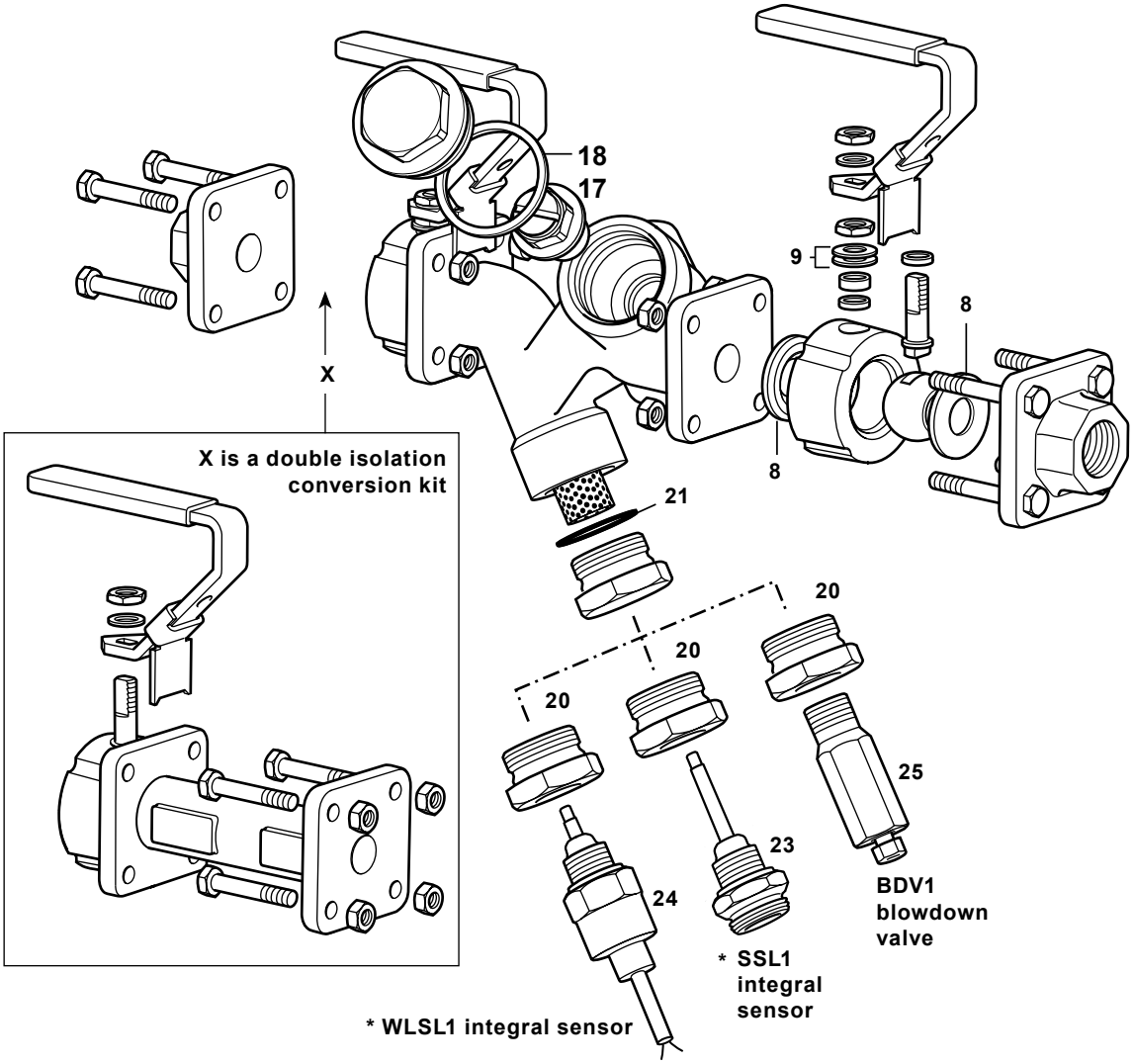
The spare parts are available as indicated below. No other parts are supplied as spares.

Available spares	Isolation ball valve seat and stem seals		**8, 9**
	Strainer screen and gasket		**21, 22**
	Spare sensor and sensor gasket	SSL1 Spiratec sensor	**23**
		WLSL1 diode waterlogging sensor	**24**
	Spiratec retrofit kit	**Note:** State whether an SSL1 or WLSL1 sensor is required.	**20, 21 + 23 or 24**
	Check valve assembly		**17, 18**
	Double isolation conversion kit (includes spool piece and additional isolation valve)		**X**
	BDV1 blowdown valve retrofit kit		**20, 21 + 25**

How to order spares

Always order spares using the description given in the column headed 'Available spares' and state the size and model number.

Example: 1 - 1 off Spare Spiratec sensor and sensor gasket with WLSL1 diode waterlogging sensor for a ½" STS17.2 compact pipeline connector steam trapping station.



Spare parts - Double Block and Bleed conversion kit

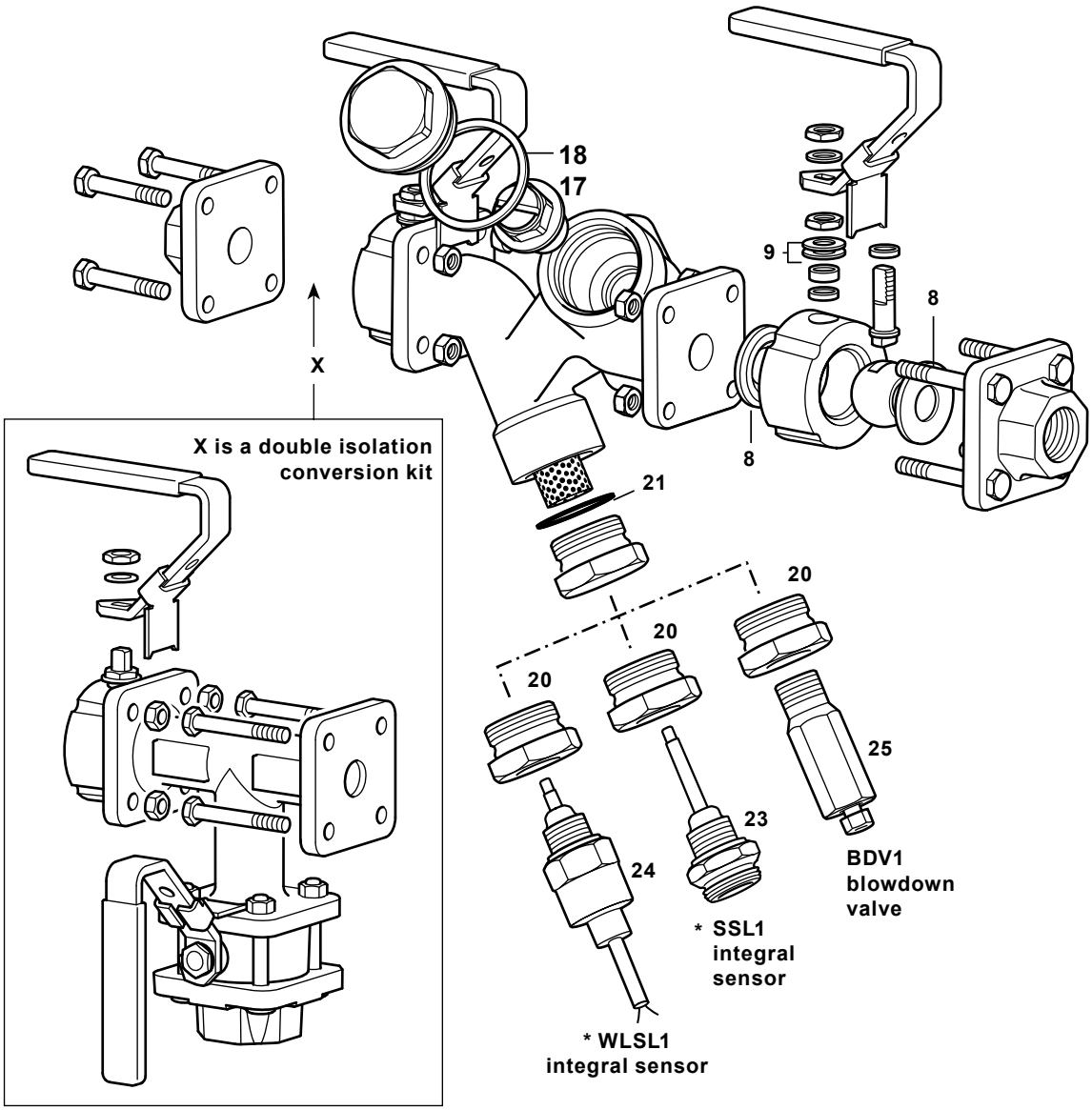
The spare parts are available as indicated below. No other parts are supplied as spares.

Available spares	Isolation ball valve seat and stem seals		**8, 9**
	Strainer screen and gasket		**21, 22**
	Spare sensor and sensor gasket	SSL1 Spiratec sensor	**23**
		WLSL1 diode waterlogging sensor	**24**
	Spiratec retrofit kit	**Note:** State whether an SSL1 or WLSL1 sensor is required.	**20, 21 + 23 or 24**
	Check valve assembly		**17, 18**
	Double Block and Bleed conversion kit (includes spool piece, connectors additional isolation valves and their bolts/studs/nuts)		**X**
	BDV1 blowdown valve retrofit kit		**20, 21 + 25**

How to order spares

Always order spares using the description given in the column headed 'Available spares' and state the size and model number.

Example: 1 - 1 off Spare Spiratec sensor and sensor gasket with WLSL1 diode waterlogging sensor for a ½" STS17.2 compact pipeline connector steam trapping station.



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P128-23) supplied with the product.

How to order

Example: 1 off Spirax Sarco ½" screwed BSP T Rp (ISO 7-1) STS17.2 stainless steel pipeline compact connector steam trapping station, having a Spiratec SSL1 sensor.

How to order*

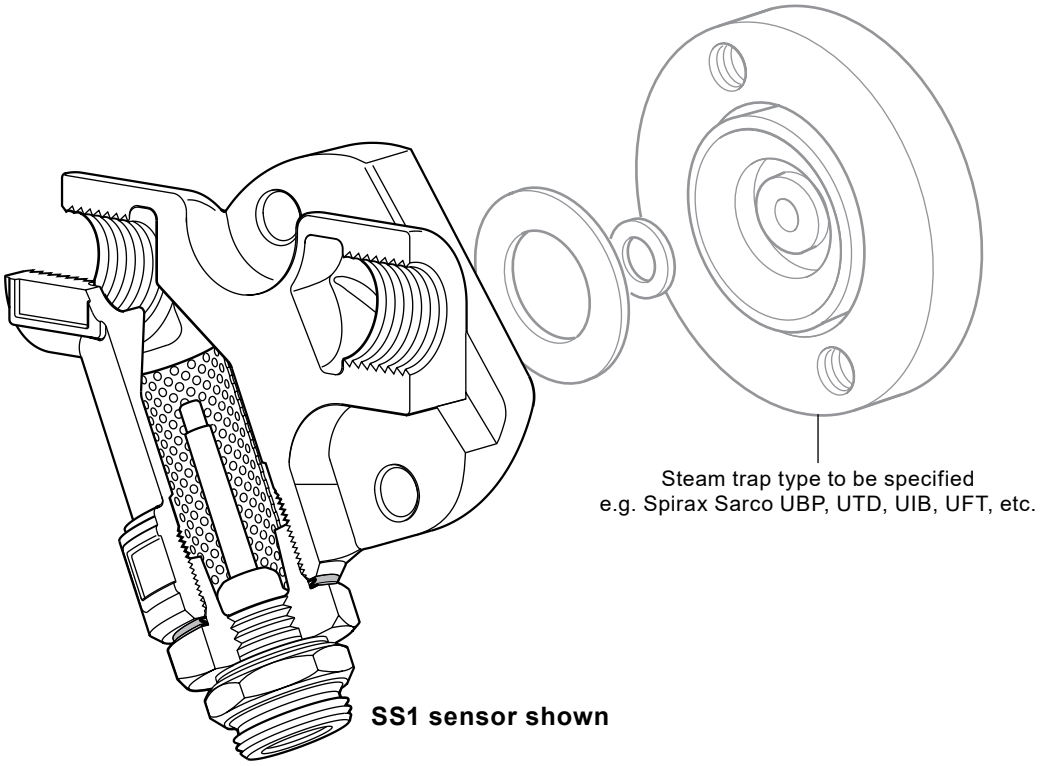
Product Description	**STS17.2**	Steam trapping station
Connection size	**1/2"**	Ø1/2" Connection
	3/4"	Ø3/4" Connection
	1"	Ø1" Connection
Connection type	**BSP**	BSP T Rp (ISO 7-1) Threaded (both ends)
	NPT	NPT Threaded (both ends)
	SW	Socket Weld (both ends)
	ASME 150	ASME B16.5 Cl.150 (both ends)
	ASME 300	ASME B16.5 Cl.300 (both ends)
	PN40	BS EN 1092-1 (both ends)
Isolation quantity	**SB**	Single Isolation
	DB	Double Isolation
	DBB	Double Block and Bleed
Upstream connection orientation	**US**	Upstream (only used for DB)
	USH	Upstream Horizontal (Only used for DBB)
	USV	Upstream Vertical (Only used for DBB)
Downstream connection orientation**	**DSH**	Downstream Horizontal (Only used for DBB)

* These combinations are Spirax Sarco standard, for any other combination or special item addition please get in touch.

** This cell will be left blank when the intention is to not have any downstream connection.

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IPC20 and IPC21 Pipeline Connectors with Integral Spiratec Sensors



SS1 sensor shown

Description

The **IPC20** is a pipeline connector with integral strainer and Spiratec sensor for use with UTD52L, UTD52H, UTD26, UTD26Y, UBP21 and UBP32 steam traps.
The **IPC21** is a pipeline connector with an integral strainer and Spiratec sensor for use with UIB30, UIB30H, UFT14 and UFT32 steam traps.
Both the **IPC20** and **IPC21** can be fitted with the following sensor options:

SS1 sensor - for detection of steam leakage.

WLS1 sensor with diode - for use with R16C monitor to detect steam wastage and waterlogging.

WLS1 sensor without diode - for use with R1C to detect steam wastage and waterlogging.

Standards

These products fully comply with the requirements of the Pressure Equipment Directive (PED).

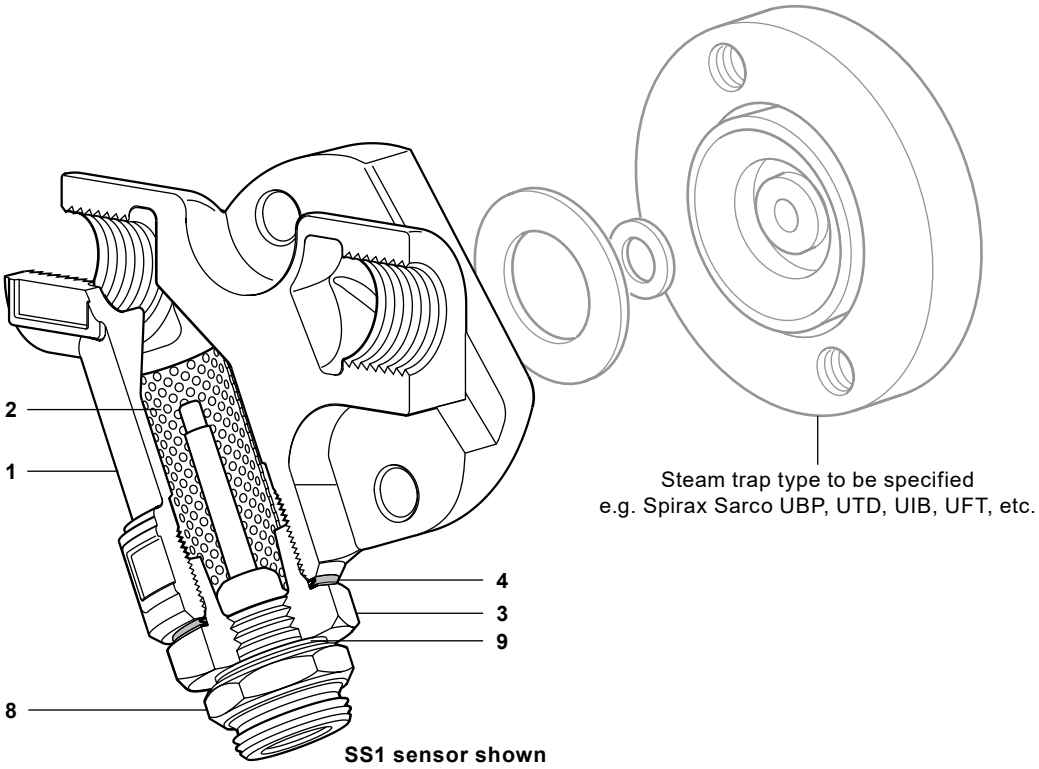
Certification

These products are available with certification to EN 10204 2.2.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

Condensate inlet/outlet DN15, 20 and 25 (½", ¾" and 1")
Screwed BSP, NPT
Socket weld ends to ANSI B 16.11/BS 3799 Class 3000.

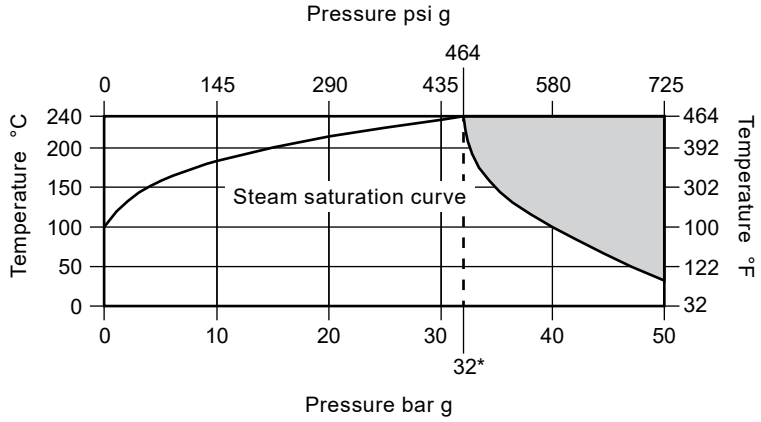
Materials



SS1 sensor shown

No.	Part	Material	
1	Body	Austenitic stainless steel	ASTM A 351 CF8
2	Strainer screen	Austenitic stainless steel (0.8 mm perforations)	316L
3	Strainer cap	Austenitic stainless steel	AISI 303
4	Cap gasket	Stainless steel	BS 1449 304 S16
8	Sensor	Stainless steel	ASTM A582 416
9	Sensor gasket	Stainless steel	

Pressure/temperature limits

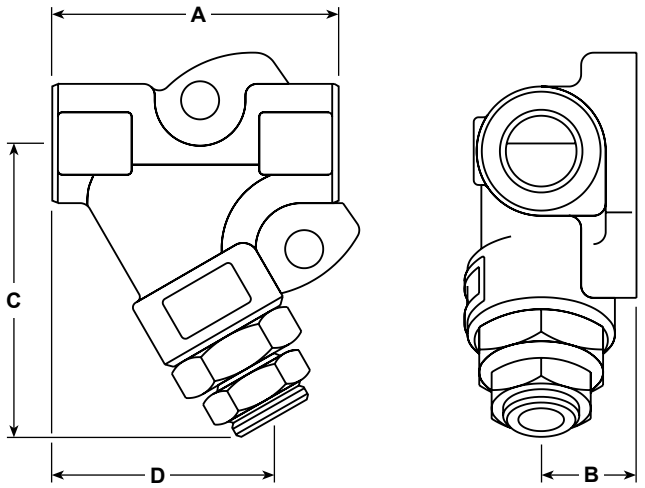


The product **must not** be used in this region.

*PMO Maximum operating pressure recommended for saturated steam service

Body design conditions		ANSI/ASME Class 300 (PN50)	
PMA	Maximum allowable pressure	50 bar g	725 psi g
TMA	Maximum allowable temperature	240 °C	464 °F
PMO	Maximum operating pressure for saturated steam service	32 bar g	464 psi g
TMO	Maximum operating temperature	240 °C	464 °F
Designed for a maximum cold hydraulic test pressure of:		76 bar g	1,102 psi g

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	A	B	C	D	Weight
DN15 (½")	81 (3.2)	24 (0.94)	127 (5)	58 (2.3)	1.20 (2.65)
DN20 (¾")	89 (3.5)	24 (0.94)	127 (5)	64 (2.5)	1.30 (2.87)
DN25 (1")	99 (3.9)	25 (0.98)	132 (5.2)	69 (2.7)	1.50 (3.31)

Kv values

Size	DN15 (½")	DN20 (¾")	DN25 (1")
Kv	1.1	1.1	1.1

For conversion:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P128-11) supplied with the product.

General information

There are two criteria which must be satisfied to ensure that the swivel connector trap will operate correctly and ensure effective condensate removal:

- The IPC20 and IPC21 must be installed in a horizontal pipeline with the sensor at the bottom.
- The connection face for the swivel connector steam trap must always be in the vertical plane unless stated on relevant steam trap Installation and Maintenance Instructions.

After installation it is recommended that the pipeline connector is insulated to minimise radiated heat losses and to protect personnel from burn risk.

Detailed instructions regarding welding socket weld versions are provided with the product.

Disposal

This product is recyclable. No ecological hazard is anticipated with disposal of this product providing due care is taken.

How to order

Example: 1 off ½" Spirax Sarco IPC21 pipeline connector with socket weld connections fitted with an integral strainer screen and SS1 Spiratec sensor for steam wastage detection.

Spare parts

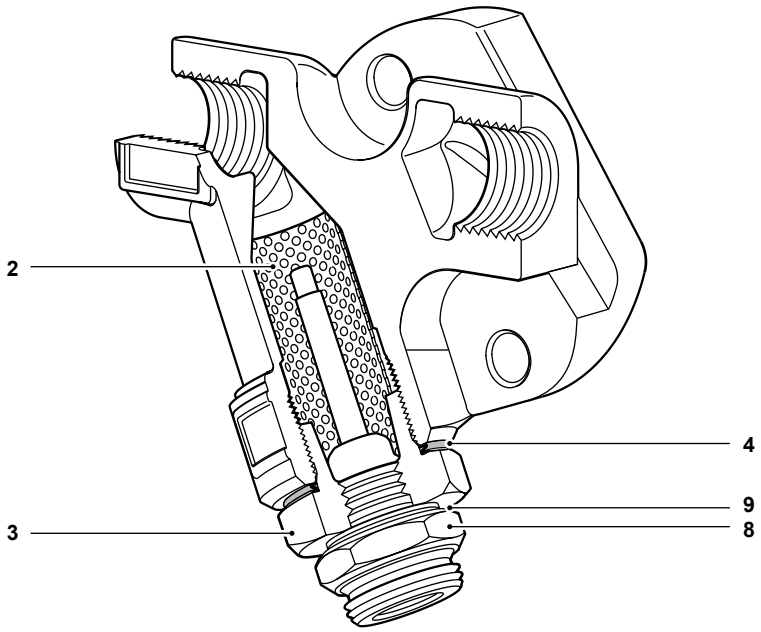
The spare parts available are detailed below. No other parts are supplied as spares.

Available spares

Strainer screen and gasket	**2**, **4**
Sensor and sensor gasket	**8, 9**

How to order spares

Always order spares using the description given in the column headed 'Available spares' and state the size and model number.
Example: 1 - Strainer screen and gasket for the ½" IPC20 connector.



Recommended tightening torques

Item	 or mm 		N m	ft lbf
3	32 A/F	M28 x 1.5P	170 - 190	125 - 140
8	24 A/F		50 - 55	37 - 41

TI-P017-12-US
Issue 2

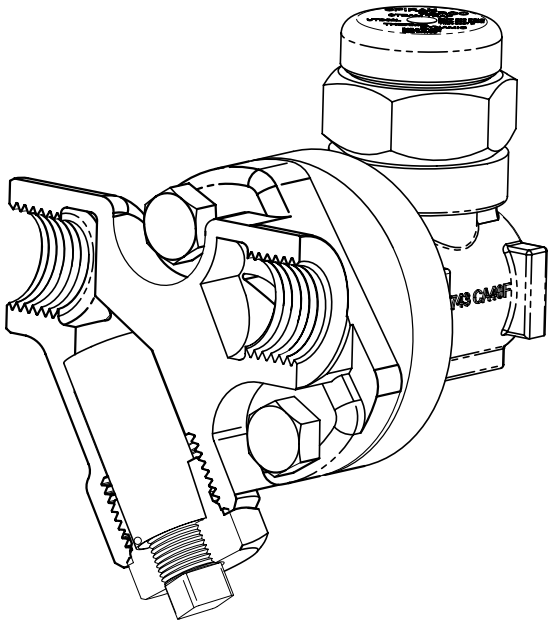
UTD52 Series
Universal Thermodynamic Steam Trap (for use with Universal Connector)

Description

The Thermodynamic steam trap cycles periodically to discharge condensate very near to steam temperature. It is unaffected by waterhammer or superheat. The UTD is a unique solution to maintain the disc in the horizontal plane by means of a universal connector. The trap is easily replaced or removed for servicing without disturbing the pipe connections.

Model	UTD52L, UTD52H, UTD52L-HP UTD52SL, and UTD52SH
PMO	450 psi g/600 psi g (31 bar g/ 41 bar g) HP model
Trap construction	Stainless Steel
Trap options	Slotted disc
Connector sizes	½", ¾", 1"
Connector connections	NPT, SW
Connector construction	Straight or strainer type (left or right hand)
	Stainless steel or cast steel
Connector options	SW connections to ANSI B16.11
	Carbon steel
	USTSII trap station

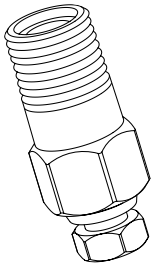
Standard Strainer Connector shown
(Connector of choice sold separately)
See TI-P127-03-US.

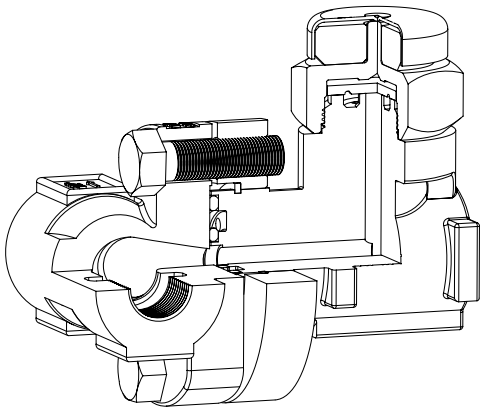


Note: Left Hand Strainer Connector Style is mirror image.

Optional Blowdown Valve for strainer connector

Standard on UTD52S models





Limiting operating conditions

Maximum Operating Pressure (PMO)	450 psi g	(31 bar g)	Standard
	600 psi g	(41 bar g)	UTD52L-HP
Maximum Operating Temperature	750 °F	(400 °C)	
Pressure Range	3.5 to 450 psi g	(0.24 to 31 bar g)	UTD52L, UTD52H, UTD52SL, UTD52SH
	300 to 600 psi g	(21 to 41 bar g)	UTD52L-HP
Maximum back pressure should not exceed 80% of the upstream pressure			

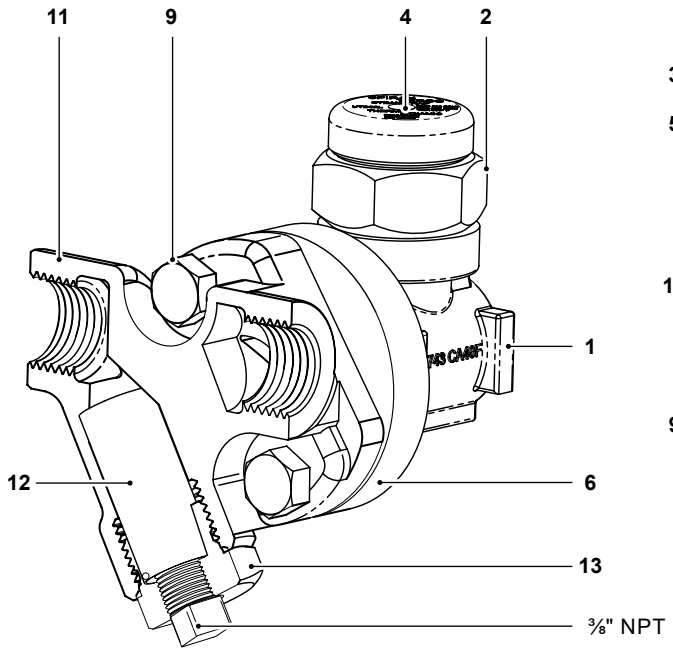
Pressure shell design conditions

PMA	Maximum allowable pressure	720 psi g/up to 100 °F	(50 bar g/up to 38 °C)	- ALL
		450 psi g/750 °F	(31 bar g/238-400 °C)	- Standard
		600 psi g/750 °F	(41 bar g/400 °C)	- UD52L-HP
TMA	Maximum allowable temperature	750 °F/0-450 psi g	(400 °C/0-31 bar g)	- Standard
		750 °F/600 psi g	(400 °C/41 bar g)	- UTD52L-HP
Designed for a maximum cold hydraulic test pressure of		1080 psi g.	(74.5 bar g)	

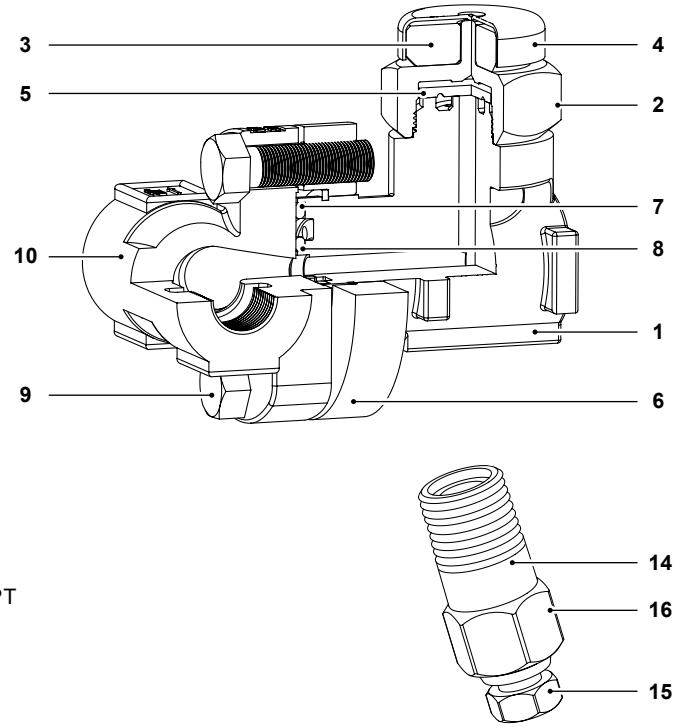
Typical applications

Steam main drainage, and steam tracing and constant pressure/constant load applications.

Materials



Note: Left Hand Strainer Connector Style is mirror image.



Optional Blowdown Valve for strainer connector

Standard on UTD52S models

No.	Part	Material	
1	Body	Stainless Steel	ASTM A743 Gr.CA40
2	Cap	Stainless Steel	ASTM A743 Gr.CA40
3	Insulator	Ceramic	
4	Cover/Nameplate		
5	Disc	Stainless Steel	
6	Flange	Stainless Steel	
7	Inner Gasket	Stainless Steel and Exfoliated Graphite Filler	
8	Outer Gasket	Stainless Steel and Exfoliated Graphite Filler	
9	Connector Screws	Alloy Steel (Plated)	ASTM A193 Gr.B7

Standard Connector

10	Connector	Stainless Steel	ASTM A351Gr.CF8

Strainer Connector

No.	Part	Material	
11	Connector	Stainless Steel	ASTM A351 Gr.CF8
12	Strainer Screen	Strainer Screen (.031 perf)	
13	Strainer Cap	Stainless Steel	AISI 303

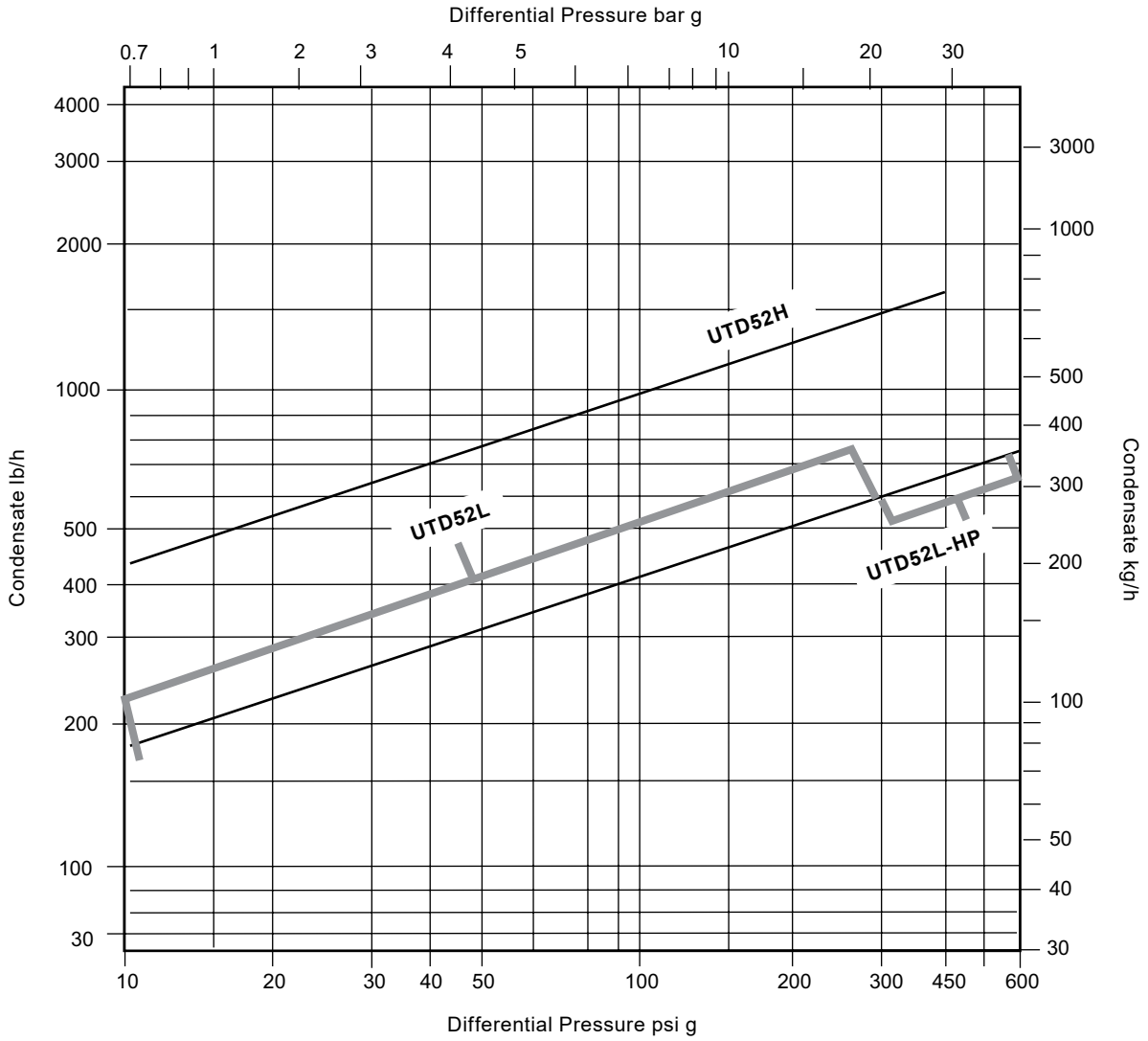
Strainer Connector or UTD52S

14	Blowdown Ball Head (Internal)	Stainless Steel	AISI 440
15	Blowdown Valve Stem	Stainless Steel	AISI 431
16	Blowdown Valve Body	Stainless Steel	AISI 303

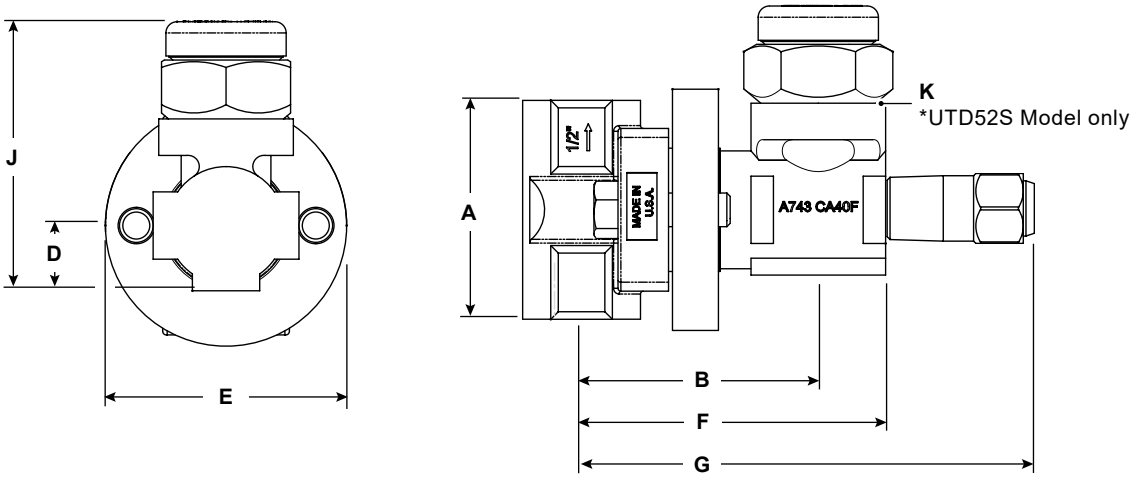
* Consult factory for material specifications in carbon steel connectors.

** UTD52L body and cap is electroless nickel plated (ENP) in accordance with ASTM B733, Service Condition SC2.

Capacities


Differential Pressure bar g
0.7
1
2
3
4
5
10
20
30
4000
3000
2000
1000
500
400
300
200
100
30
Condensate lb/h
UTD52H
UTD52L
UTD52L-HP
3000
1000
500
400
300
200
100
50
40
30
Condensate kg/h
10
20
30
40
50
100
200
300
450
600
Differential Pressure psi g

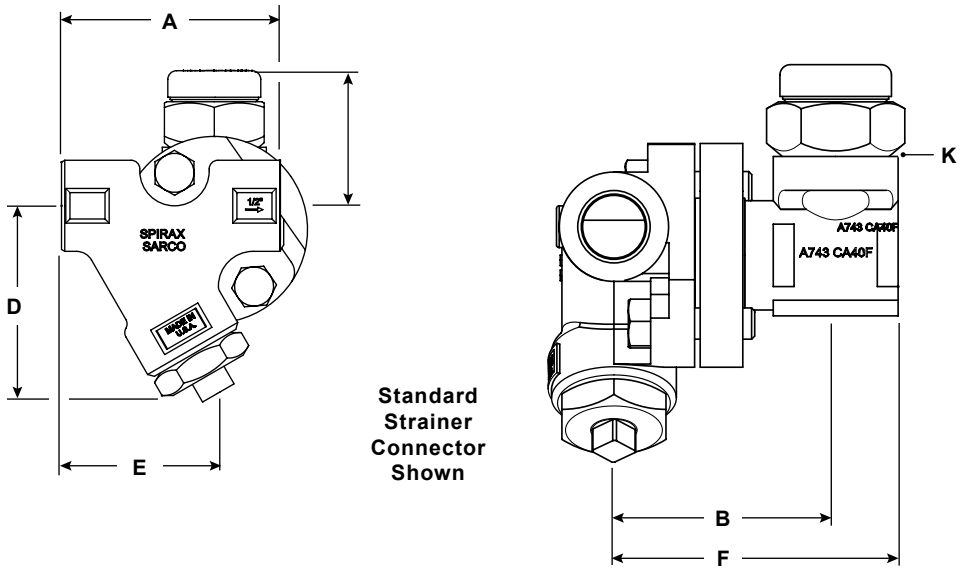
Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Standard Straight Connector UTD52 or UTD52S Models

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
½"	2.4 (61)	2.7 (69)	3.0 (76.2)	2.4 (61)	2.5 (63.5)	0.7 (17.8)	2.6 (66)	3.3 (84)	3.8 (97)	5.1 (130)	5.4 (137)	0.4 (10.2)	0.4 (10.2)	3.3 lb (1.5 kg)
¾"	2.9 (74)												0.5 (12.7)	
1"	3.5 (89)													3.7 lb (1.7 kg)

* UTD52S Model only



Size Standard and Left Hand Connector

	A	B (L)	B (H)	C (L)	C (H)	D	E	F (L)	F (H)	K(L)	K(H)	Weight
½"	3.2 (81.3)	2.7 (69)	3.0 (76.2)	2 (50.8)	2.1 (53.3)	2.9 (73.7)	2.3 (58.4)	3.3 (84)	3.8 (97)	0.4 (10.2)	0.4 (10.2)	3.8 lb (1.7 kg)
¾"	3.5 (88.9)			1.8 (45.7)	1.9 (48.3)	3 (76.2)	2.5 (63.5)				0.5 (12.7)	4.2 lb (1.9 kg)
1"	3.9 (99.1)			1.6 (40.6)	1.7 (43.2)	3.1 (78.7)	2.7 (68.6)	3.4 (84)			0.5 (12.7)	4.5 lb (2.0 kg)

Sample Specification

Steam trap shall be supplied with a pipeline connector which, once installed, remains in the line permanently. Trap shall be attached to the connector by two bolts to enable simple and rapid installation and replacement. The connection is designed to allow installation on pipework that is vertical, horizontal, or any angle in between. Operation shall be on/off discharge with tight shut off and no bleed or "controlled" leak, with back pressures up to 80% of inlet pressure. When specified, the connector shall be provided with integral "Y" pattern strainer with or without integral blowdown valve, standard or left hand pattern. The trap itself shall be Thermodynamic disc type of stainless steel construction and integral seat design with hardened disc and seating surface. Cap to have integral ceramic insulator with stainless steel cover.

Determining whether you need Standard Strainer Connector or Left Hand

Because of location or space constraints, when straddling the pipe facing in the direction of flow the standard strainer connector with the trap body facing the left side with bolt on the right. The left hand connector will have the trap body on the right with the bolts on the left.

Installation

The connector can be installed in horizontal or vertical lines. The connector face must be in a vertical plane. The trap should be fitted to the connector with its cap uppermost. Full-port isolating valves should be installed upstream and downstream of the connector.

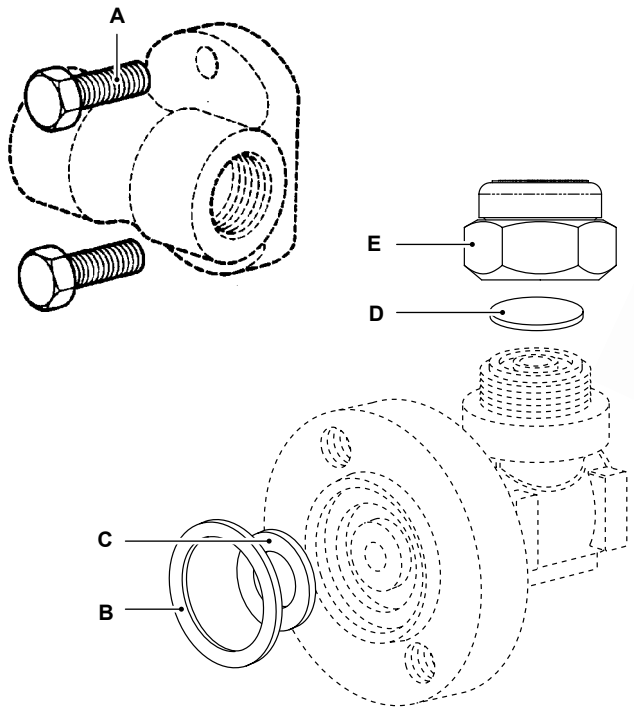
Maintenance

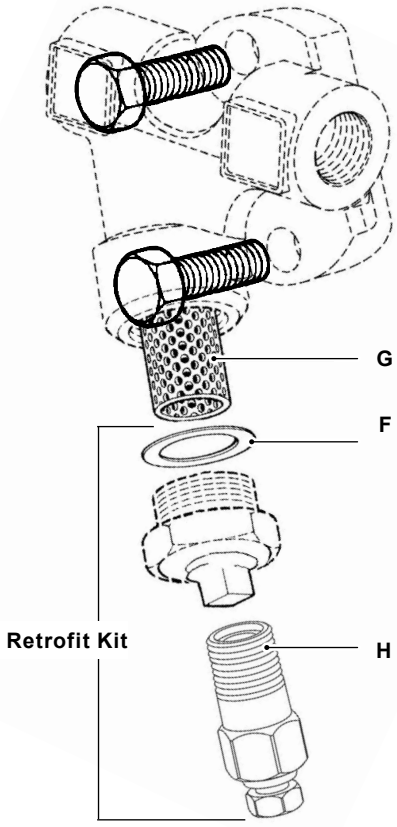
The trap can be removed for repair or replacement without disturbing the connector piping connections. Complete isolation of the connector from both supply and return line is required before the trap is removed. The trap should be removed from the connector and disassembled periodically for inspection and cleaning of the disc and seat. Complete installation and maintenance instructions are given in the IM-2-5161-US, which accompanies the product.

Spare Parts

Available spare parts are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Connector Screw and Gasket Set	**A, B, C**
Disc	**D**
Cap Assy	**E**
Strainer Screen	**G**
Blowdown Valve	**H**
Strainer Cap Gasket	**F**





TI-P146-05
CMGT Issue 7

UFT32

Sealed Stainless Steel Ball Float Steam Trap (for use with Pipeline Connectors)

Description

The UFT32 is an austenitic stainless steel maintenance free sealed ball float steam trap with an integral automatic air venting facility. It is designed for differential steam pressures up to 32 bar (464 psi).
When installed with a suitable pipeline connector the UFT32 can easily and simply be removed without breaking into the pipeline, thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available with screwed, socket weld and flanged end connections.

Capsule

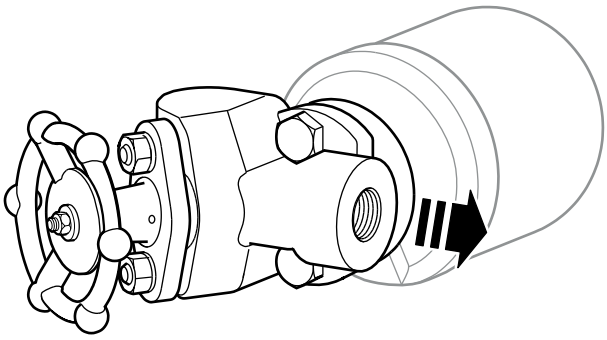
The BP99/32 capsule which is used in the UFT32 is suitable for use on 150 °C (302 °F) superheat @ 0 bar g (0 psi g) and 50 °C (122 °F) superheat @ 32 bar g (464 psi g).

Standards

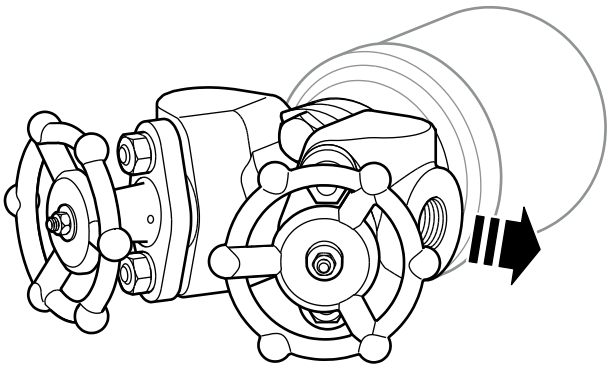
The body to cover welded joint complies with ASME Section IX and BS/EN 288.
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.



UFT32 fitted to a **PC3_** connector



UFT32 fitted to a **PC4_** connector

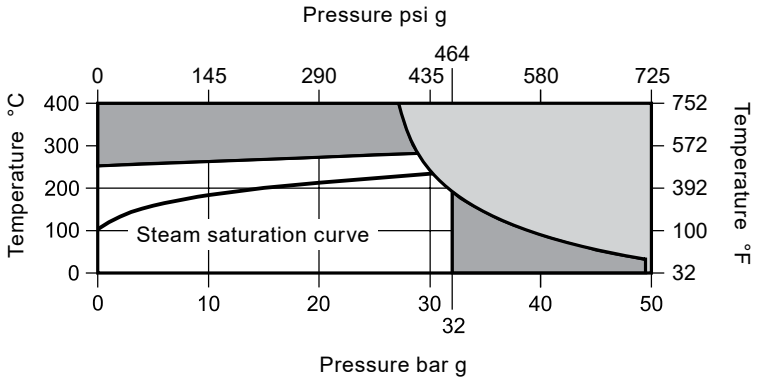
Pipeline connector options

The UFT32 can be fitted to a variety of pipeline connectors including:

PC10HP	Straight connector	ASME 600	(TI-P128-10)
PC20	Straight connector with 'Y' type strainer	ASME 300	(TI-P128-15)
IPC21	Straight connector with 'Y' type strainer and integral Spiratec sensor	ASME 300	(TI-P128-15)
PC3_	Straight connector with one piston isolation valve	ASME 600	(TI-P128-02)
PC4_	Straight connector with two piston isolation valves	ASME 600	(TI-P128-03)
STS17.2	Steam trap station		(TI-P128-22)

See the relevant Technical Information sheet as listed above for details of the connections available for each pipeline connector.

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

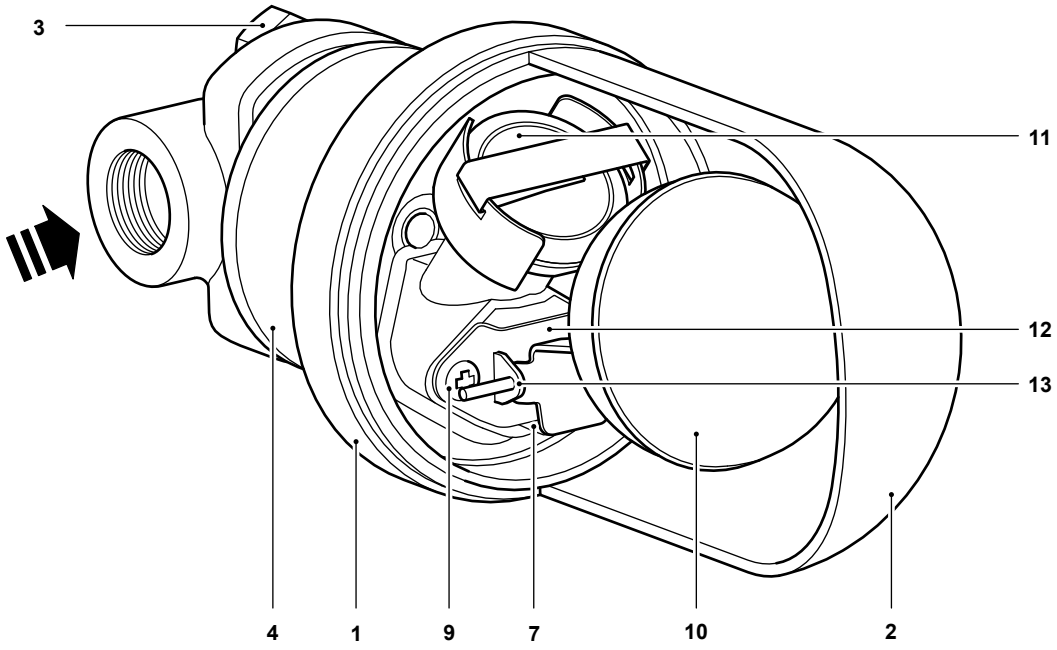
The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Note: The model of pipeline connector and connections selected will dictate the maximum operating limits of the complete assembly. Reference the specific pipeline connector Technical Information sheet as detailed in 'Pipeline connector options'.

Body design conditions				PN50 (ASME 300)
PMA	Maximum allowable pressure		50 bar g @ 38 °C	725 psi g @ 100.4 °F
TMA	Maximum allowable temperature		400 °C @ 28 bar g	752 °F @ 406 psi g
Minimum allowable temperature			-48 °C	-54.4 °F
PMO	Maximum operating pressure for saturated steam service		32 bar g	464 psi g
TMO	Maximum operating temperature		286 °C @ 29 bar g	546.8°F @ 420 [si g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
ΔPMX	Maximum differential pressure	UFT32-4.5	4.5 bar	65.2 psi g
		UFT32-10	10 bar	145 psi g
		UFT32-14	14 bar	203 psi g
		UFT32-21	21 bar	304.5 psi g
		UFT32-32	32 bar	464 psi g
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of:			50 bar g	290 psi g

Materials

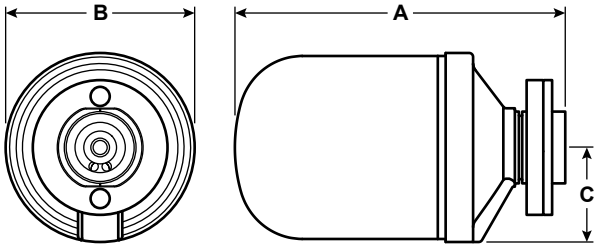
UFT32 fitted to a **PC10HP** connector



No.	Part	Material	
1	Body	Austenitic stainless steel 304	EN 10213-4 1.4308; ASTM A351 CF8
2	Cover	Austenitic stainless steel 304	EN 10028-7 1.4301; ASTM A240 Gr. 304
3	Connector screws	Steel	ASTM A193 B7
4	Flange	Alloy steel - ELNP	ASTM A193 B7
5*	Inlet gasket	Graphite/Stainless steel laminate	
6*	Outlet gasket	Graphite/Stainless steel laminate	
7	Main valve seat	Stainless steel	EN10088-3 1.4057
8 **	Main valve/air vent seat gasket	Stainless steel	EN10088-2 1.4307
9	Main valve assembly screws	Stainless steel	BS EN ISO3506 Cl A2
10	Ball float and lever	Stainless steel	EN10088-2 1.4301
11	Air vent assembly	Stainless steel	
12	Pivot frame	Stainless steel	EN10088-3 1.4057
13	Pivot pin	Stainless steel	

Notes:
* Items 5 and 6 are shown clearly in the spares drawing overleaf.
** **8** Item not shown in this image

Dimensions/weight (approximate) in mm (inches) and kg (lbs)



A	B	C	Weight
168.5 (6.63)	94 (3.7)	47 (1.85)	2.02 (4.45)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P146-01) supplied with the product.

Installation note:

The UFT32 can be installed on any pipeline connector, but must be installed in a horizontal plane with the 'TOP' label facing upwards See separate Installation and Maintenance Instructions for Spirax Sarco pipeline connectors (IM-P128-06, IM-P128-11 and IM-P128-13).

Disposal

The UFT32 trap unit is manufactured from stainless steel and is therefore totally recyclable. No ecological hazard is anticipated with the disposal of this product provided due care is taken.

How to specify

Steam traps shall be sealed ball float traps UFT32 type suitable for a differential operating pressure of either 4.5, 10, 14, 21 or 32 bar. Traps to be zero maintenance and be connected to a separate pipeline connector by two screws to allow for quick and simple installation/ replacement.
For example Spirax Sarco UFT32-32 ball float steam trap.

How to order

The UFT32 is supplied as follows:-

1. The swivel pipeline connector	**PC10HP**	Standard connection
	PC20	One integral ISO valve plus 'Y' type strainer
	IPC21	One integral ISO valve plus 'Y' type strainer and Spiratec sensor
	PC3_	One integral ISO valve
	PC4_	Two integral ISO valves
2. The STS17.2 steam trap station		
3. The UFT32 trap complete with inner and outer gaskets and two connector screws. These items will be supplied in a protective box.		

Note: Any optional extras need to be specified at the time of order placement.

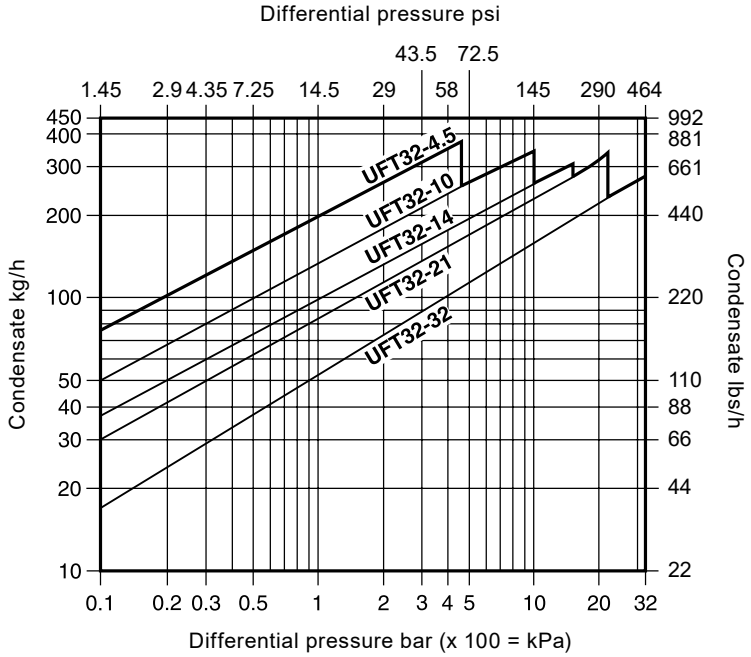
How to order example:
1 off Spirax Sarco DN20 PC10HP pipeline connector with socket weld connections.
or
1 off DN20 STS17 steam trap station having socket weld connections.
and/or if you are ordering a replacement for an existing unit:
1 off Spirax Sarco UFT32-21 sealed stainless steel ball float steam trap.
plus
1 off Spirax Sarco insulating jacket to fit a UFT32.

Please note: The above items are to be supplied with connector screws and gaskets.

Capacities (in accordance with ISO 7842)

Note: Capacities shown are based on discharge at saturation temperature. When discharging sub-cooled condensate the air vent provides extra capacity. Under start-up conditions the thermostatic air vent will be open, and will provide additional condensate capacity to the main valve assembly. This will provide a minimum of 100% increased capacity above the hot condensate figures shown.

For example:
A UFT32-14 has a hot condensate capacity of 195 kg/h at 5 bar differential.
The cold start-up capacity will be a minimum of 390 kg/h.



Spare parts

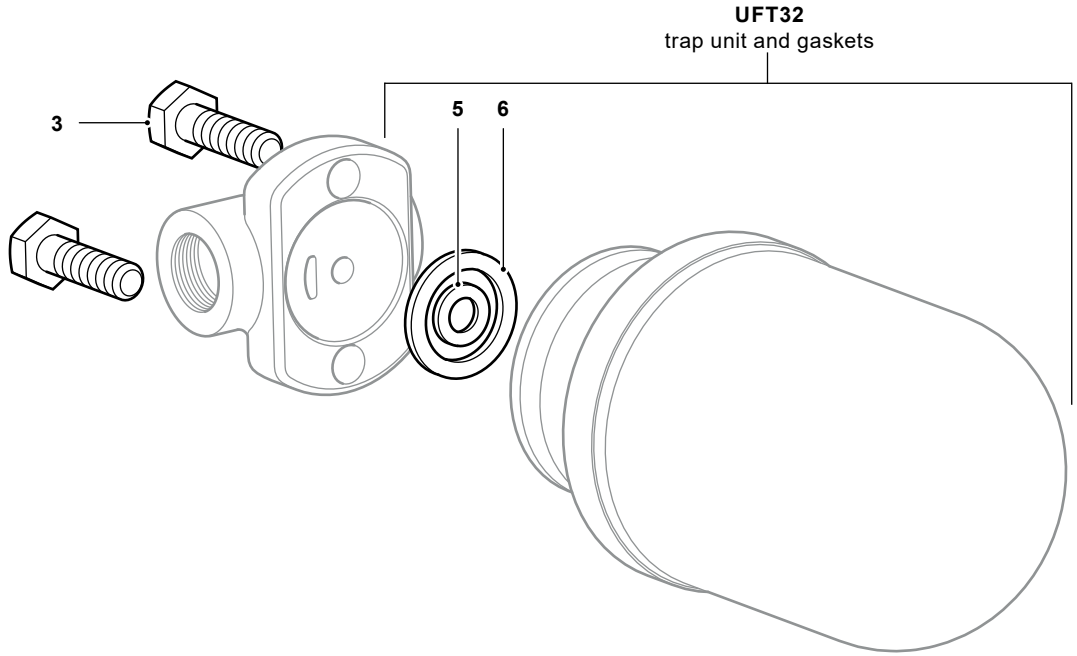
The UFT32 is a sealed non-maintainable trap unit. No internal spares are available.
The spares that are available are shown in solid outline. Parts shown in a grey line are not available as spares.

Available spares

Connector screws (x 2)	**3**
Complete UFT32 trap unit inclusive of gaskets and connector screws (3)	

How to order spares

Always order spare parts by using the description given in the column headed 'Available spares' and state the size, model no. and pressure rating of the trap.
Example: 2 x Connector screws for a Spirax Sarco UFT32
sealed stainless steel ball float steam trap (for use with pipeline connectors).



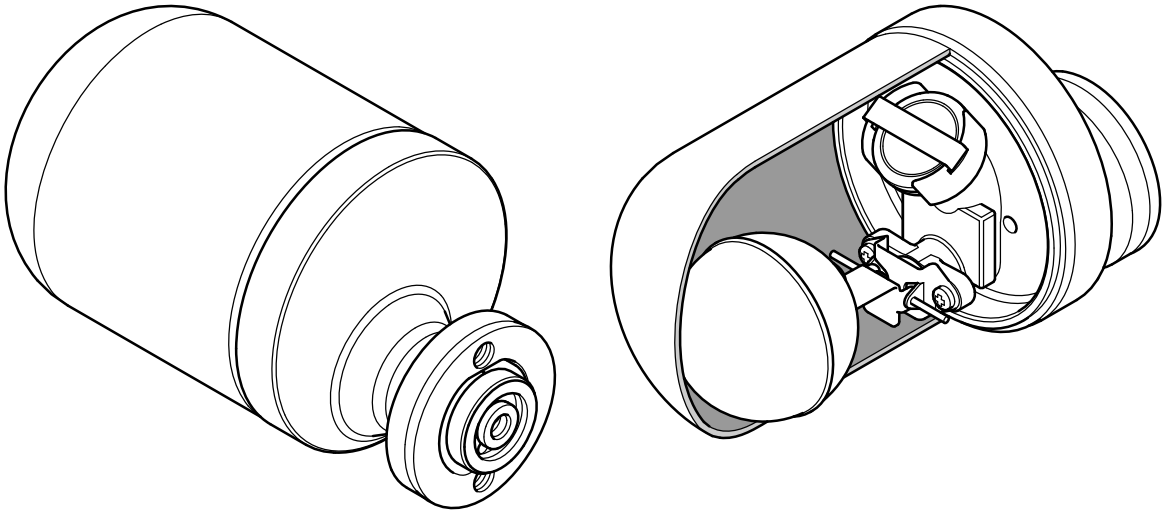
Recommended tightening torques

Item	Part	or mm	N m
3	Connector screws	9/16" A/F	33

TI-P712-01
CMGT Issue 6

UFT14HC
Sealed Stainless Steel Ball Float Steam Trap (for use with Pipeline Connectors)

Description
The UFT14HC is an austenitic stainless steel maintenance free sealed ball float steam trap with an integral automatic air venting facility. It is designed for differential steam pressures up to 14 bar g (203 psi g) on saturated steam services. When installed with a suitable pipeline connector, the UFT14HC can easily and simply be removed without breaking into the pipeline, thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available with screwed, socket weld and flanged end connections.



Media use
The UFT14HC is designed for use on Superheated/Saturated steam and condensate only, within the pressure and temperature limits shown in the section below.

Standards
This product fully complies with the European Pressure Equipment Directive 2014/68/EU. The body to cover welded joint complies with ASME Section IX and BS EN ISO 15614-1.

Certification and approvals
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Typical applications
The UFT14HC is designed to remove condensate from process applications and must be fitted to a pipeline connector, the options are:-

PC10HP	Straight connector	ASME Class 600	(TI-P128-10)
PC20	Straight connector with 'Y' type strainer	ASME Class 300	(TI-P128-15)
IPC21	Straight connector with 'Y' type strainer and integral Spiratec sensor	ASME Class 300	(TI-P128-15)
PC3_	Straight connector with one piston isolation valve	ASME Class 600	(TI-P128-02)
PC4_	Straight connector with two piston isolation valve	ASME Class 600	(TI-P128-03)
STS17.2	Steam trapping station	ASME Class 300/PN40	(TI-P128-22)

Range and options

The UFT14HC is available with internals designed to operate to either 4.5 bar g, 10 bar g or 14 bar g (differential pressures).

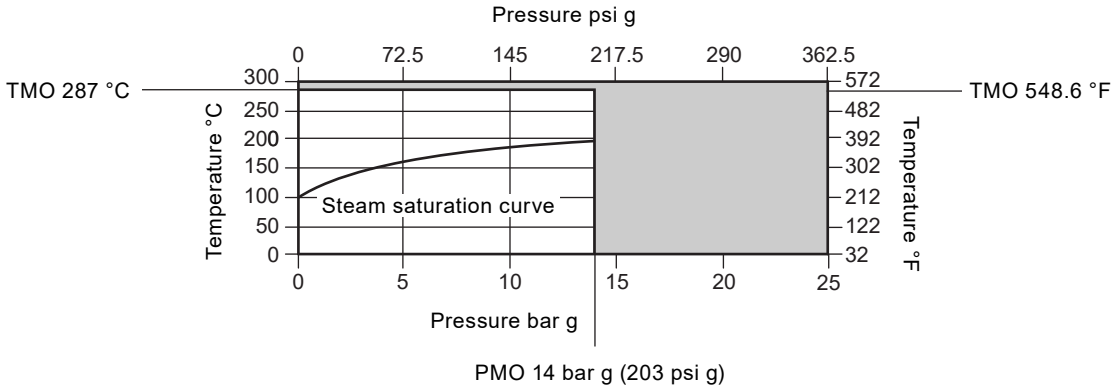
Optional extras

An insulation jacket is available for this product IJ-UFT14HC.

Sizes and connections

The UFT14HC has a single connection to a suitable pipeline pipeline connector (see options above). It is secured to the pipeline connector with two screws that are supplied with the trap.

Pressure/temperature limits (ISO 6552)



The product should not be used in this region as it is outside of its operating range.

The product **must not** be used in this region.

Note: Please note the lower rating of either the pipeline connector or the steam trap will determine the maximum allowable pressure and temperature for the system.

Body design conditions			PN25
PMA Maximum allowable pressure		25 bar g @ 300 °C	363 psi g @ 572 °F
TMA Maximum allowable temperature		300 °C @ 25 bar g	572 °F @ 363 psi g
Minimum allowable temperature		-10 °C	14 °F
PMO Maximum operating pressure		14 bar g @ 287 °C	203 psi g @ 548.6 °F
TMO Maximum operating temperature		287 °C @ 14 bar g	548.6 °F @ 203 psi g
Product is safe for use under full vacuum conditions			
Minimum operating temperature		0 °C	32 °F
Minimum allowable pressure			0 bar abs
Maximum differential pressure	UFT14HC-4.5	4.5 bar	65.3 psi
	UFT14HC-10	10 bar	145 psi
	UFT14HC-14	14 bar	203 psi
Designed for a maximum cold hydraulic test pressure of:		38 bar	551 psi

The UFT14HC is suitable for both indoor and outdoor use above the minimum temperatures shown above.

Nozzle loading
The UFT14HC is not designed to withstand external forces.

Materials (for information only) UFT14HC is sealed and non serviceable

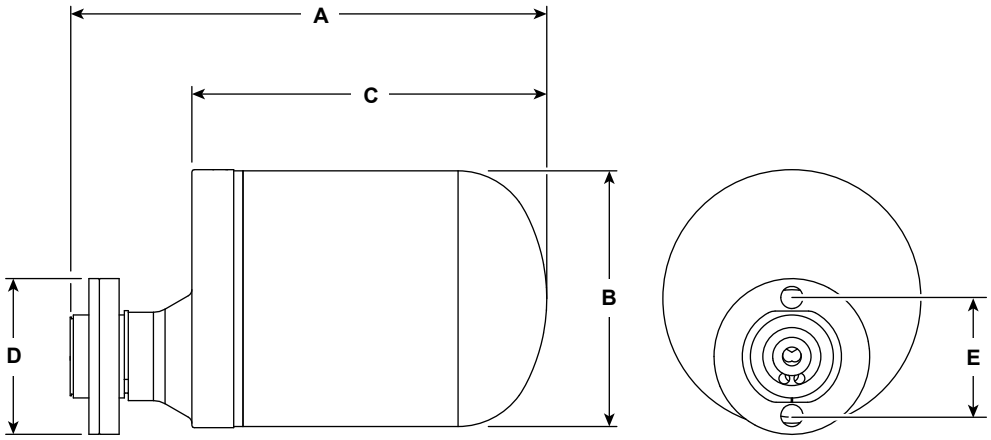
Part	Material	
Body	Austenitic stainless steel 304	EN10213-4 1.4308/ASTM A351 CF8
Cover	Austenitic stainless steel 304	EN 10028-7 1.4301/ASTM A240 304
Connector screws	Steel	ASTM A193 B7
Flange	Alloy steel - ELNP	ASTM A193 B7
Inlet gasket (shown on the spares drawing on page 5)	Graphite/Stainless steel laminate	
Outlet gasket (shown on the spares drawing on page 5)	Graphite/Stainless steel laminate	
Main valve seat	Stainless steel	EN10088-3 1.4057
Main valve/air vent seat gasket	Stainless steel	EN10088-2 1.4307
Main valve assembly screws	Stainless steel	BS EN ISO3506 Cl A2
Ball float and lever	Stainless steel	EN10088-2 1.4301
Air vent assembly	Stainless steel	
Pivot frame	Stainless steel	EN10088-3 1.4057
Pivot pin	Stainless steel	ASTM A276 431

* No silicone is contained in this product.

External surface finish
The UFT14HC is supplied with unpainted natural investment casting/extrusion external finish.

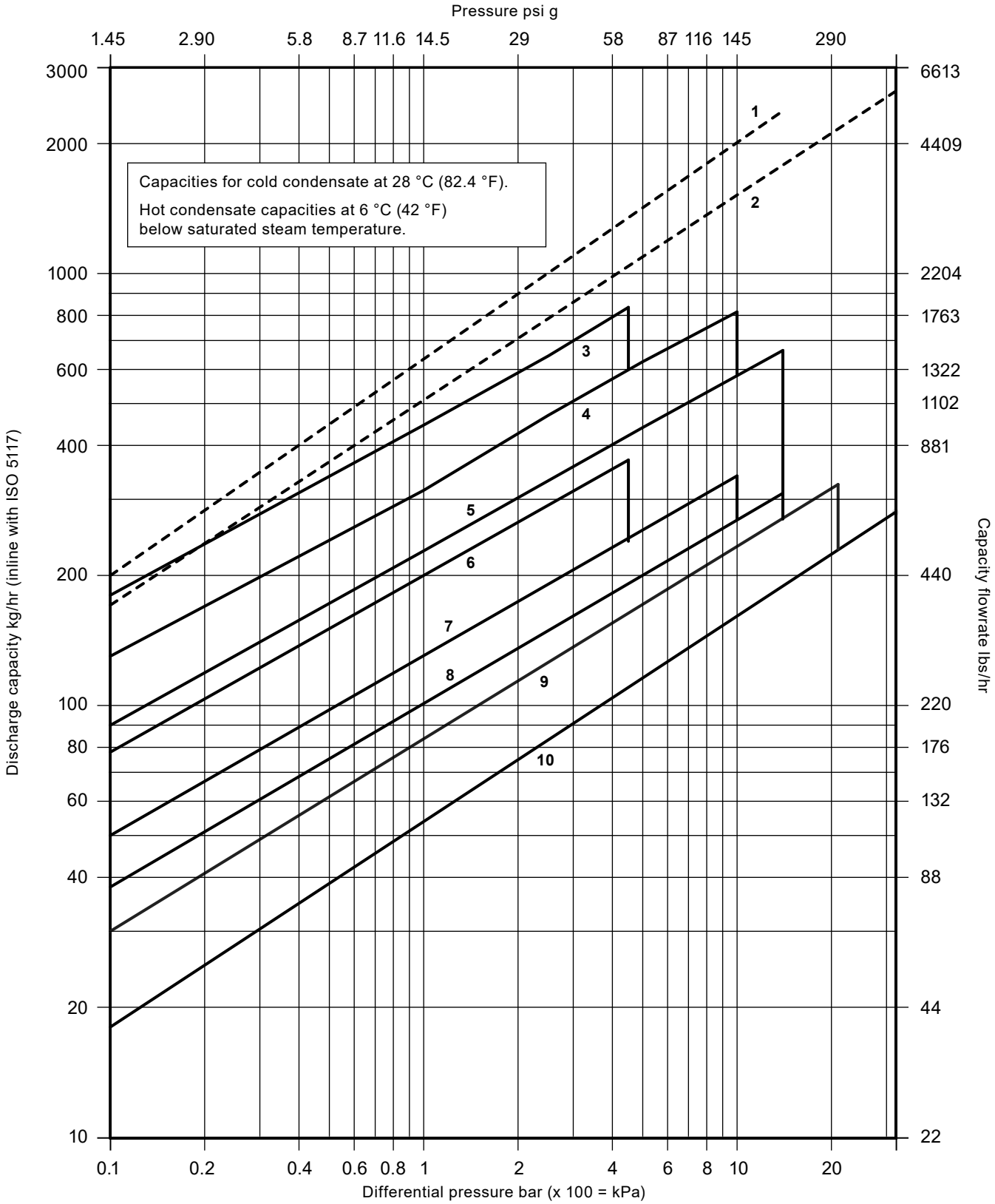
Dimensions (approximate) in mm and inches

	mm	inches
A	205	8.07
B	110	4.33
C	153	6.02
D	67	2.64
E	50.8	2.0



Weights (approximate) in kg and lbs
2.98 kg (6.57 lbs) (trap unit only)

Capacities (in accordance with ISO 5117)



1	UFT14HC Cold capacity	**3**	UFT14HC-4.5	**5**	UFT14HC-14	**7**	UFT32-10	**9**	UFT32-21
2	UFT32 Cold capacity	**4**	UFT14HC-10	**6**	UFT32-4.5	**8**	UFT32-14	**10**	UFT32-32

For details of the UFT32 see separate literature TI-P146-05.

Note: The capacities are based on the trap only, in line with ISO 5117. Actual capacities are dependent on the pipeline connector used. Please contact Spirax Sarco for further details

Orifice sizes

UFT14HC-4.5	5.7 mm	(0.22")
UFT14HC-10	4.0 mm	(0.157")
UFT14HC-14	3.4 mm	(0.134")

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P712-03) supplied with the product.

How to specify

Steam traps shall be sealed ball float traps UFT14HC type suitable for a differential operating pressure of either 4.5, 10 or 14 bar. Traps are maintenance free and connected to a separate pipeline connector by two screws to allow for quick and simple installation/ replacement. For example Spirax Sarco UFT14HC-4.5 ball float steam trap.

How to order

1 off Spirax Sarco UFT14HC-10 stainless steel sealed ball float steam trap with 3.1 certificate.
Important: The UFT14HC must be fitted to a pipeline connector to work. See above and individual product technical information sheets for options. The pipeline connector and insulation jackets should be ordered as separate lines on the order.

Spare parts

The UFT14HC is a sealed non-maintainable trap unit. No internal spares are available.
The spares that are available are shown in solid outline. Parts shown in a grey line are not available as spares.

Available spares

Connector screws (x2)	**3**
Gasket set	**5 and 6**

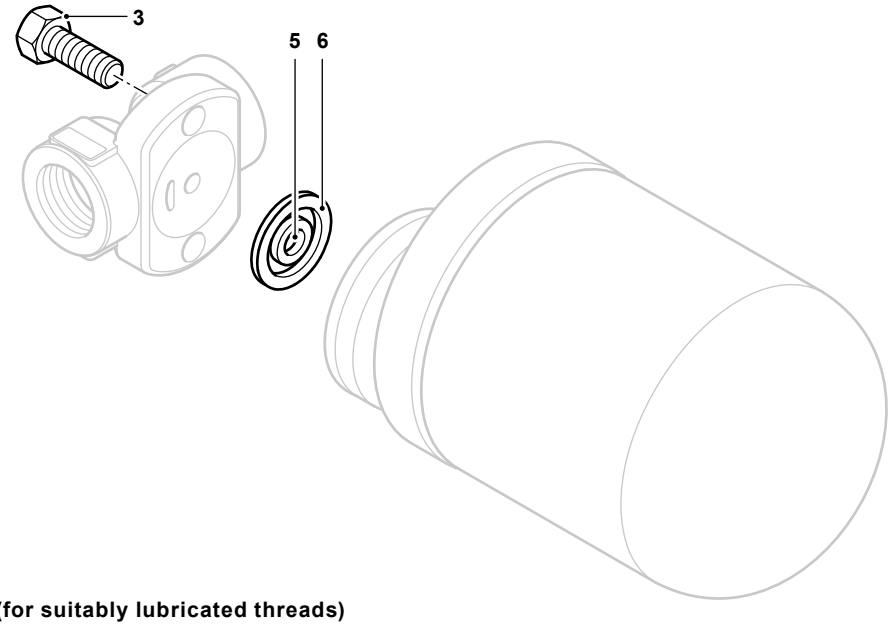
Accessories

Insulation jacket is available.

How to order spares

Always order spare parts by using the description given in the column headed 'Available spares' and state the size, model no. and pressure rating of the trap.

Example:
2 x Connector screws for a Spirax Sarco UFT14HC-4.5 sealed stainless steel ball float steam trap (for use with pipeline connectors)



Recommended tightening torques (for suitably lubricated threads)

Item	Part			N m	ft.lbs
3	Connector screws	9/16" A/F	3/8" UNC	33	24.4

REACH statement
Please visit the Spirax Sarco product compliance web pages
https://www.spiraxsarco.com/product-compliance
for up to date information on any substances of concern that may be contained within this product. Where no additional information is provided on the Spirax Sarco product compliance web page, this product may be safely recycled and/or disposed providing due care is taken. Always check your local recycling and disposal regulations.

TI-P187-03
CMGT Issue 7

UTDS46M

Stainless Steel Thermodynamic Steam Trap for use with Pipeline Connectors

Description

The UTDS46M is a workshop maintainable stainless steel thermodynamic steam trap with integral strainer, integral air vent, insulation cover and a replaceable seat. It has been specifically designed for low capacity applications up to 46 bar g (667 psi g).
The UTDS46M is attached to a suitable pipeline connector by two screws for quick and easy installation, and replacement.

Optional extra

At extra cost a **BDV2 integral blowdown valve** can be pre-fitted to the strainer cap but must be specified at the time of order placement.

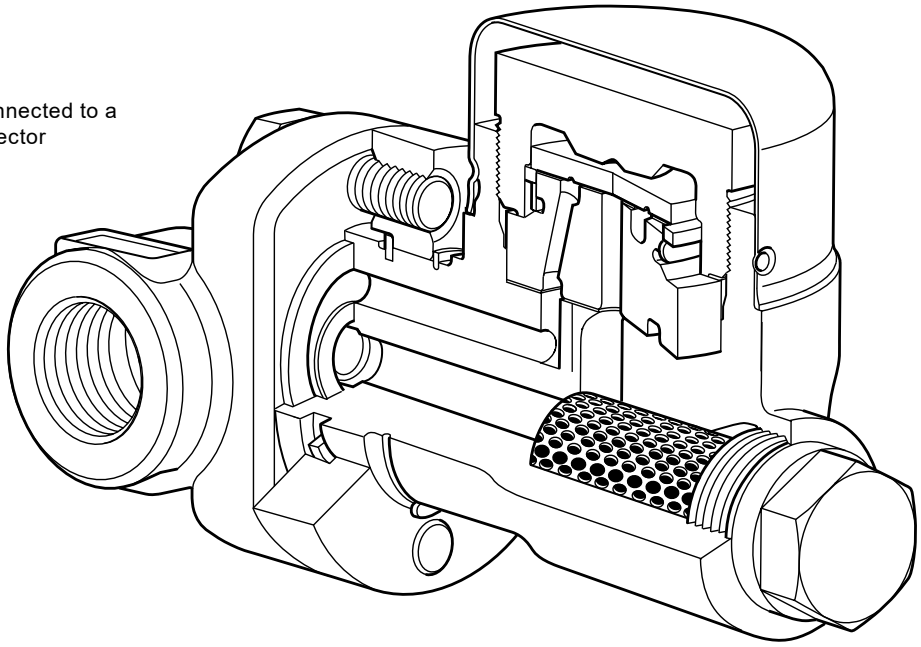
Standard

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification / inspection requirements must be specified at the time of order placement.

UTDS46M shown connected to a **PC10HP** pipeline connector



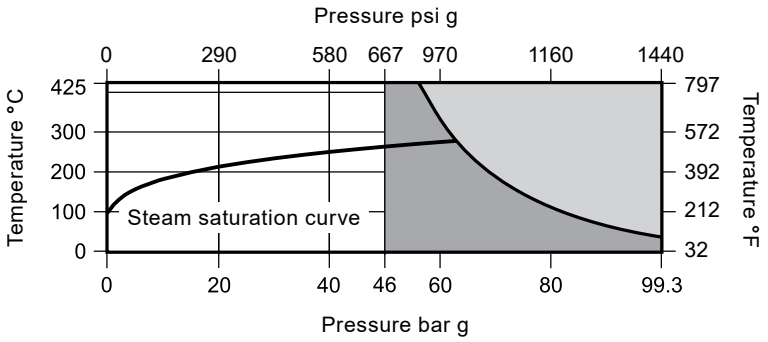
Pipeline connector options

The UTDS46M can be fitted to a variety of pipeline connectors:

PC10HP	Straight connector	ASME 600	(TI-P128-10)
PC3_	Straight connector with one piston isolation valve	ASME 600	(TI-P128-02)
PC4_	Straight connector with two piston isolation valves	ASME 600	(TI-P128-03)

See the relevant Technical Information sheet as listed above for details of the connections available for each pipeline connector.

Pressure / temperature limits



The product **must not** be used in this region.

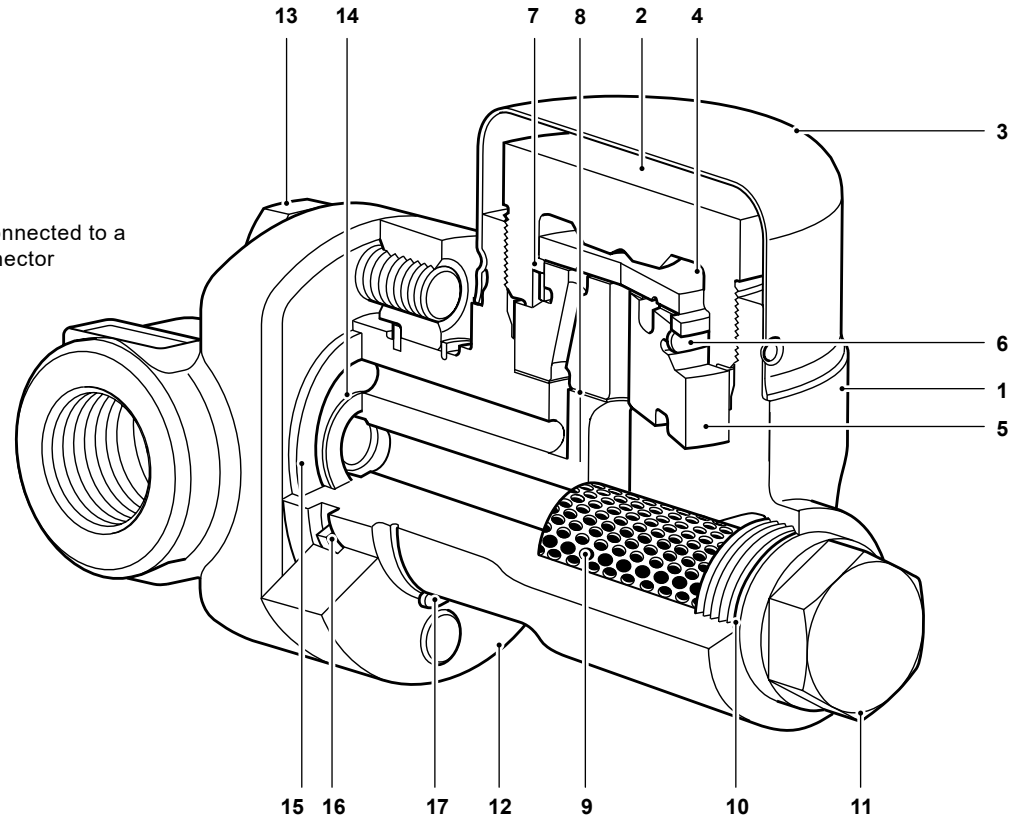
The product **should not** be used in this region.

Note: The model of pipeline connector and connection selected will dictate the maximum operating limits of the complete assembly. Reference the specific pipeline connector Technical Information sheet as detailed in 'Pipeline connector options'.

Body design conditions		ASME Class 600
PMA Maximum allowable pressure	99.3 bar g @ 38 °C	1,440 psi g @ 100 °F
TMA Maximum allowable temperature	425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum allowable temperature	-40 °C	-40 °F
PMO Maximum operating pressure	46 bar g @ 425 °C	667 psi g @ 797 °F
TMO Maximum operating temperature	425 °C @ 46 bar g	797 °F @ 667 psi g
Minimum operating pressure	1.5 bar g	22 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco	0 °C	32 °F
PMOB Maximum operating backpressure is 80% of the upstream pressure		
Designed for a maximum cold hydraulic test pressure of	149 bar g	2,161 psi g

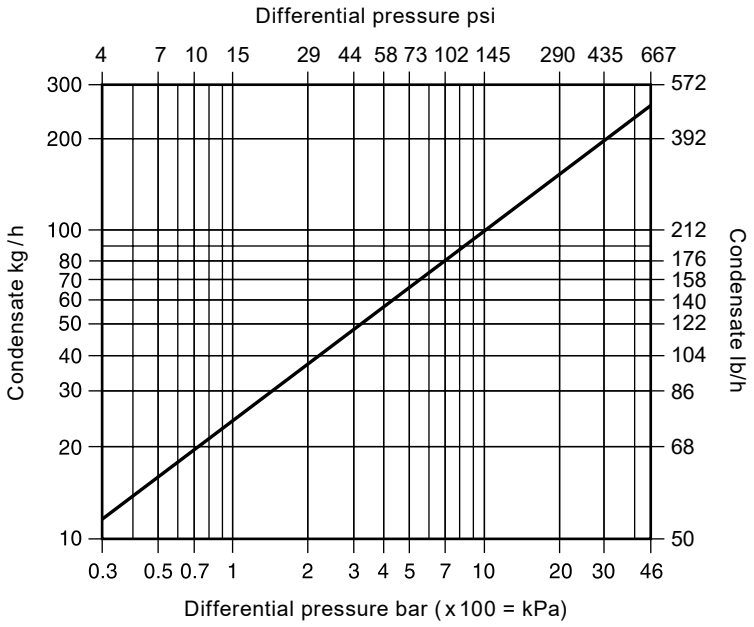
Materials

UTDS46M shown connected to a **PC10HP** pipeline connector

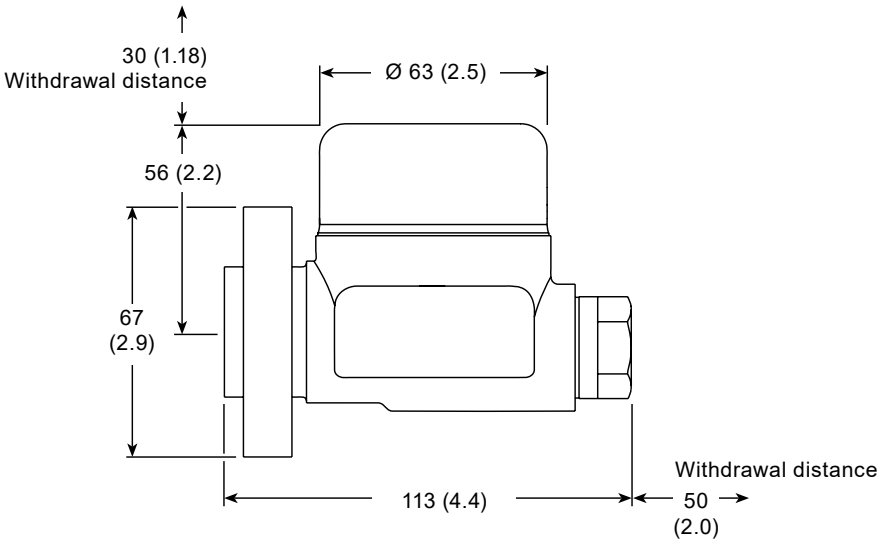


No.	Part	Material	
1	Body	Stainless steel	1.4308/ASTM A351 CF8
2	Top cap	Stainless steel	1.4301/ASTM A479 304
3	Insulating cover	Stainless steel	EN 10088-1 1.4301
4	Disc	Hardened steel	1.2379
5	Seat	Hardened steel	1.2379
6	Bimetal ring	Bimetal	
7	Support	Stainless steel	AISI 304
8	Seat gasket	Graphite foil	
9	Strainer screen	Stainless steel	ASTM A478 316L
10	Strainer cap gasket	Stainless steel	AISI 304
11	Strainer cap	Stainless steel	1.4308/ASTM A351 CF8
12	Flange	Steel - ELNP	ASTM A193 B7
13	Screws	Steel	ASTM A193 B7
14	Inner gasket	Graphite/stainless steel laminate	AISI 316 strip
15	Outer gasket	Graphite/stainless steel laminate	AISI 316 strip
16	Split ring	Stainless Steel	ASTM A240 304
17	Crescent ring	Carbon spring steel	

Capacities



Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Weight

approximately 1.75 kg (3.86 lb)

How to order - The UTDS46M is supplied in two parts:-

1. **The swivel pipeline** connectors	**PC10HP**	Straight pipeline connector
	PC3_	Straight connector with one integral piston isolation valve
	PC4_	Straight connector with two integral piston isolation valves

2. **The UTDS46M trap** complete with inner and outer gaskets and two connector screws. These items will be supplied in a protective box.

Note: Any optional extras need to be specified at the time of order placement.

How to order example:

1 off Spirax Sarco ¾" PC10HP swivel pipeline connector with socket weld connections.
1 off Spirax Sarco UTDS46M thermodynamic steam trap fitted with a BDV2 integral blowdown valve. The unit is supplied complete with connector screws and gaskets.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P187-05) supplied with the product.

Installation note:

The UTDS46M is designed for installation with the disc in a horizontal plane with the insulating cover at the top.
It is recommended that a non-return valve is fitted when discharging condensate into return lines where backpressure is experienced.
It is also recommended that a diffuser is fitted when discharging to atmosphere.
For ease of maintenance, consideration should be given to fitting isolation valves upstream and downstream of the steam trap.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Insulating cover	**3**
Top cap, seat and disc assembly	**2**, **4**, **5**, **6**, **7**, **8**
Strainer screen	**9**, **10**
Set of gaskets (packets of 3 sets)	**8**, **10**
Connector screws and gaskets	**13**, **14**, **15**
BDV2 blowdown valve retrofit kit	

How to order spares

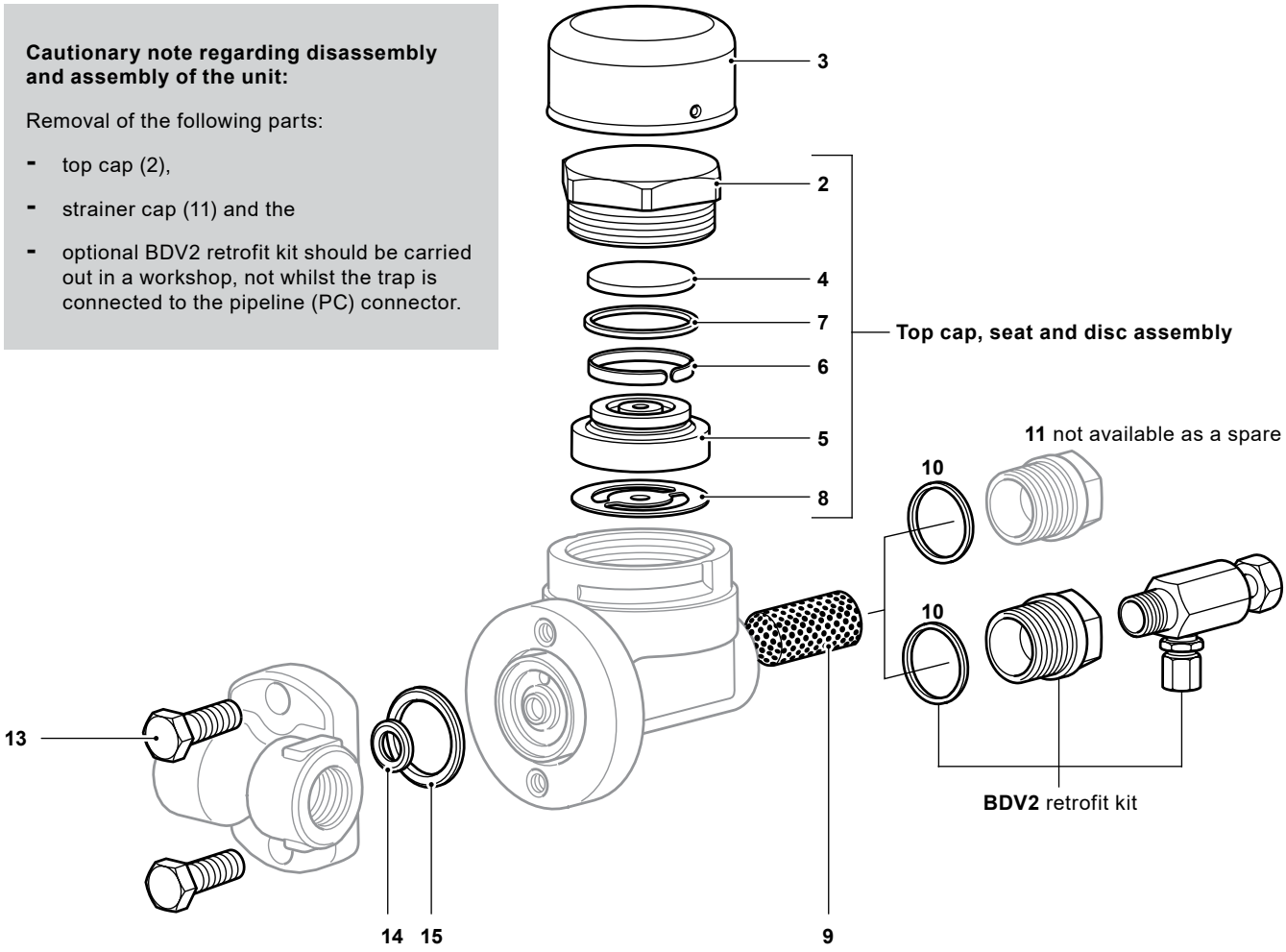
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of steam trap.

Example: 1 - Top cap, seat and disc assembly for a Spirax Sarco UTDS46M thermodynamic steam trap.

Cautionary note regarding disassembly and assembly of the unit:

Removal of the following parts:

- top cap (2),
- strainer cap (11) and the
- optional BDV2 retrofit kit should be carried out in a workshop, not whilst the trap is connected to the pipeline (PC) connector.



Recommended tightening torques (for suitably lubricated threads)

Item	Part	mm	N m	(lbf ft)
2	Top cap	50 A/F	400	295
11	Strainer cap	24 A/F	110	46.5 - 48.7
13	Connector screws	9/16" A/F	33	19

TI-P127-01
CMGT Issue 10

UBP32 Sealed Balanced Pressure Thermostatic Steam Trap for use with Pipeline Connectors

Description

The UBP32 is a maintenance free sealed balanced pressure steam trap manufactured in stainless steel - It can also be supplied with an inbuilt check valve designated UBP32CV. When installed with a suitable pipeline connector the UBP32 can easily and simply be removed without breaking into the pipeline thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available as screwed, socket weld and flanged. The body and cover meet typical industry standards including Charpy impact testing of 27J @ 30 °C (-22 °F).

Capsule operation

As standard the UBP32 is supplied with a thermostatic capsule (STD) which operates approximately 12 °C (22 °F) below steam saturation temperature. It can also be supplied with capsules operating near to steam 4 °C (7 °F) below (NTS) or sub cooled 22 °C (40 °F) below (SUB).

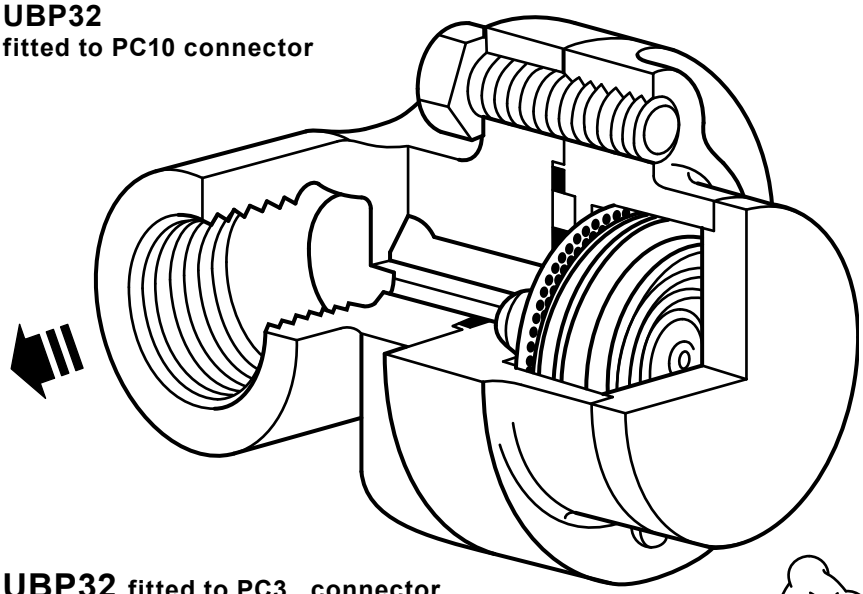
Standards

This product fully complies with the requirements of the EU Pressure Equipment Directive / UK Pressure Equipment (Safety) Regulations. The body to cover welded joint complies with ASME Section IX and BS/EN 288.

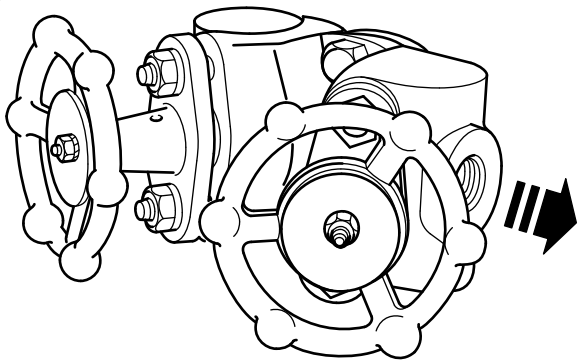
Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

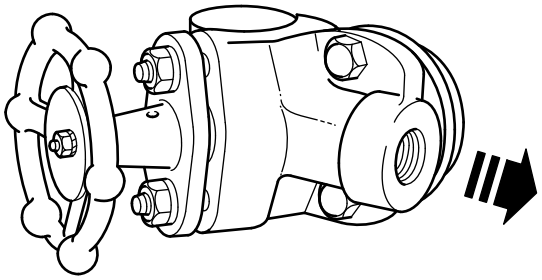
UBP32
fitted to PC10 connector



UBP32 fitted to PC4_ connector



UBP32 fitted to PC3_ connector

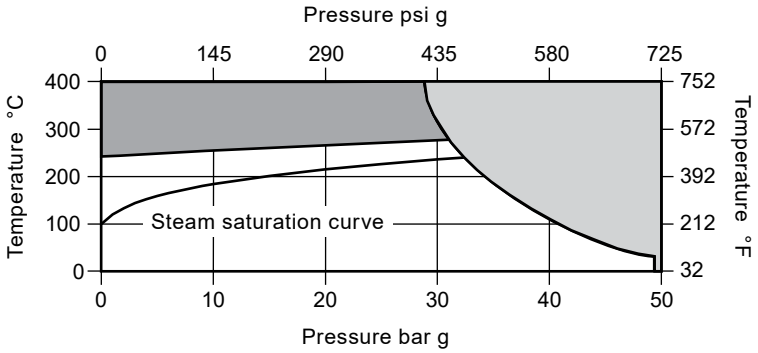


Pipeline connector options

The UBP32 can be fitted to a variety of pipeline connectors:

PC10	Straight connector	ANSI/ASME 300	(TI-P128-10)	See the relevant Technical Information sheet as listed opposite for details of connections available for each pipeline connector.
PC10HP	Straight connector	ANSI/ASME 600	(TI-P128-10)	
PC20	Connector with internal strainer	ANSI/ASME 300	(TI-P128-15)	
PC3_	Connector with one piston isolation valve	ANSI/ASME 600	(TI-P128-02)	
PC4_	Connector with one piston isolation valve	ANSI/ASME 600	(TI-P128-03)	

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

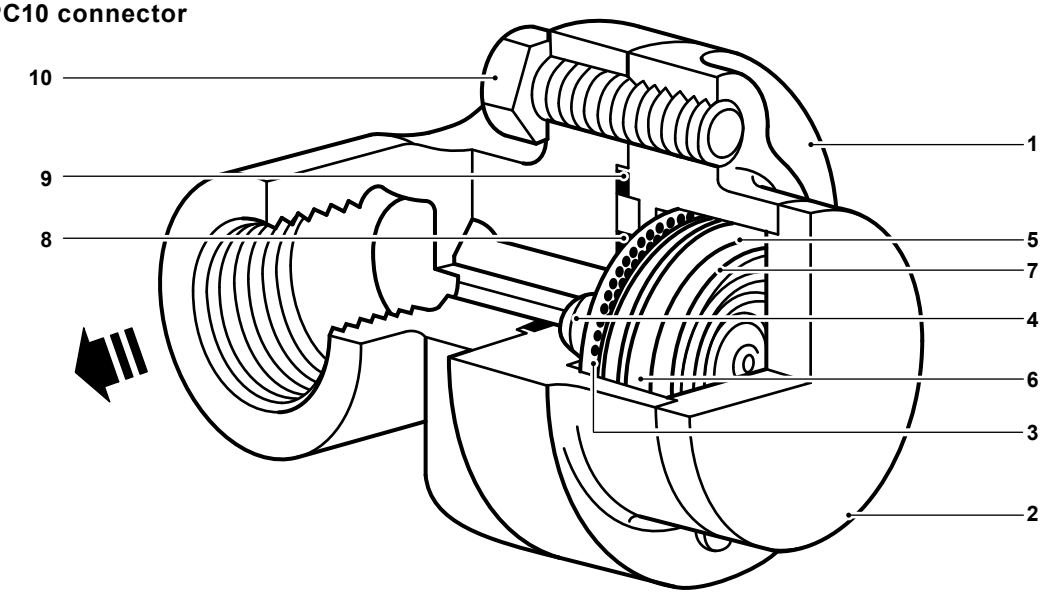
The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Note: The model of pipeline connector and connection selected will dictate the maximum operating limits of the complete assembly. Reference the specific pipeline connector Technical Information sheet as detailed in 'Pipeline connector options'.

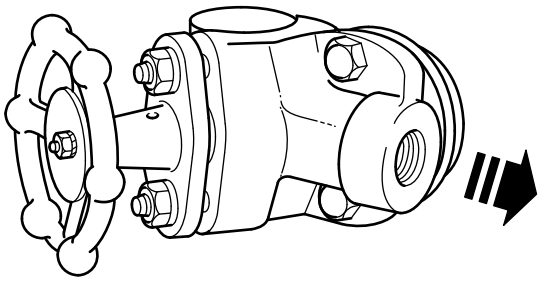
Body design conditions			PN50 (ANSI 300)
PMA	Maximum allowable pressure	50 bar g @ 38 °C	725 psi g@ 100 °F
TMA	Maximum allowable temperature	400 °C @ 28 bar g	752 °F @ 406 psi g
Minimum allowable temperature		-48 °C	-54 °F
PMO	Maximum operating pressure for saturated steam service	32 bar g	464 psi g
TMO	Maximum operating temperature	286 °C @ 31 bar g	547 °F @ 450 psi g
Minimum operating temperature		0 °C	32 °F
Designed for a maximum cold hydraulic test pressure of:		75 bar g	1088 psi g

Materials

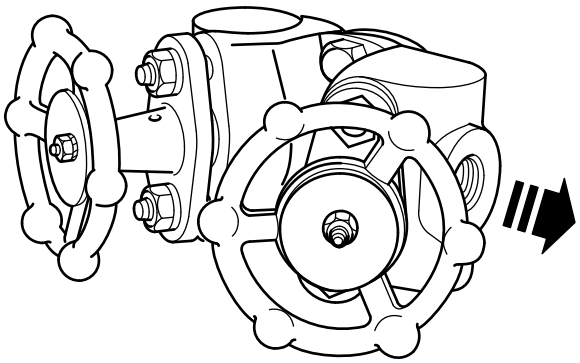
UBP32
fitted to PC10 connector



UBP32 fitted to PC3_ connector

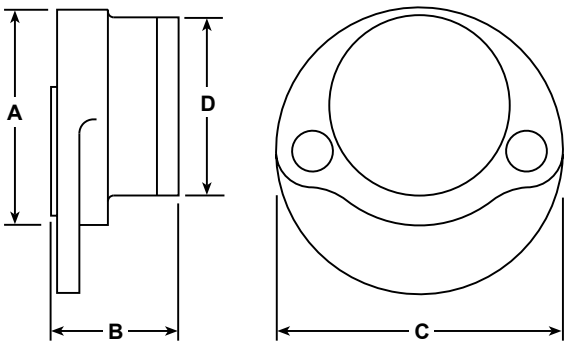


UBP32 fitted to PC4_ connector



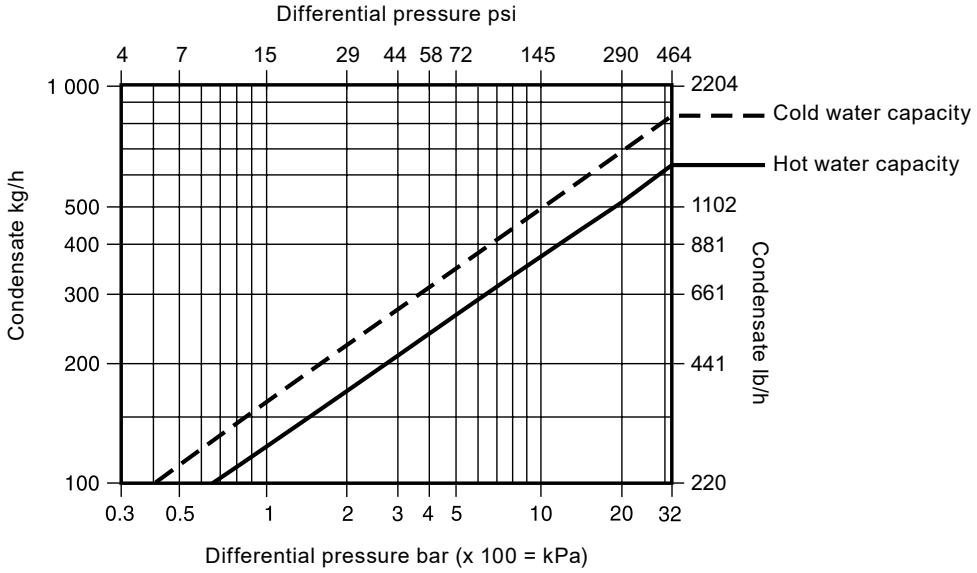
No.	Part	Material	
1	Body	Austenitic stainless steel (304 grade)	ASTM A351 Gr. CF8
2	Cover	Austenitic stainless steel (304 grade)	ASTM A276 Gr. 304
3	Screen	Stainless steel	ASTM A240 Gr. 304
4	Seat	Stainless steel	ASTM A276 Gr. 431
5	Capsule	Stainless steel	
6	Spacer plate	Stainless steel	ASTM A240 Gr. 304
7	Spring	Stainless steel	ASTM A313 Gr. 302
8	Inlet gasket	Graphite/AISI 316 strip	AISI 316 strip
9	Outlet gasket	Graphite/AISI 316 strip	AISI 316 strip
10	Connector screws	Steel	ASTM A193 B7

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



A	B	C	D	Weight (trap unit only)
35 (1.4)	33 (1.3)	68 (2.7)	42.5 (1.7)	0.43 (0.9)

Capacities



How to specify

Steam traps shall be of the sealed balanced pressure thermostatic UBP32 type manufactured in stainless steel and be suitable for operating pressures up to 32 bar g. Traps to be zero maintenance and be connected to separate pipeline connectors by two screws to allow for quick and simple installation/replacement. The thermostatic capsule is to operate at 12 °C /22 °C /4 °C below steam temperature depending on the capsule selected. Traps can be installed in any plane.

How to order The UBP32 is supplied in two parts:-

1. The swivel pipeline connector	PC1_	Standard connection
	PC3_	One integral ISO valve
	PC4_	Two integral ISO valve

2. The UBP32 trap complete with inner and outer gaskets (securely crimped in place) and two connector screws. All items will be supplied in a protective box.

How to order example:

1 off Spirax Sarco DN20 PC10 swivel pipeline connector with socket weld connections.

1 off Spirax Sarco UBP32 sealed balanced pressure thermostatic steam trap fitted with an STD capsule.

Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-P127-02) supplied with the product.

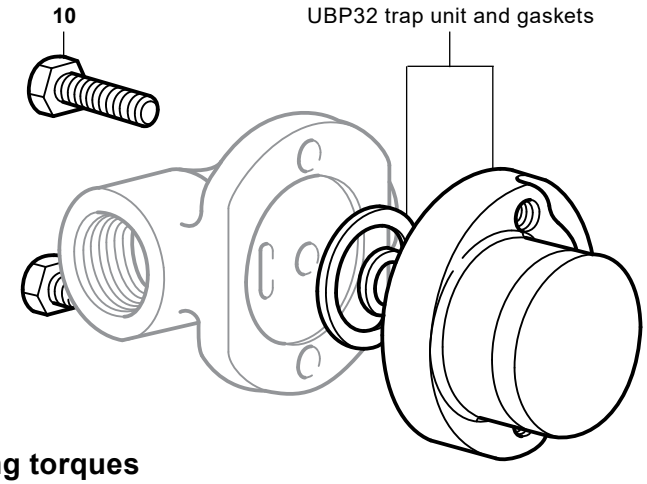
Installation note:
The UBP32 can be installed on any pipeline connector in any plane.

Disposal
This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

Spare parts
The UBP32 is a sealed non-maintainable trap unit. No internal spares are available.
The spares which are available are shown in solid outline. Parts shown in a grey line are not available as spares.

Available spares	
Connector screws	**10**
Complete UBP32 trap unit inclusive of gaskets and connector screws (**10**)	

How to order spares
Always order spare parts by using the description given in the column headed 'Available spares' and state the size, Model No. and pressure rating of the trap.
Example: 2 - Connector screws for a UBP32 sealed balanced pressure thermostatic steam trap.

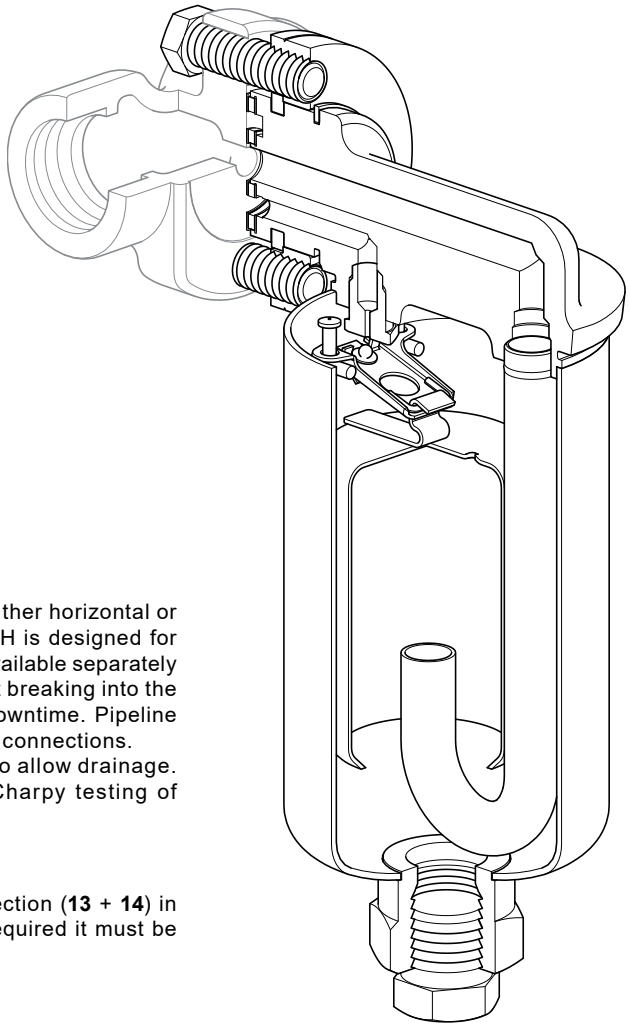


Recommended tightening torques

Item	or mm	N m	(ft lbf)
10	9/16"	30 - 35	(22 - 26)

TI-P113-01
CMGT Issue 12

UIB30 and UIB30H
Sealed Inverted Bucket Steam Traps
(for use with Pipeline Connectors)



Description

The UIB30 and UIB30H are sealed inverted bucket steam traps for either horizontal or vertical installation (with the cover hanging downwards). The UIB30H is designed for higher capacities. When installed with a suitable pipeline connector (available separately from Spirax Sarco) the UIB can easily and simply be removed without breaking into the pipeline, thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available with screwed, socket weld and flanged end connections.
The cover is also available with the option of a threaded base port to allow drainage.
The body and cover meet typical industry standards including Charpy testing of 27J @ -30 °C (-22 °F).

Optional extras

The cover (**1**) is also available with a threaded drain plug and connection (**13** + **14**) in ⅜" NPT, ½" NPT or ½" BSP to allow for drainage. If this option is required it must be specified at the time of order placement.

Standards

This product fully complies with the requirements of the Pressure Equipment Directive (PED).

Certification

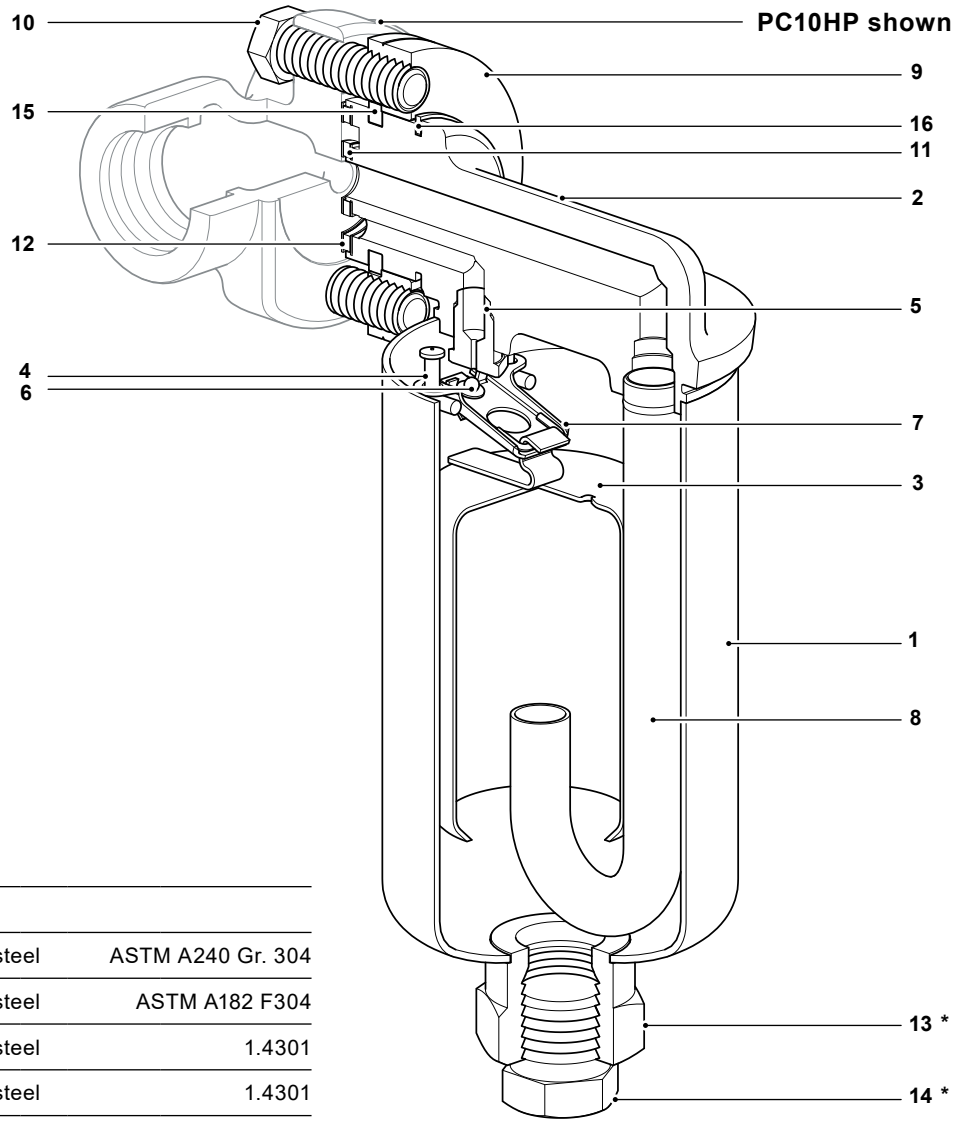
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Pipeline connector options

The UIB can be fitted to a variety of pipeline connectors including:

PC10HP	**Straight connector**	ASME 600	(TI-P128-10)	See the relevant Technical Information sheet as listed for details of the connections available for each pipeline connector.
PC20	**+** 'Y' type strainer	ASME 300	(TI-P128-15)	
PC3_	**+** 1 piston isolation valve	ASME 600	(TI-P128-02)	
PC4_	**+** 2 piston isolation valves	ASME 600	(TI-P128-03)	

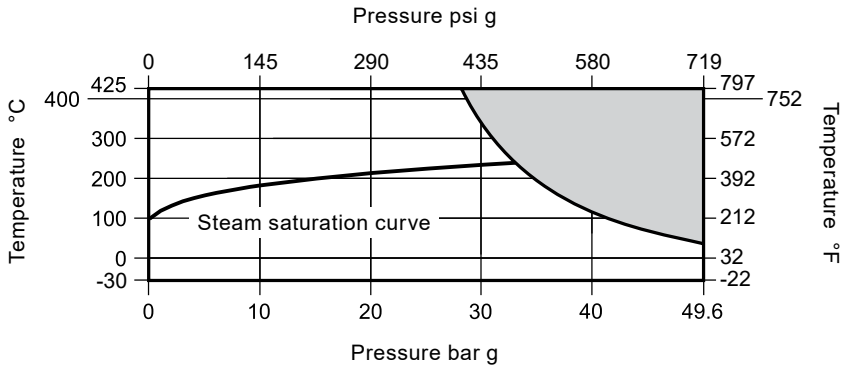
Materials



No.	Part	Material	
1	Cover	Stainless steel	ASTM A240 Gr. 304
2	Body	Stainless steel	ASTM A182 F304
3	Bucket	Stainless steel	1.4301
4	Pivot pin	Stainless steel	1.4301
5	Valve seat	Stainless steel	440B
6	Valve	Stainless steel	440B
7	Valve lever	Stainless steel	1.4301
8	Internal tube	Stainless steel	1.4306
9	Flange	Alloy steel - ELNP	ASTM A193 B7
10	Connector screw	Steel	ASTM A193 B7
11	Inlet gasket	Graphite/Stainless steel laminate	AISI 304 strip
12	Outlet gasket		
13 *	Drain connection	Stainless steel	ASTM A182 F304 / F304L
14 *	Drain plug	Stainless steel - ELNP	ASTM A479 316
15	Split ring	Stainless steel	ASTM A240 304
16	Crescent ring	Carbon spring steel	

* **Note:** Items **13** and **14** are optional extras that, if required, must be specified at the time of order placement.

Pressure/temperature limits (ISO 6552)



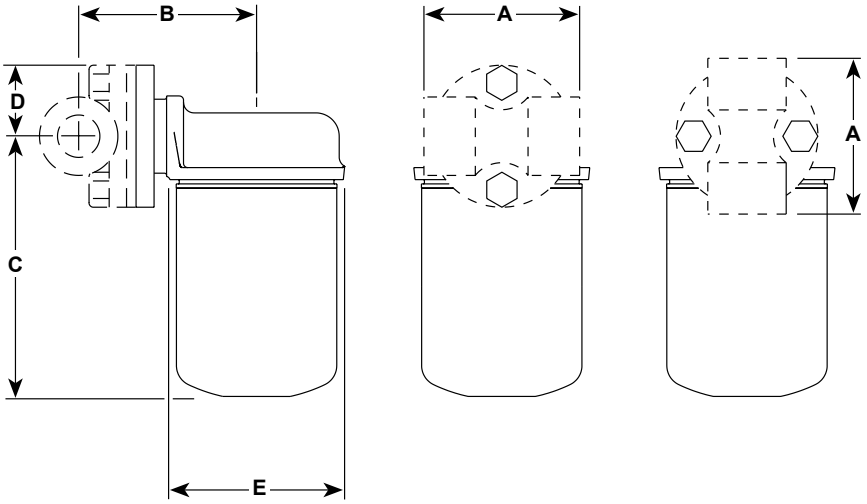
The product **must not** be used in this region.

Note: The model of pipeline connector and connections selected will dictate the maximum operating limits of the complete assembly. Reference the specific pipeline connector Technical Information sheet as detailed in 'Pipeline connector options'.

Body design conditions					ASME 300
PMA	Maximum allowable pressure		49.6 bar g @ 38 °C		719 psi g @ 100 °F
TMA	Maximum allowable temperature		425 °C @ 28 bar g		797 °F @ 406 psi g
Minimum ambient temperature			-30 °C		-22 °F
PMO	Maximum operating pressure for saturated steam service		32 bar g		464 psi g
TMO	Maximum operating temperature		425 °C @ 28 bar g		797 °F @ 406 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C		32 °F
Product is safe for use under full vacuum conditions					
Designed for a maximum cold hydraulic test pressure of			75 bar g		1088 psi g
		30.0 bar	(435 psi)	**UIB30/4**	**UIB30H/5**
		20.0 bar	(290 psi)	**UIB30/5**	**UIB30H/6**
		12.0 bar	(174 psi)	**UIB30/6**	**UIB30H/7**
		8.5 bar	(123 psi)	**UIB30/7**	**UIB30H/8**
ΔPMX	Maximum differential pressure	5.0 bar	(72.5 psi)		**UIB30H/10**
		4.0 bar	(58 psi)	**UIB30/8**	
		2.5 bar	(36.3 psi)	**UIB30/10**	
		2.0 bar	(29.0 psi)		**UIB30H/12**
		1.5 bar	(21.8 psi)	**UIB30/12**	

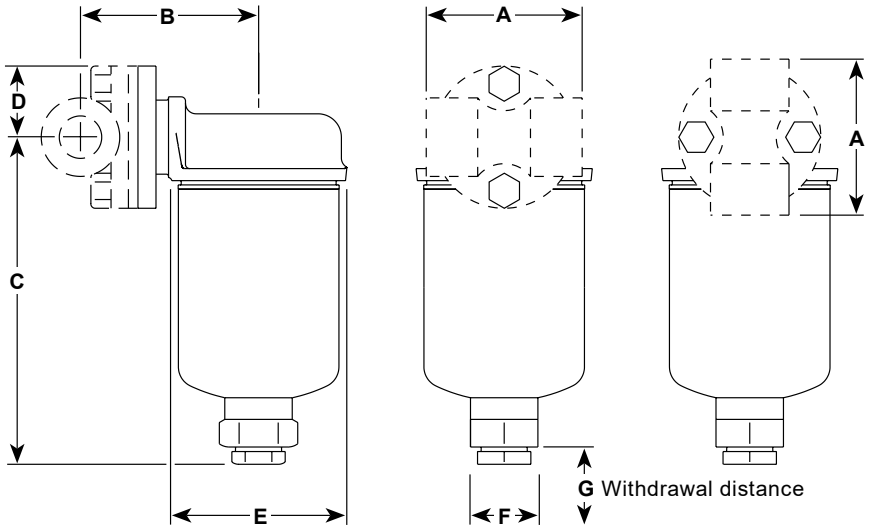
Dimensions/weights (approximate) in mm (inches) and kg (lbs)

UIB30 and UIB30H + PC10HP



Size	A	B	C		D	E	Weight			
			UIB30	UIB30H			UIB30	UIB30 + PC10HP	UIB30H	UIB30H + PC10HP
DN15 - ½"	61.5 (2.42)	88 (3.46)	124.5 (4.90)	159.0 (6.26)	33.5 (1.32)	83 (3.27)	1.70 (3.75)	2.30 (5.07)	1.85 (4.08)	2.45 (5.40)
DN20 - ¾"	73.5 (2.89)	86 (3.39)						2.40 (5.29)		2.55 (5.62)
DN25 - 1"	90.0 (3.54)	89 (3.50)								

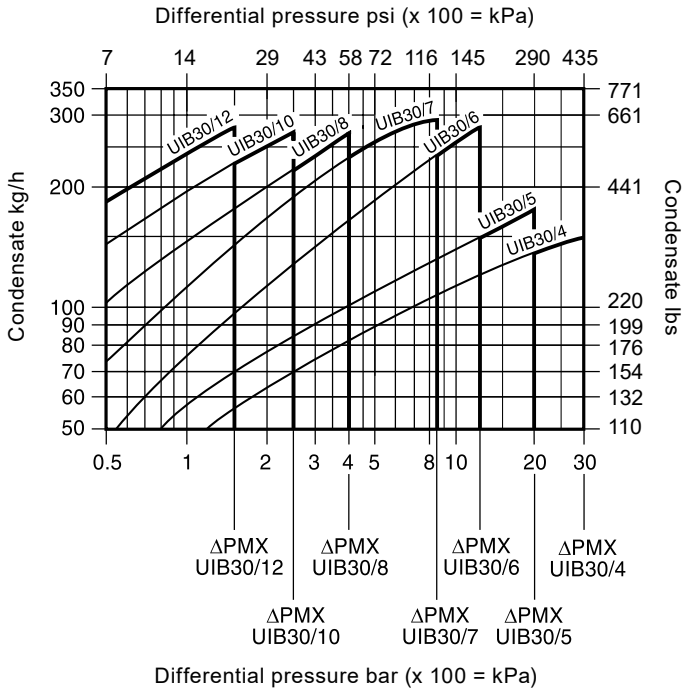
UIB30 and UIB30H with optional drain plug + PC10HP

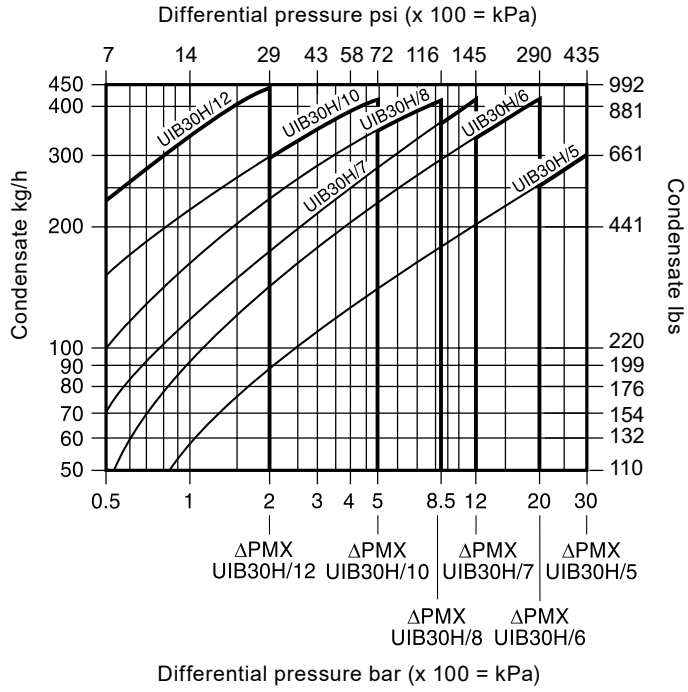


Size	A	B	C		D	E	F	G Plug withdrawal distance	Weight			
			UIB30	UIB30H					UIB30	UIB30 + PC10HP	UIB30H	UIB30H + PC10HP
DN15 - ½"	61.5 (2.42)	88 (3.46)	158 (6.22)	192 (7.56)	33.5 (1.32)	83 (3.27)	32 (1.26)	20 (0.79)	1.90 (4.19)	2.50 (5.51)	2.05 (4.52)	2.65 (5.84)
DN20 - ¾"	73.5 (2.89)	86 (3.39)								2.60 (5.73)		2.75 (6.06)
DN25 - 1"	90.0 (3.54)	89 (3.50)										

Capacities

Note: The trap should be selected for the most appropriate working pressure differential and not on the basis of load.
For example: 80 kg/h at 7 bar differential should be handled with the UIB30/7 and not the UIB30/4.





How to order The UIB30 is supplied in two parts:

1. The swivel pipeline connector	**PC10HP**	**Standard connection**	**Note:** Any optional extras need to be specified at the time of order placement.
	PC20	**+** 'Y' type strainer	
	PC3_	**+** 1 integral ISO valve	
	PC4_	**+** 2 integral ISO valves	

2. The UIB30 trap complete with inner and outer gaskets and two connector screws.

How to order example:
1 off ½" PC10HP swivel connector having screwed NPT connections for use with a UIB30/4 sealed inverted bucket steam trap.

1 off UIB30/4 sealed inverted bucket steam trap complete with gaskets and connector screws.
or
1 off UIB30/4 sealed inverted bucket steam trap with a ½" NPT drain plug and connection, complete with gaskets and connector screws.

Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-P113-02) supplied with the product.

Installation note:
The pipeline connector can be installed in either horizontal or vertical pipework.

DIsposal:
The UIB30 trap unit is manufactured from stainless steel and is therefore totally recyclable. No ecological hazard is anticipated with the disposal of this product provided due care is taken.

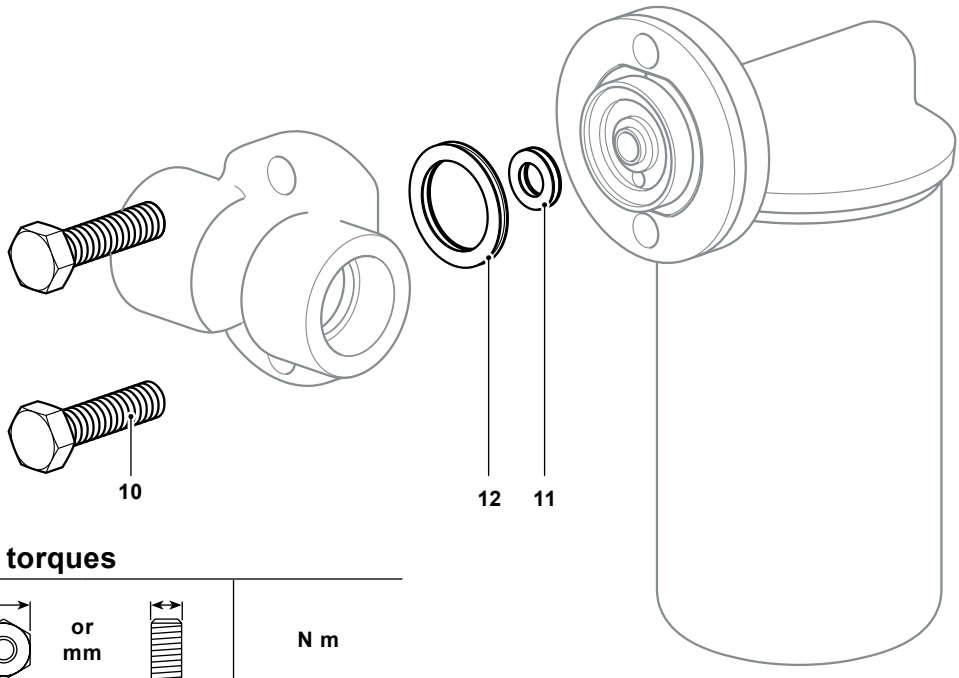
Spare parts
The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Connector screw and gasket set	**10**, **11**, **12**

How to order spares
Always order spares by using the description given in the column headed 'Available spares' and state the type of trap.

Example: 1 - Connector screw and gasket set for a Spirax Sarco UIB30 sealed inverted bucket steam trap.

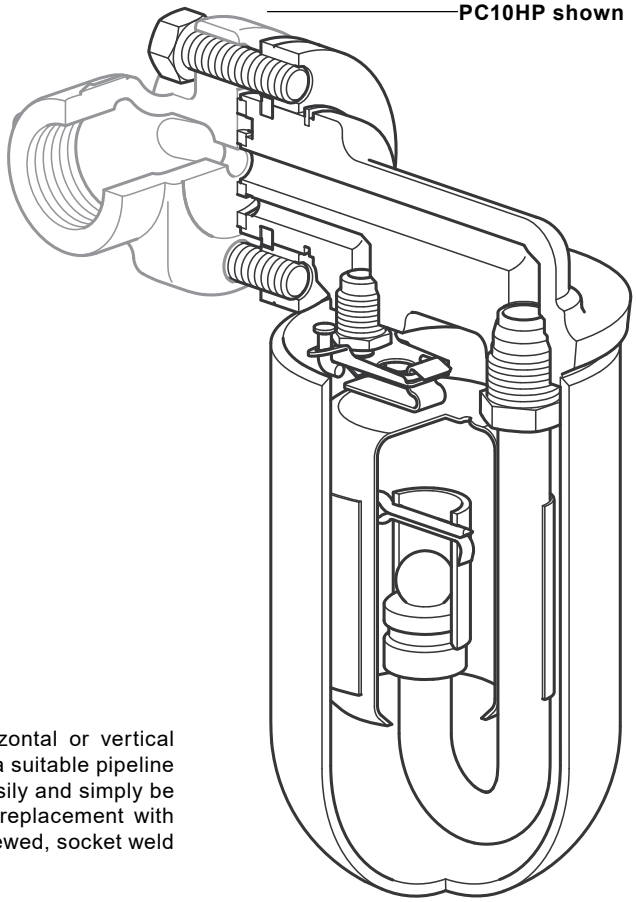


Recommended tightening torques

Item	Part	or mm	N m
10	Connector screws	9/16"	33

TI-P113-03
CMGT Issue 5

UIB45
Sealed Inverted Bucket Steam Trap (for use with Pipeline Connectors)


PC10HP shown

Description
The UIB45 is a sealed inverted bucket steam trap for either horizontal or vertical installation (with the cover hanging downwards). When installed with a suitable pipeline connector (available separately from Spirax Sarco) the UIB45 can easily and simply be removed without breaking into the pipeline, thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available with screwed, socket weld and flanged end connections.

Standards
This product fully complies with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations.

Note: The body/cover weld joint complies with ASME section IX.

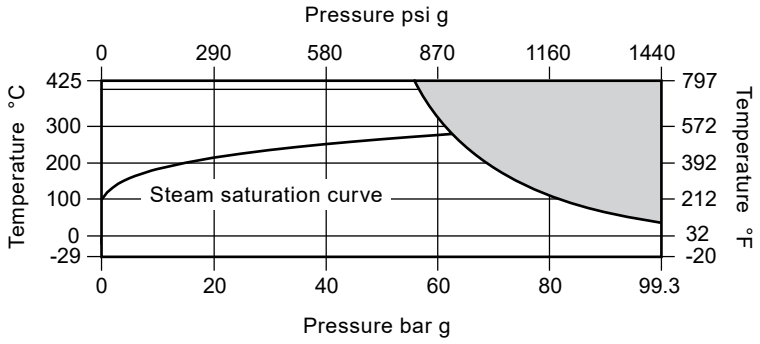
Certification
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Pipeline connector options
The UIB45 can be fitted to a variety of pipeline connectors including:

PC10HP	Straight connector	ASME 600	(TI-P128-10)
PC20	Straight connector with Maximum differential pressure	ASME 300	(TI-P128-15)
PC3_	Straight connector with one piston isolation valve	ASME 600	(TI-P128-02)
PC4_	Straight connector with two piston isolation valve	ASME 600	(TI-P128-03)

See the relevant Technical Information sheet as listed above for details of the connections available for each pipeline connector.

Pressure/temperature limits (ISO 6552)

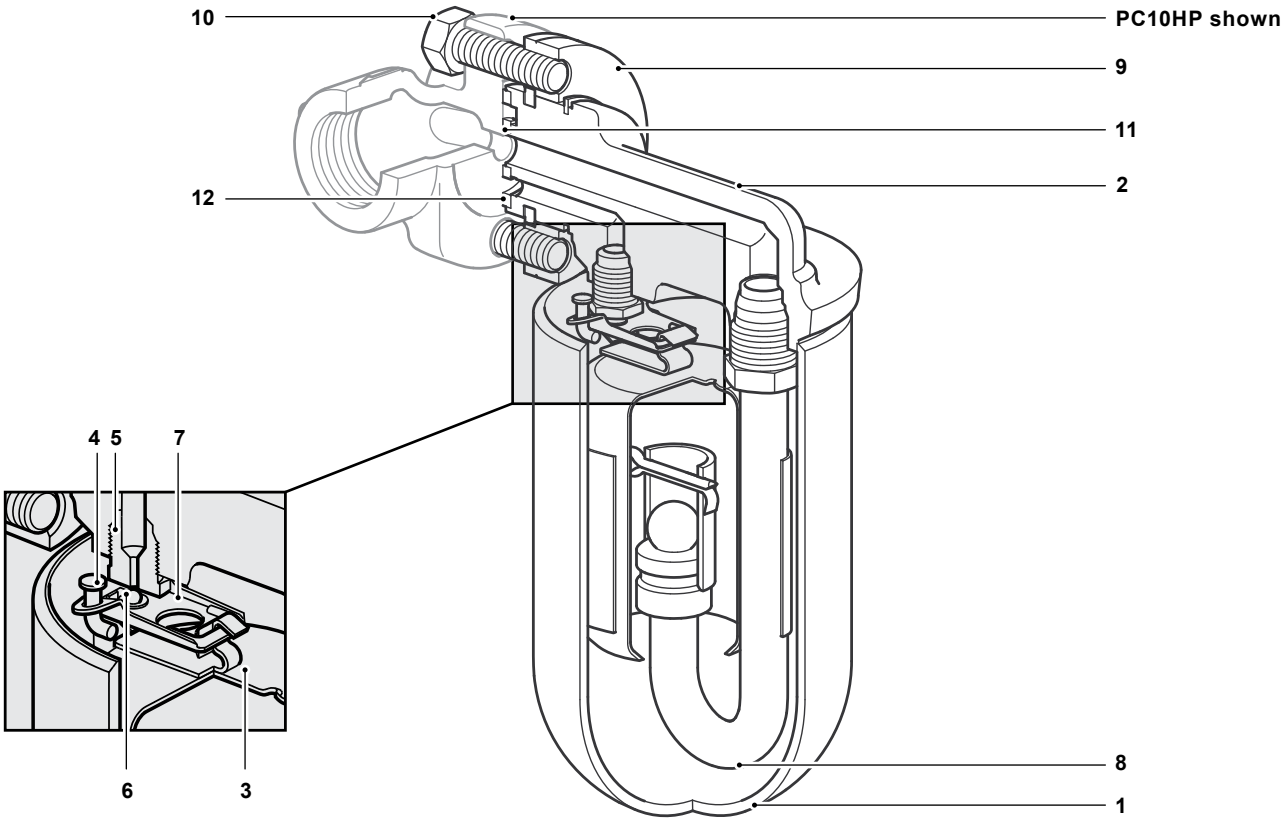


The product **must not** be used in this region.

Note: The model of pipeline connector and connections selected will dictate the maximum operating limits of the complete assembly. Reference the specific pipeline connector Technical Information sheet as detailed in 'Pipeline connector options'.

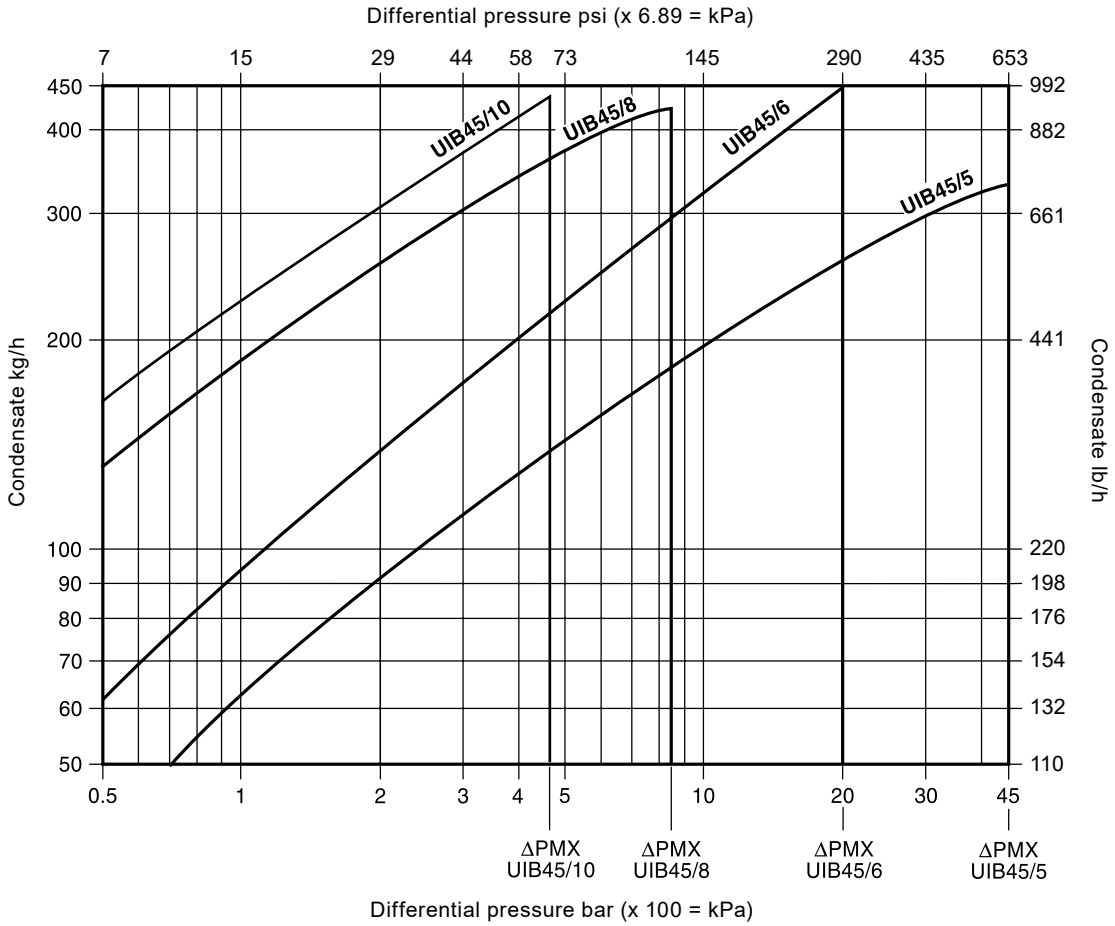
Body design conditions				ASME 600
PMA	Maximum allowable pressure		99.3 bar g @ 38 °C	1440 psi g @ 100 °F
TMA	Maximum allowable temperature		425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum allowable temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for saturated steam service		63 bar g	914 psi g
TMO	Maximum operating temperature		425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Δ PMX	Maximum differential pressure	**UIB45/5**	45.0 bar	653 psi
		UIB45/6	20.0 bar	290 psi
		UIB45/8	8.5 bar	123 psi
		UIB45/10	4.5 bar	65 psi
Designed for a maximum cold hydraulic test pressure of			149 bar g	2161 psi

Materials



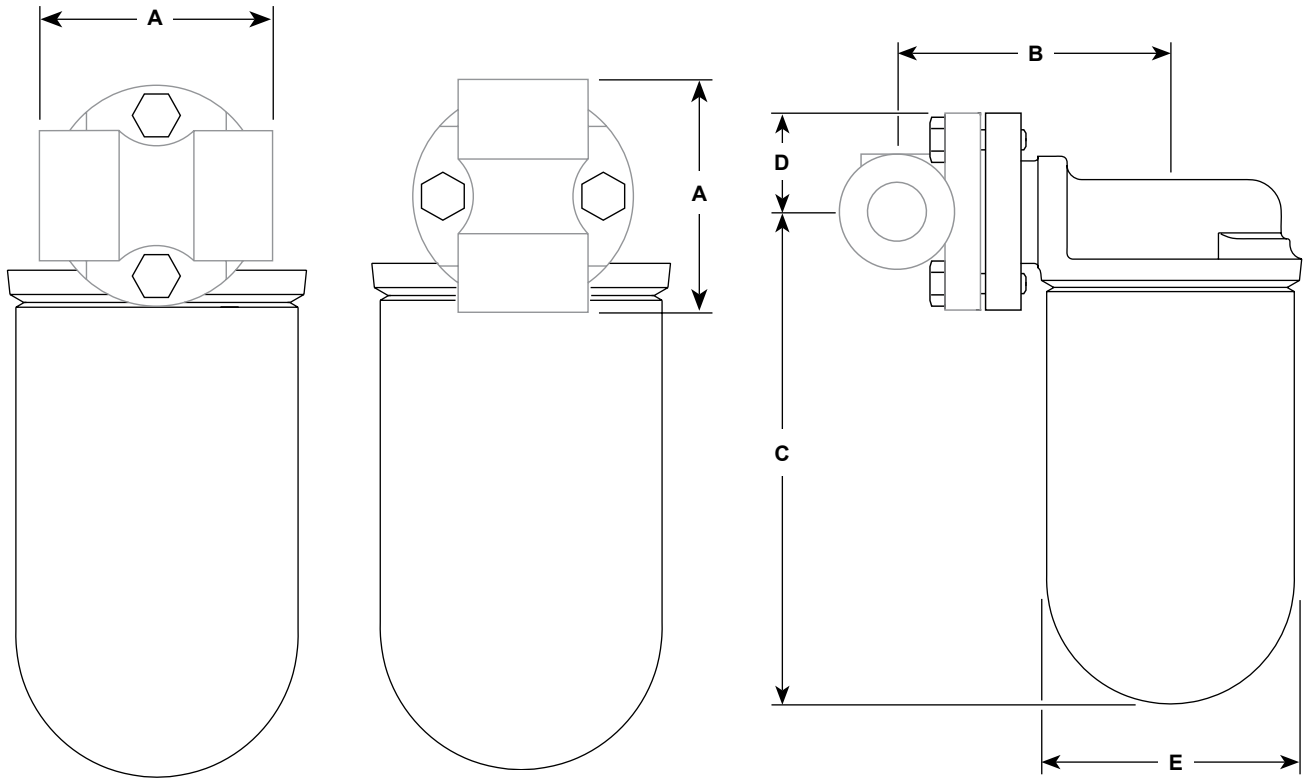
No.	Part	Material	
1	Cover	Stainless steel	ASTM A240 Gr. 304
2	Body	Stainless steel	ASTM A182 F304
3	Bucket	Stainless steel	BS 1449 304 S 12
4	Pivot pin	Stainless steel	BS 970 304 S 15
5	Valve seat	Stainless steel	AISI 440B
6	Valve	Stainless steel	AISI 440B
7	Valve lever	Stainless steel	BS 1449 304 S 16
8	Internal tube	Stainless steel	ASTM A269 304
9	Flange	Alloy steel - ELNP	ASTM A193 B7
10	Connector screw	Steel	ASTM A193 B7
11	Inlet gasket	Graphite / stainless steel laminate	AISI 304 strip
12	Outlet gasket	Graphite / stainless steel laminate	AISI 304 strip

Capacities



Note: Trap should be selected for the most appropriate working pressure differential and not on the basis of load. e.g. 80 kg/h at 7 bar (176 lb/h at 102 psi) differential should be handled with the UIB45/8 and not the UIB45/5.

Dimensions/weights (approximate) in mm (in) and kg (lb)



Size	A	B	C	D	E	Weight
DN15 - ½"	61.5 (2.4)	89 (3.5)	170 (6.7)	33.5 (1.3)	90 (3.5)	2.6 (5.7)
DN20 - ¾"	73.5 (2.9)	87 (3.4)				
DN25 - 1"	90.0 (3.5)	90.0 (3.5)				

Please note: The weights shown are for the trap only and do not include the pipeline connector.

How to order

The UIB45 is supplied in two parts:-

1.	**The swivel pipeline connector**	PC10HP	Straight connection
		PC20	Straight connection with 'Y' type strainer
		PC3_	Straight connection with one integral ISO valve
		PC4_	Straight connection with two integral ISO valves
2.	**The UIB45 trap** complete with inner and outer gaskets and two connector screws.		

Note: Any optional extras need to be specified at the time of order placement.

How to order example:
1 off ½" PC10HP straight connector having screwed NPT connections for use with a UIB45/5 sealed inverted bucket steam trap.
1 off UIB45/5 sealed inverted bucket steam trap complete with gaskets and connector screws.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P113-04) supplied with the product.

Installation note

The pipeline connector can be installed in either horizontal or vertical pipework.

DIsposal

The UIB45 trap unit is manufactured from stainless steel and is therefore totally recyclable. No ecological hazard is anticipated with the disposal of this product provided due care is taken.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Connector screw and gasket set	**10**, **11**, **12**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the type of trap.

Example: 1 - Connector screw and gasket set for a Spirax Sarco UIB45 sealed inverted bucket steam trap.

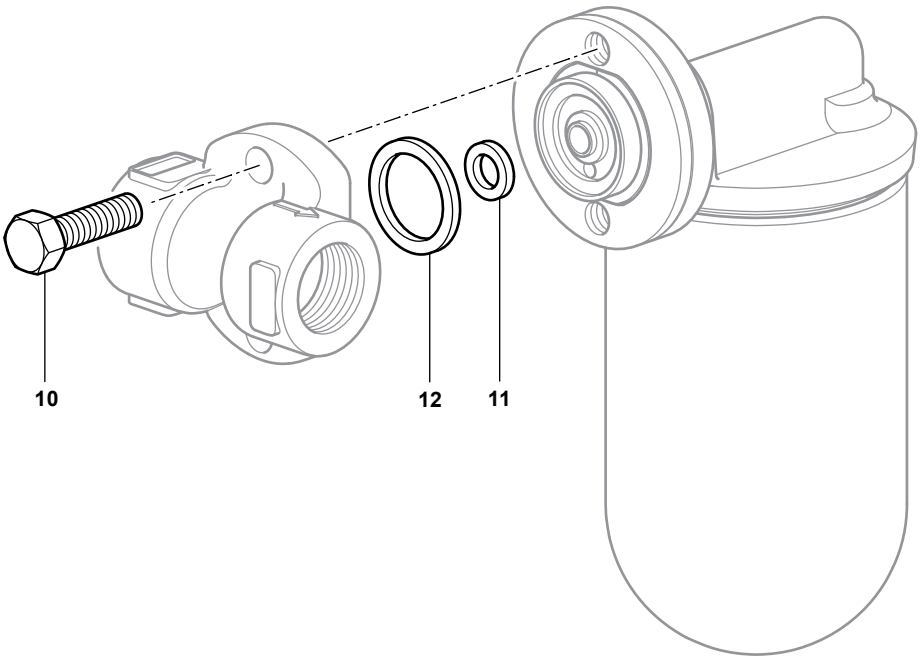


Table 1 Recommended tightening torques (for suitably lubricated threads)

Item	Part	mm	N m	ft-lbf
10	Connector screws	9/16" A/F	30 - 35	22 - 26

TI-P625-04
CMGT Issue 4

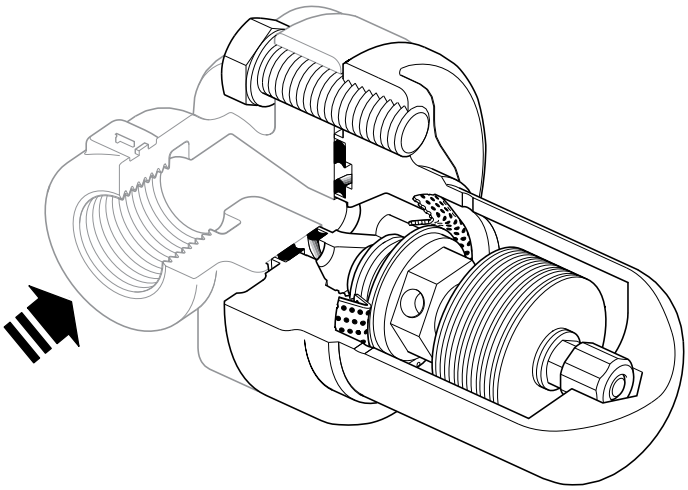
USM21
Sealed Bimetallic Steam Trap for use with Pipeline Connectors

Description
The USM21 is a pre-set and maintenance free sealed bimetallic steam trap manufactured in stainless steel. It is designed for steam pressures up to 21 bar (305 psi) and applications such as steam tracing and mains drips. When installed in any position with a suitable pipeline connector the USM21 can easily and simply be removed without breaking into the pipeline, thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available with screwed, socket weld and flanged connections.

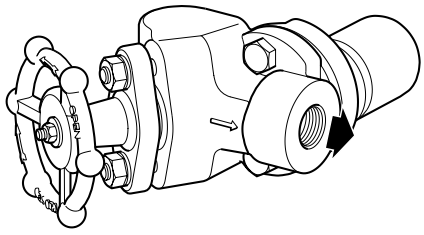
Standards
This product fully complies with the requirements of the Pressure Equipment Directive (PED) and carries the CE mark when so required.

Note: The body/cover weld joint complies with ASME section IX.

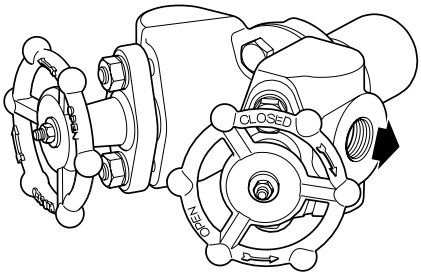
Certification
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.



USM21 fitted to a PC10HP connector



USM21 fitted to a PC3_ connector



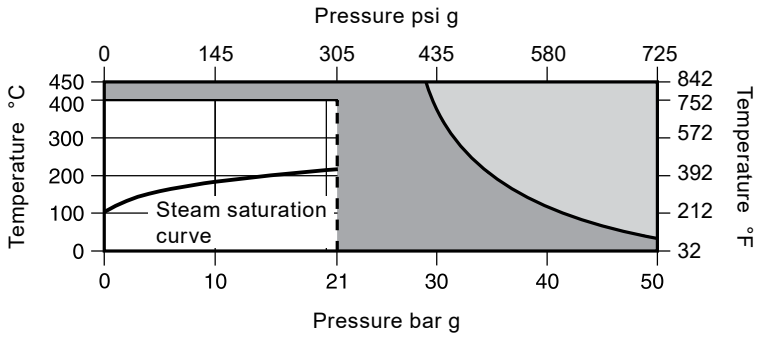
USM21 fitted to a PC4_ connector

Pipeline connector options
The USM can be fitted to a variety of pipeline connectors including:

PC10HP	Straight connector	ASME 600	(TI-P128-10)
PC20	+ 'Y' type strainer	ASME 300	(TI-P128-15)
IPC2_	+ 'Y' type strainer and Spiratec sensor		(TI-P128-17)
PC3_	+ 1 piston isolation valve	ASME 600	(TI-P128-02)
PC4_	+ 2 piston isolation valves	ASME 600	(TI-P128-03)

See the relevant Technical Information sheet as listed opposite for details of the connections available for each pipeline connector.

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

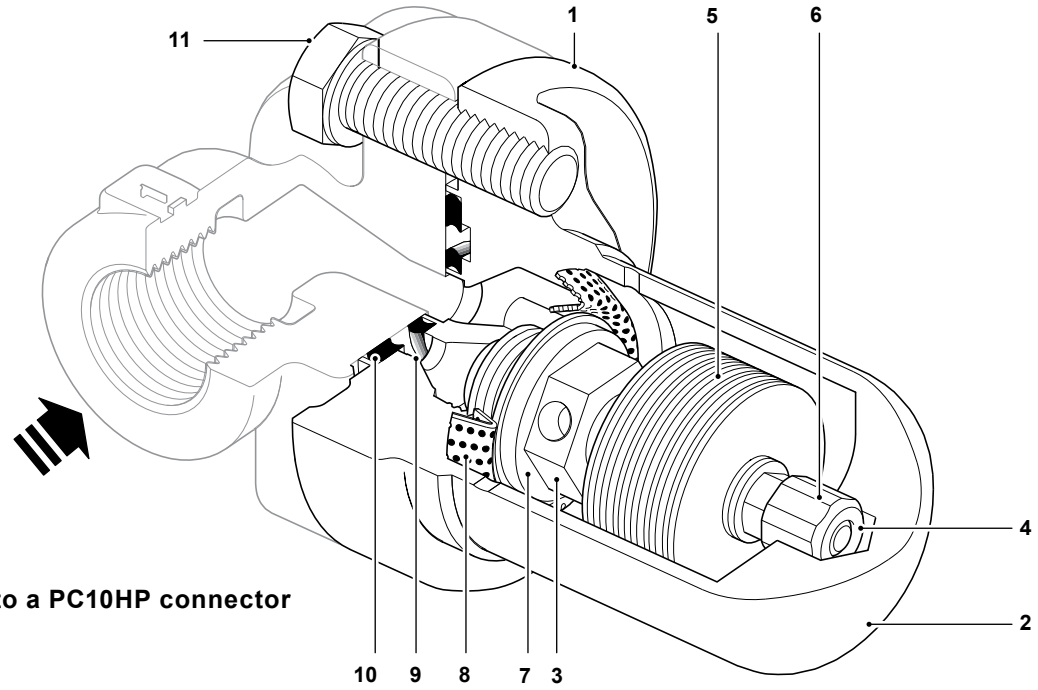
Note: The model of pipeline connector and connections selected will dictate the maximum operating pressure and temperature of the complete assembly. Consult the specified Technical Information sheet as listed in 'Sizes and pipe connections' for relevant data.

Body design conditions			ASME 300
PMA	Maximum allowable pressure	50 bar g @ 40 °C	725 psi g @ 104 °F
TMA	Maximum allowable temperature	450 °C @ 29 bar g	842 °F @ 421 psi g
Minimum allowable temperature		-29 °C	-20.2 °F
PMO	Maximum operating pressure for saturated steam service	21 bar g	305 psi g
TMO	Maximum operating temperature	400 °C @ 21 bar g	752 °F @ 305 psi g
Minimum operating temperature *		0 °C	32 °F
ΔPMX	Maximum differential pressure	21 bar	305 psi
Designed for a maximum cold hydraulic test pressure of		75 bar g	1088 psi

* Traps are available in a range of subcooled temperature settings.
Except for start-up and shutdown, they must operate above the minimum differential pressure values shown in the table below:

Nominal subcooled temperature		External identification	Threshold differential pressure	
-10 °C	-14 °F	'-1'	5 bar	73 psi
-30 °C	-22 °F	'-3'	2 bar	29 psi
-50 °C	-58 °F	'-5'	0.5 bar	7.25 psi
-70 °C	-94 °F	'-7'	0.1 bar	1.45 psi

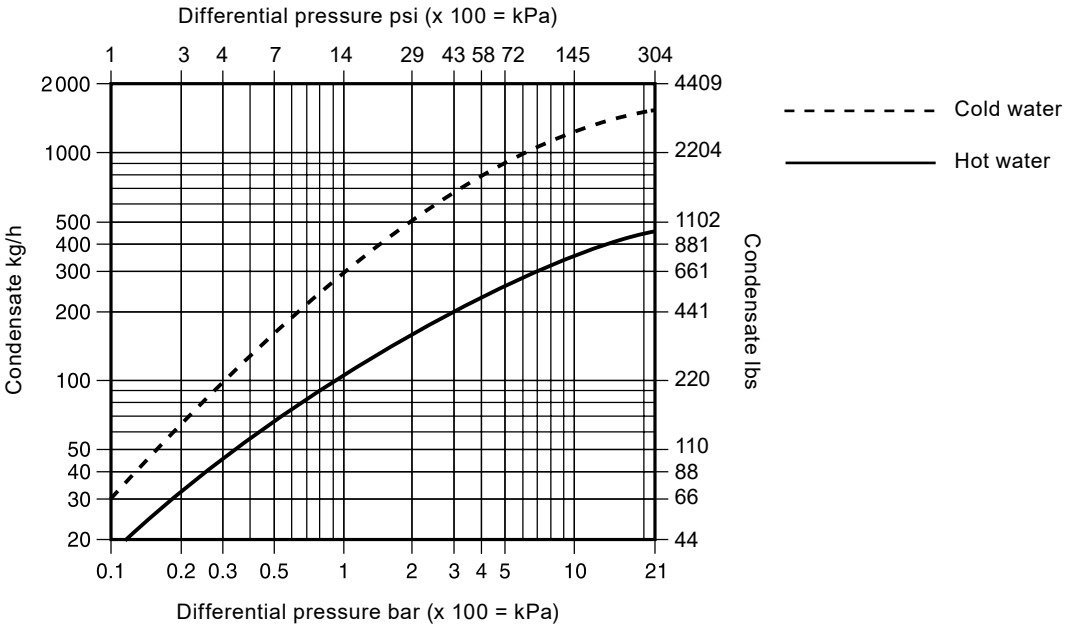
Materials



USM21 fitted to a PC10HP connector

No.	Part	Material	
1	Body	Stainless steel	ASTM A351 CF8M
2	Cover	Stainless steel	AISI 316L
3	Seat	Stainless steel	AISI 316L
4	Stem	Stainless steel	AISI 410
5	Bimetal	Nickel alloy	G. Rau H46
6	Lock-nuts	Stainless steel	AISI 304L
7	Body/seat gasket	Stainless steel	AISI 316L
8	Screen	Stainless steel	AISI 304L
9	Inner gasket	Stainless steel / Graphite filler	Spirally wound AISI 304 strip
10	Outer gasket	Stainless steel / Graphite filler	Spirally wound AISI 304 strip
11	Connector screws	Carbon steel	ASTM A193 B7

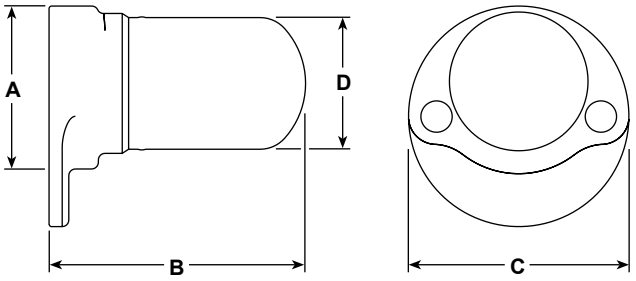
Capacities (in accordance with ISO 7842)



Dimensions/weights

(approximate) in mm (inches) and kg (lbs)

Model	A	B	C	D	Weight (Trap only)
USM21	35 (1.38)	78 (3.07)	68 (2.68)	40 (1.57)	0.6 (1.32)



How to specify

Steam traps shall be of the sealed bimetal thermostatic USM21 type manufactured in stainless steel and be suitable for operating pressures up to 21 bar 305 psi. Traps to be zero maintenance and to be connected to separate pipeline connectors by two screws for quick and simple installation/replacement.
The thermostatic element is to nominally operate at 10 °C, 30 °C, 50 °C or 70 °C (50 °F, 86 °F, 122 °F or 158 °F) below steam temperature. Traps can be installed in any plane.

How to order

The USM21 is supplied in two parts:-

1. The swivel pipeline connector	**PC10HP**	Standard connection
	PC20	+ 'Y' type strainer
	IPC2_	+ 'Y' type strainer and Spiratec sensor
	PC3_	+ 1 integral ISO valve
	PC4_	+ 2 integral ISO valves
2. The USM21 trap complete with inner and outer gaskets and two connector screws.		

Notes:

1. State the nominal subcooling temperature required.
2. Any optional extras need to be specified at the time of order placement.

How to order example:

1 off ½" PC10HP swivel connector having screwed NPT connections for use with a USM21 sealed bimetallic steam trap.

1 off Spirax Sarco USM21 sealed bimetallic steam trap, set to operate nominally at 30 °C (86 °F) below steam temperature.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P625-03) supplied with the product. The USM21 can be installed on any Spirax Sarco pipeline connector. See separate Installation and Maintenance Instructions for Spirax Sarco pipeline connectors (IM-P128-06, IM-P128-11 and IM-P128-13).

Disposal

The USM21 trap unit is manufactured from stainless steel and is therefore totally recyclable. No ecological hazard is anticipated with the disposal of this product provided due care is taken.

Spare parts

The USM21 is a sealed non-maintainable trap unit. No internal spares are available. The spares which are available are shown in heavy outline. Parts shown in a grey line are not available as spares.

Available spares

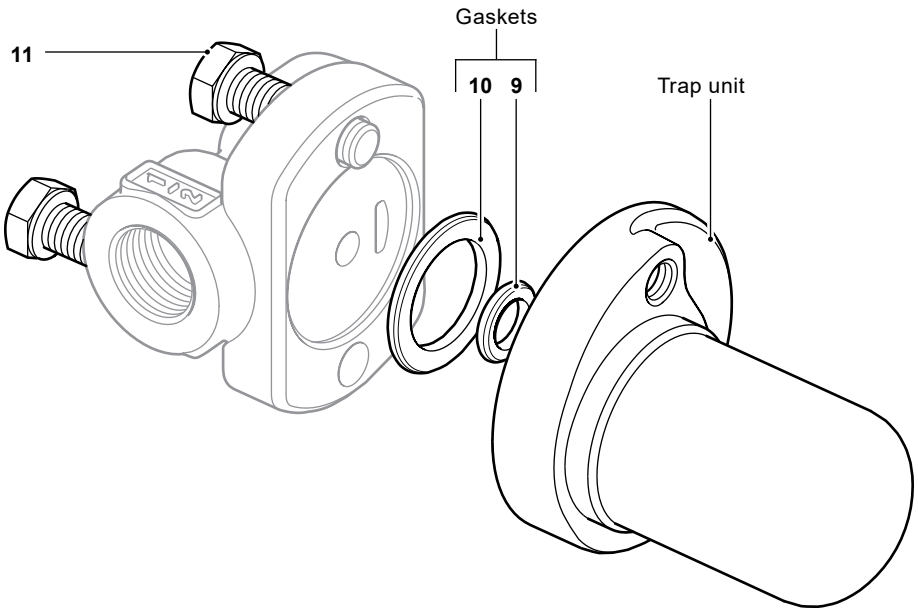
Connector screws (2 off)	**11**
Complete USM21 trap unit inclusive of gaskets (9 and 10) and connector screws (11)	

Note: The gaskets contain sharp metal reinforcement, please handle with care.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state if ordering a complete trap the nominal operating temperature of the steam trap.

Example: 2 off Connector screws for a USM21 sealed bimetallic steam trap.



Recommended tightening torques

Item	Part	or mm	N m
11	Connector screws	9/16"	33

TI-P625-11
CMGT Issue 6

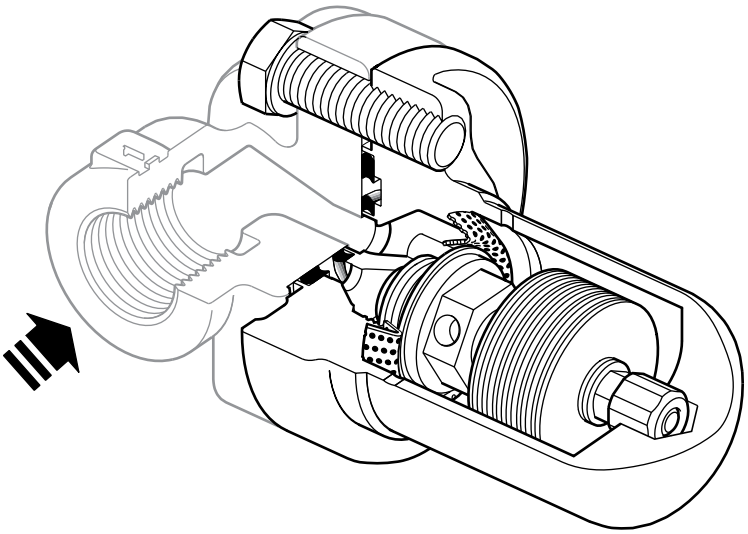
USM32
Sealed Bimetallic Steam Trap for use with Pipeline Connectors

Description
The USM32 is a pre-set and maintenance free sealed bimetallic steam trap manufactured in stainless steel. It is designed for steam pressures up to 32 bar (464 psi) and applications such as steam tracing and mains drips. When installed in any position with a suitable pipeline connector the USM32 can easily and simply be removed without breaking into the pipeline, thus speeding up trap replacement with minimal system downtime. Pipeline connectors are available with screwed, socket weld and flanged connections.

Standards
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU and carries the CE mark when so required.

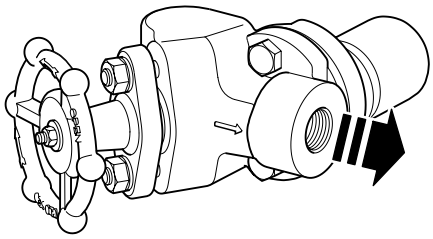
Note: The body/cover weld joint complies with ASME section IX.

Certification
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

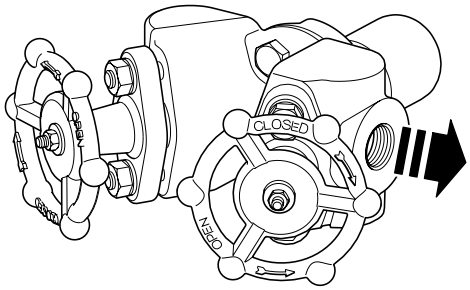


USM32 fitted to a PC10HP connector

USM32 fitted to a PC3_ connector



USM32 fitted to a PC4_ connector

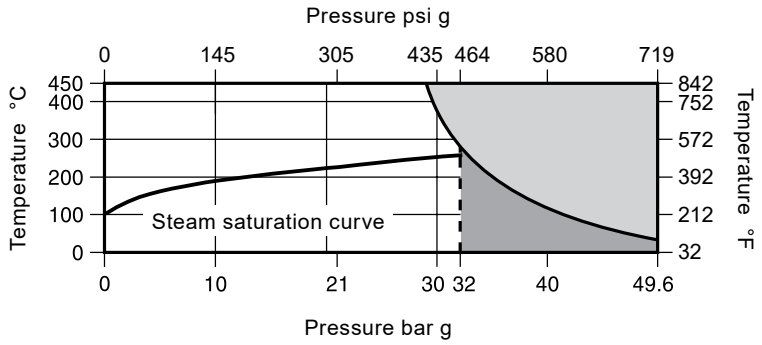


Pipeline connector options
The USM can be fitted to a variety of pipeline connectors including:

PC10HP	Straight connector	ASME 600	(TI-P128-10)
PC20	+ 'Y' type strainer	ASME 300	(TI-P128-15)
IPC2_	+ 'Y' type strainer and Spiratec sensor		(TI-P128-17)
PC3_	+ 1 piston isolation valve	ASME 600	(TI-P128-02)
PC4_	+ 2 piston isolation valves	ASME 600	(TI-P128-03)

See the relevant Technical Information sheet as listed above for details of the connections available for each pipeline connector.

Pressure/temperature limits (ISO 6552)



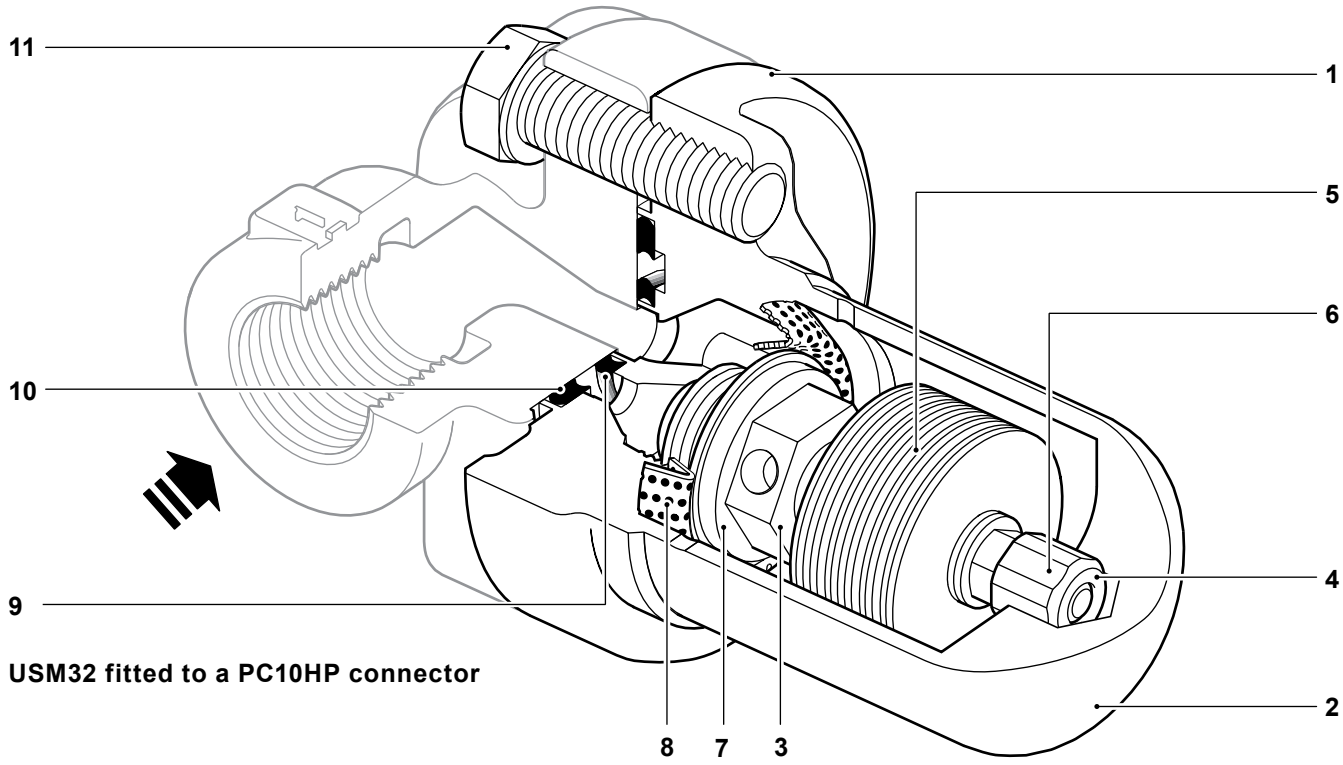
The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Note: The model of pipeline connector and connections selected will dictate the maximum operating pressure and temperature of the complete assembly. Consult the specified Technical Information sheet as listed in 'Sizes and pipe connections' for relevant data.

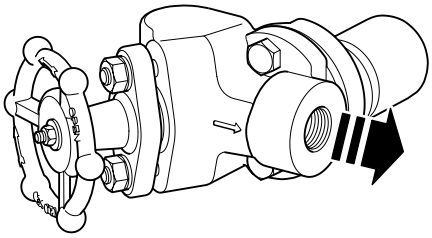
Body design conditions			ASME 300
PMA	Maximum allowable pressure	49.6 bar g @ 38 °C	719 psi g @ 100 °F
TMA	Maximum allowable temperature	450 °C @ 28.8 bar g	842 °F @ 418 psi g
Minimum allowable temperature		-29 °C	-20 °F
PMO	Maximum operating pressure for saturated steam service	32 bar g	464 psi g
TMO	Maximum operating temperature	400 °C @ 28.8 bar g	752 °F @ 418 psi g
Minimum operating temperature		0 °C	32 °F
Minimum operating pressure		1 bar g	15 psi g
ΔPMX	Maximum differential pressure	32 bar	464 psi
Product is safe for use under full vacuum conditions			
Designed for a maximum cold hydraulic test pressure of		75 bar g	1088 psi g

Materials

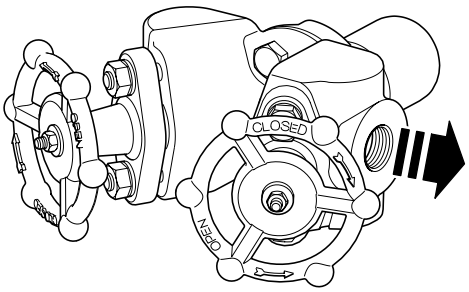


USM32 fitted to a PC10HP connector

USM32 fitted to a PC3_ connector

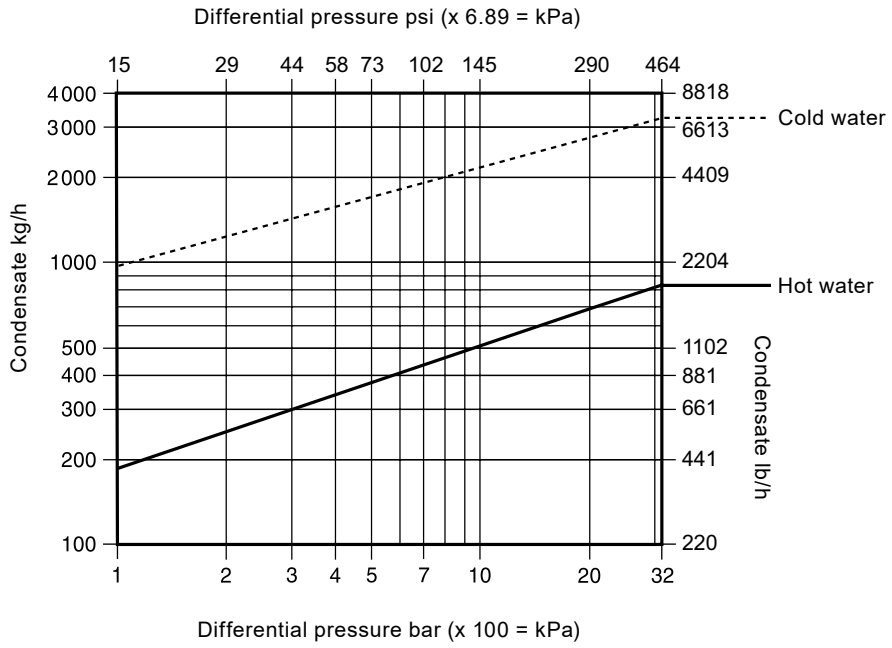


USM32 fitted to a PC4_ connector



No.	Part	Material	
1	Body	Stainless steel	ASTM A351 CF8M
2	Cover	Stainless steel	AISI 316L
3	Seat	Stainless steel	AISI 304
4	Stem	Stainless steel	AISI 304
5	Bimetal	Nickel alloy	G. Rau H46
6	Lock-nuts	Stainless steel	AISI 304L
7	Body/seat gasket	Stainless steel	AISI 316L
8	Screen	Stainless steel	AISI 304L
9	Inner gasket	Stainless steel / Graphite filler	AISI 304 strip
10	Outer gasket	Stainless steel / Graphite filler	AISI 304 strip
11	Connector screws	Carbon steel	ASTM A193 B7

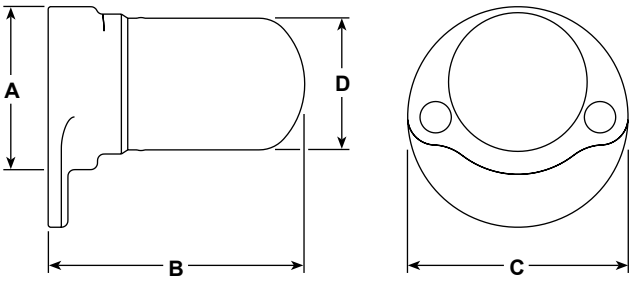
Capacities (in accordance with ISO 7842)



Dimensions/weights

(approximate) in mm (in) and kg (lb)

A	B	C	D	Weight (Trap only)
35 (1.4)	88 (3.5)	67 (2.6)	40 (1.6)	0.6 (1.3)



How to specify

Steam traps shall be of the sealed bimetal thermostatic USM32 type manufactured in stainless steel and be suitable for operating pressures up to 32 bar. Traps to be zero maintenance and to be connected to separate pipeline connectors by two screws for quick and simple installation/replacement. The thermostatic element is to nominally operate at 30 °C below steam temperature. Traps can be installed in any plane.

How to order

The USM32 is supplied in two parts:-

1. The swivel pipeline connector	**PC10HP**	Standard connection
	PC20	+ 'Y' type strainer
	IPC2_	+ 'Y' type strainer and Spiratec sensor
	PC3_	+ 1 integral ISO valve
	PC4_	+ 2 integral ISO valves
2. The USM32 trap complete with inner and outer gaskets and two connector screws.		

Notes: **1.** State the nominal subcooling temperature required.

2. Any optional extras need to be specified at the time of order placement.

How to order example:

1 off ½" PC10HP swivel connector having screwed NPT connections for use with a USM32 sealed bimetallic steam trap.
1 off Spirax Sarco USM32 sealed bimetallic steam trap, set to operate nominally at 30 °C below steam temperature.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P625-10) supplied with the product. The USM32 can be installed on any Spirax Sarco pipeline connector. See separate Installation and Maintenance Instructions for Spirax Sarco pipeline connectors (IM-P128-06, IM-P128-11 and IM-P128-13).

Disposal

The USM32 trap unit is manufactured from stainless steel and is therefore totally recyclable. No ecological hazard is anticipated with the disposal of this product provided due care is taken.

Spare parts

The USM32 is a sealed non-maintainable trap unit. No internal spares are available.
The spares which are available are shown in heavy outline. Parts shown in a grey line are not available as spares.

Available spares

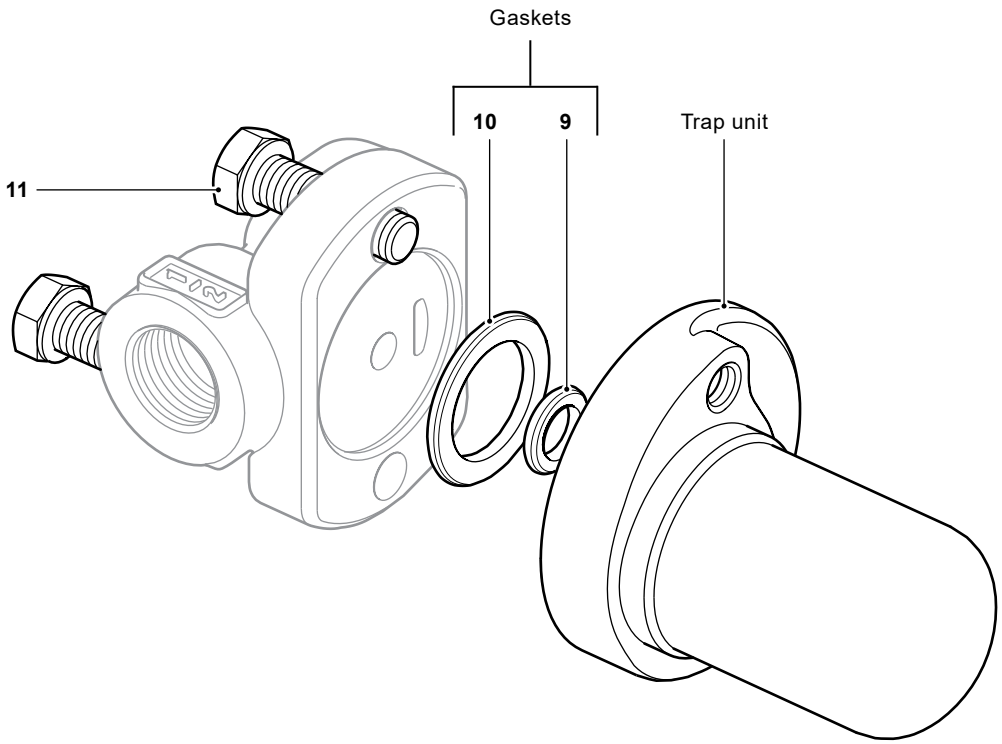
Connector screws (2 off)	**11**
Complete USM32 trap unit inclusive of gaskets (**9** and **10**) and connector screws (**11**)	

Note: The gaskets contain sharp metal reinforcement, please handle with care.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state if ordering a complete trap the nominal operating temperature of the steam trap.

Example: 2 off Connector screws for a USM32 sealed bimetallic steam trap.



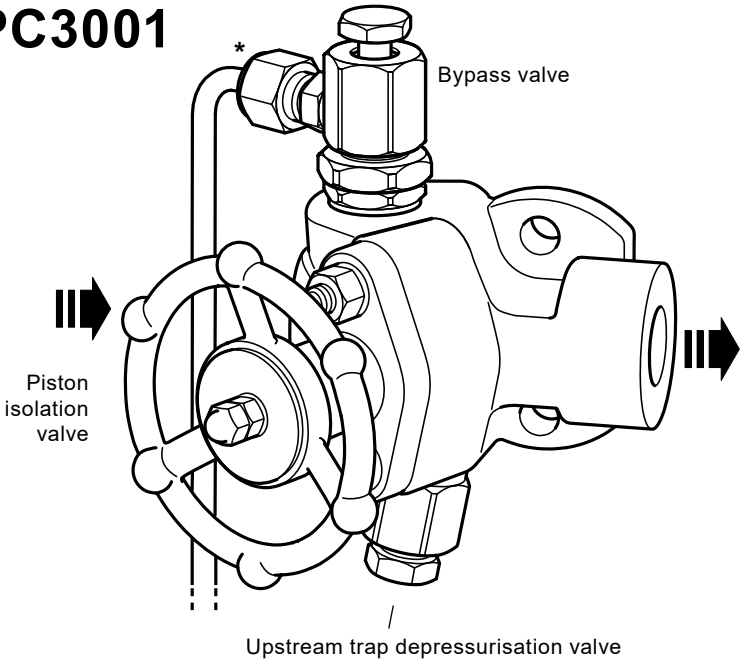
Recommended tightening torques

Item	Part	or mm	N m	ft-lbf
11	Connector screws	9/16"	33	24

TI-P128-34
CMGT Issue 7

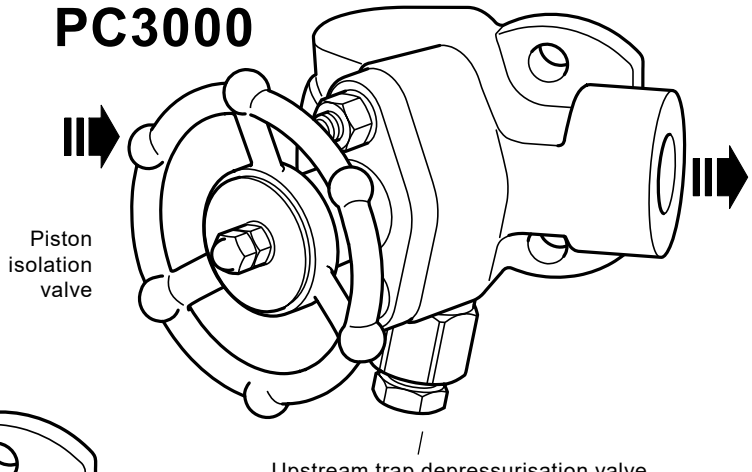
PC3001, PC3000 and PC30 Pipeline Connectors

PC3001

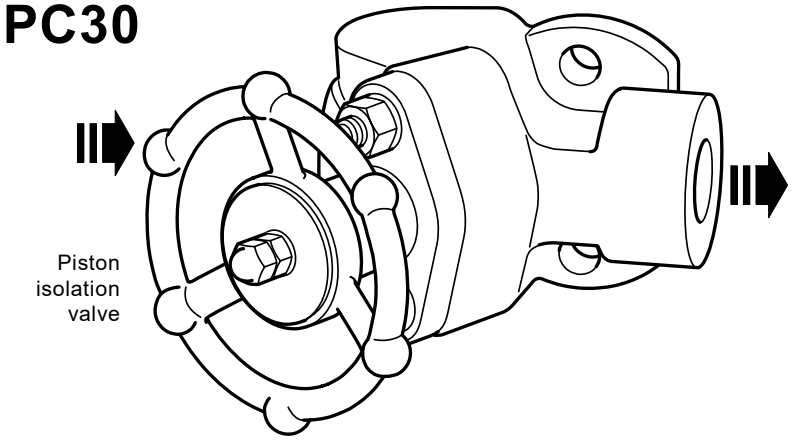


* **Please note** that the line drain outlet is shown out of position for clarity and that the line drain pipework is to be supplied by the customer.

PC3000



PC30



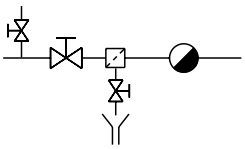
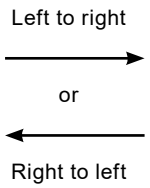
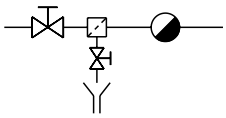
Description

The PC3001, PC3000 and PC30 range of pipeline connectors are designed for use with two bolt universal swivel connector steam traps. Incorporating one integral piston stop valve, it is possible to isolate upstream of the steam trap.

PC3001 and PC3000 models only

The trap depressurisation port also incorporates a maintainable 40 mesh stainless steel strainer screen to provide trap protection from system dirt and debris. The PC3001 is also fitted with a bypass/line drain valve upstream of the isolation valve.

Available types

Model	Valve connections	P and ID diagram	Flow direction
PC3001	1 x Piston isolation valves 1 x Upstream trap vent valve 1 x Bypass valve		
PC3000	1 x Piston isolation valves 1 x Upstream trap vent valve		
PC30	No valve connections		

For available options to the pipeline connections detailed within this Technical Information sheet please reference TI-F01-37.

Standards

These products fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

These products are available with certification to EN 10204 3.1.
Note: All certification / inspection requirements must be stated at the time of order placement. For other certification contact Spirax Sarco.

Sizes and pipe connections

DN15 and DN20 condensate inlet/outlet connections are available with screwed BSP T Rp (ISO 7-1) or NPT and as a socket weld connection to ASME B16.11 class 3000. Drainage and venting connections have an M18 thread as standard.

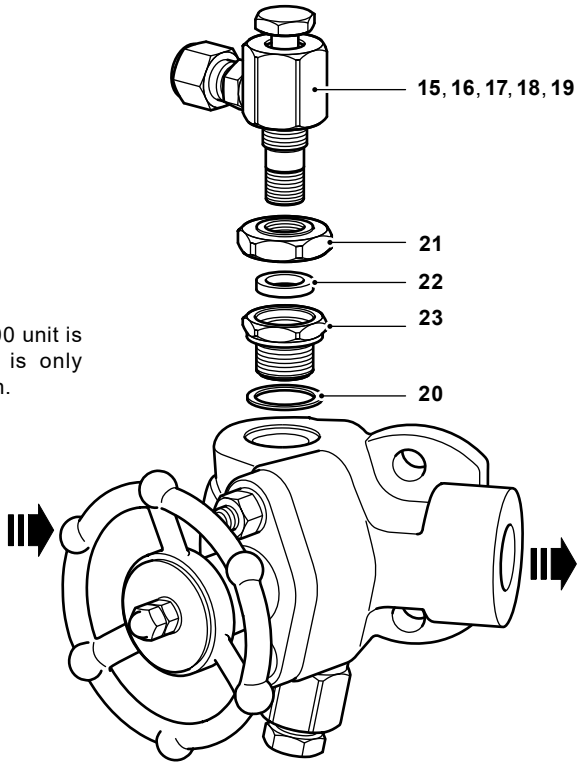
Flanged versions are also available upon request. Please contact Spirax Sarco for further details.

How to order

Example: 1 off ½" Spirax Sarco PC3001 pipeline connector having right to left flow and socket weld end connections to ASME B 16.11 Class 3000.

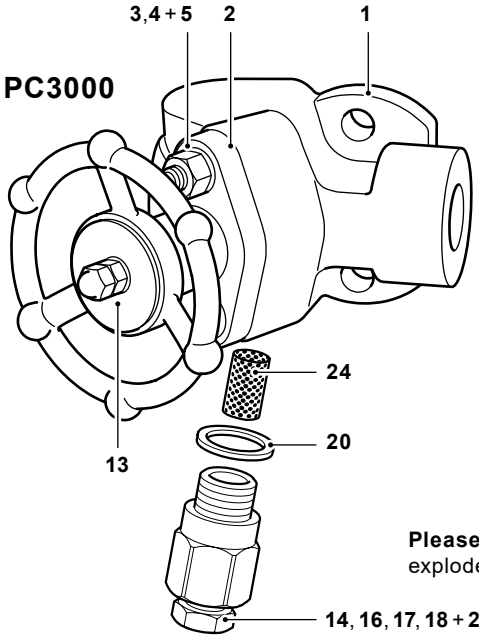
Materials - PC3001

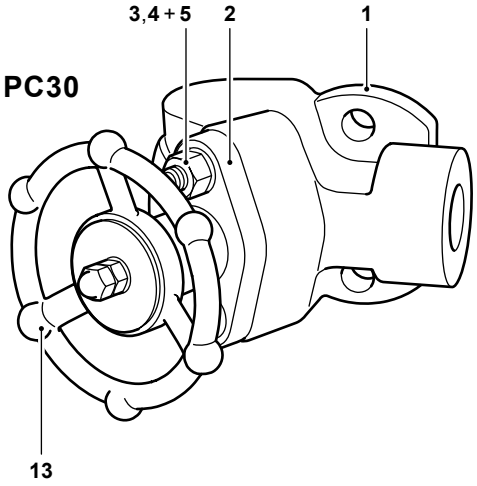
Please note The PC3001 and PC3000 unit is supplied fully assembled; the view is only exploded for ease of part identification.



No.	Part	Material	
15	Bypass valve	Stainless steel	ASTM A182 : 304/304L
16	Valve screw	Stainless steel	ASTM A276 : AISI 431
17	Valve cone	Stainless steel	AISI 440 B
18	Retaining ring	Stainless steel	BS 2056 302 S26
19	Compression fitting for the line drain valve only	Carbon steel (Zinc plated)	
20	Valve gasket	Graphite and stainless steel	
21	Bypass locknut	Stainless steel	ASTM A276 : AISI 431
22	Graphite ring	Die-formed graphite	
23	Bypass bottom body	Stainless steel	ASTM A182 304/304L

Materials - PC3000 and PC30



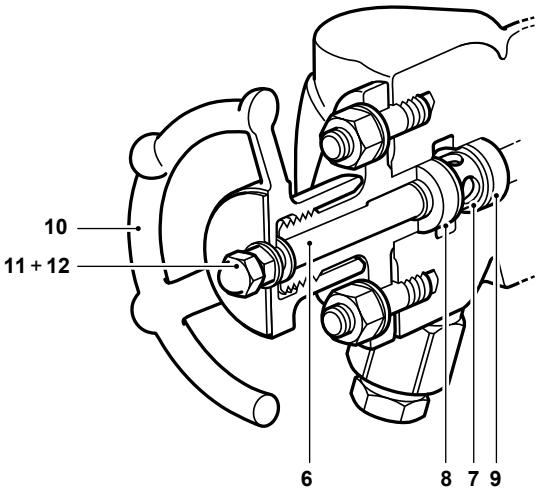


Please note The PC3001 and PC3000 unit is supplied fully assembled; the view is only exploded for ease of part identification.

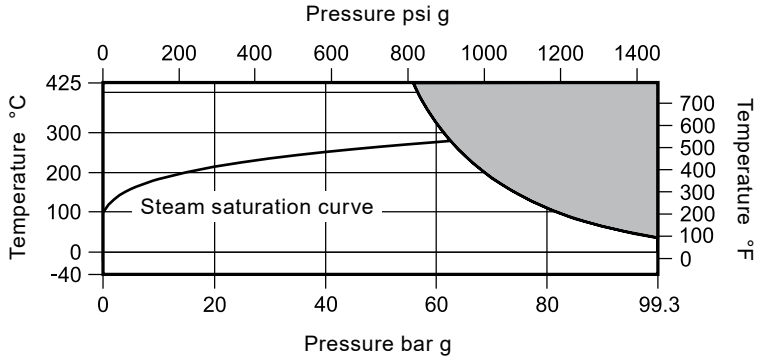
No.	Part	Material	
1	Pipeline connector body	Austenitic stainless steel	ASTM A182F : 304/304L
2	Bonnet	Carbon steel (Zinc plated)	ASTM A105N/LF2
3	Studs	Steel (plated)	ASTM A193 B7
4	Nuts	Steel (plated)	ASTM A194 2H
5	Washers	Stainless steel	
13	Name-plate	Stainless steel	
14	Depressurisation valve	Stainless steel	ASTM A182 : 304/304L
16	Valve screw	Stainless steel	ASTM A276 : AISI 431
17	Valve cone	Stainless steel	AISI 440 B
18	Retaining ring	Stainless steel	BS 2056 302 S26
20	Valve gasket	Graphite and stainless steel	
24	Strainer screen	Stainless steel	

Valve internal materials

No.	Part	Material	
6	Piston	Stainless steel	AISI 410 : 1.4006
7	Lantern bush	Stainless steel	ASTM A276 : AISI 431
8	Upper ring	Graphite and stainless steel	
9	Lower ring	Graphite and stainless steel	
10	Handwheel	Carbon steel (Zinc plated)	EN 10213 : 1.0619N
11	Handwheel nuts	Stainless steel	
12	Nitronic 60 washers	Stainless steel	



Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection - See notes below.

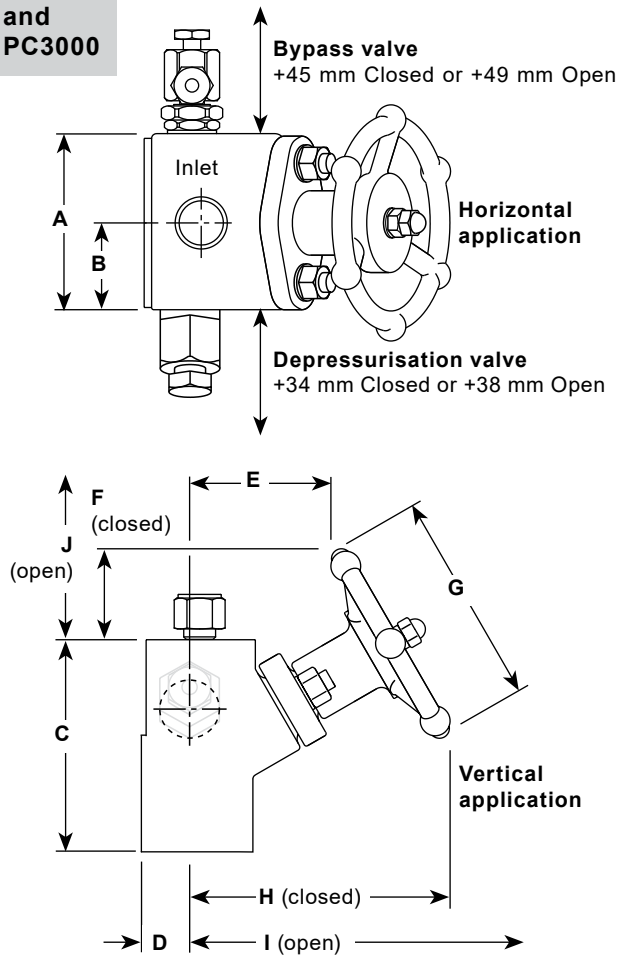
Body design condition		ASME 600
PMA Maximum allowable pressure	99.3 bar g @ 38 °C	1 440 psi g @ 100 °F
TMA Maximum allowable temperature	425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum allowable temperature	-46 °C	-51 °F
PMO Maximum operating pressure for saturated steam service	62 bar g @ 279 °C	899 psi g @ 534 °F
TMO Maximum operating temperature	425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum operating temperature	-46 °C	-51 °F
Product is safe for use under full vacuum conditions		
Designed for a maximum cold hydraulic test pressure of:	150 bar g	2 175 psi g

Notes:

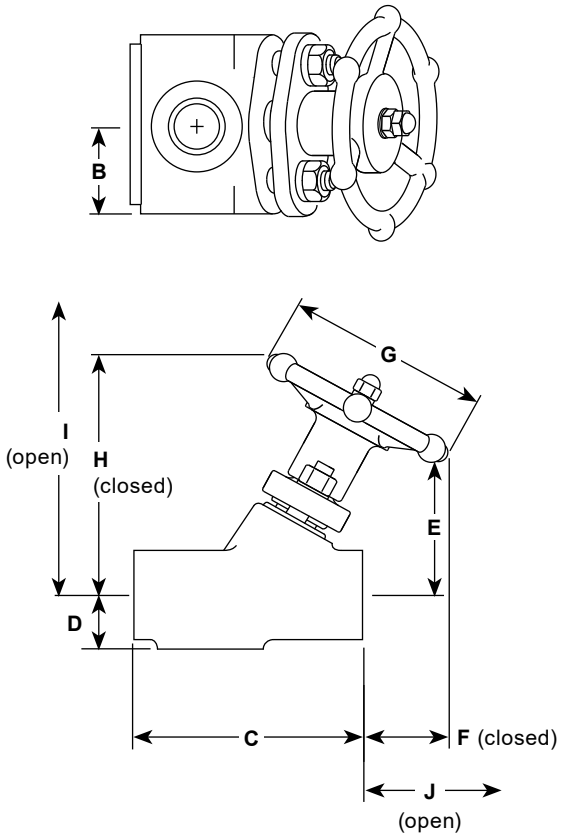
1. If flange connections are fitted then these will limit the maximum and minimum design conditions of the pipeline connector.
2. The maximum operating limits of the complete assembly will be dictated by the steam trap of choice. Reference the specific steam trap technical information sheet for its 'Pressure / temperature limits'.

Dimensions/weight (approximate mm (inches) and kg (lbs))

PC3001 and PC3000



PC30



Units		A	B	C	D	E	F	G	H	I	J	Weight
Metric	mm	72	36	96	25	52	37	95	100	118	50	3.6 kg
Imperial	inches	2.8"	1.4"	3.8"	1"	2"	1.5"	3.7"	3.9"	4.64"	1.97"	7.9 lbs

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P128-35) supplied with the product.

General information

There are two criteria which must be satisfied to ensure that the swivel connector trap will operate correctly and ensure effective condensate removal:

1. The PC3001, PC3000 and PC30 shall be installed with flow in the direction of the arrow on the connector body. Flow can be horizontal (left to right or right to left), vertical or inclined.
2. The connection face for the swivel connector steam trap must be in the vertical plane unless stated on relevant steam trap Installation and Maintenance Instructions.

After installation it is recommended that the pipeline connector is insulated to minimise radiated heat losses and to protect personnel from burns risk: Please note that some steam trap types should not be insulated.

Depressurisation and line drainage

The PC30001 and PC3000 assemblies are supplied fitted with valve(s) which allow depressurisation of the system to enable safe removal and maintenance of the steam trap. The PC3001 is also supplied with bypass valve fitted, however consideration must be given to the position of the discharge which should be directed or piped to a safe place where it will not injure personnel or damage equipment.
PC30 only - Following isolation slightly loosen the trap bolts to ensure the full release of hot steam and condensate prior to commencing work. Safety equipment should be used and care taken to avoid potential injury.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in grey line are not supplied as spares. For ease of replacement an extractor tool is available for removing the sealing rings.

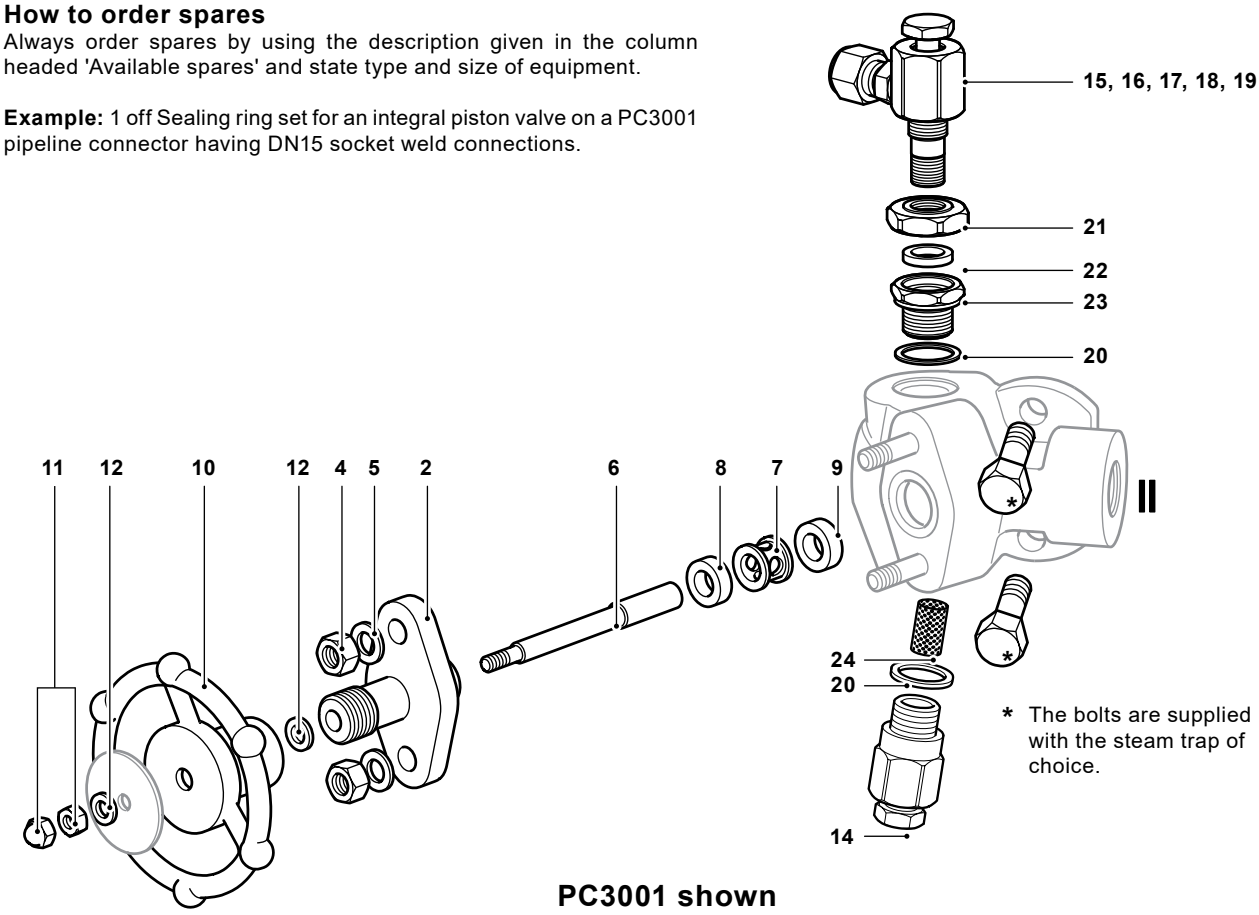
Available spares

Sealing ring set	**8** and **9**
Piston valve assembly	**2**, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11** and **12**
Piston valve sub-assembly	**6**, **7**, **8** and **9**
Extractor tool	Not shown
PC depressurisation valve and gasket	**14** and **20**
PC bypass valve assembly and gasket	**15, 16, 17, 18, 19, 20, 21, 22** and **23**
Strainer screen and gasket (pack of 3)	**20** and **24**
Valve gasket set (pack of 10)	**20**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state type and size of equipment.

Example: 1 off Sealing ring set for an integral piston valve on a PC3001 pipeline connector having DN15 socket weld connections.



* The bolts are supplied with the steam trap of choice.

PC3001 shown

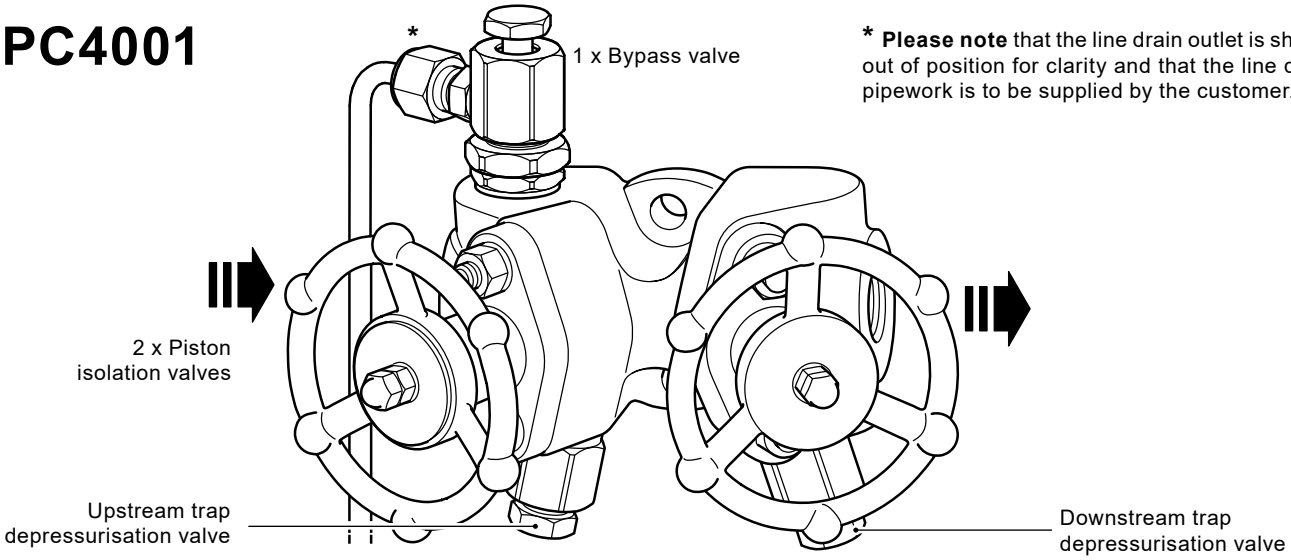
Recommended tightening torques

Item	or mm		N m	ft lbf
4	14	5/16" x 18 UNC	12.0	9
11	10	M6	12.0	9
14 and 23	24	M18	74 - 78	55 - 58
21	27	M14	45-50	33-37

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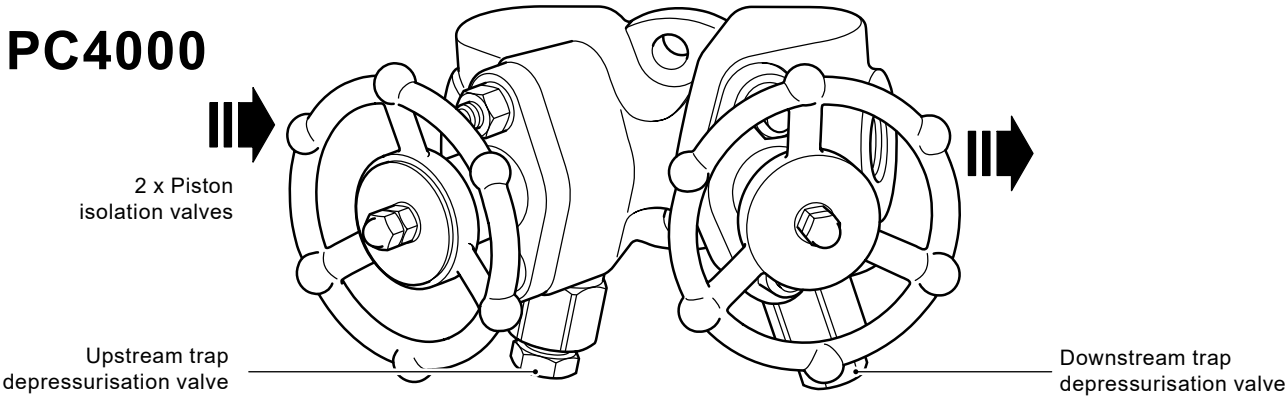
PC4001, PC4000 and PC40 Pipeline Connectors

PC4001

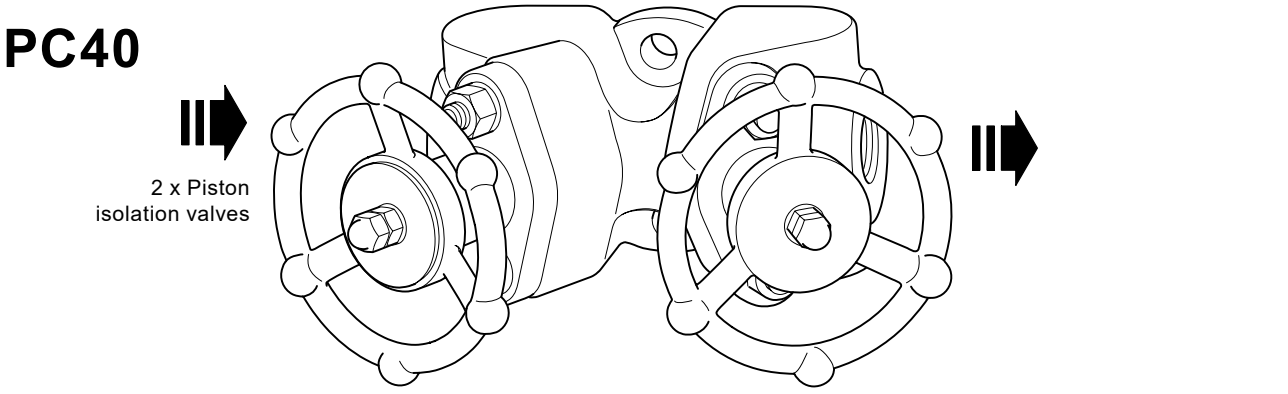


* **Please note** that the line drain outlet is shown out of position for clarity and that the line drain pipework is to be supplied by the customer.

PC4000



PC40



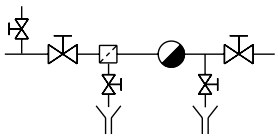
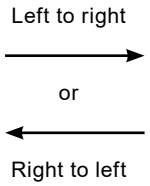
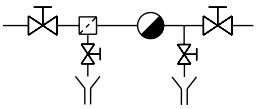
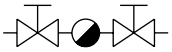
Description

The PC4001, PC4000 and PC40 range of pipeline connectors are a complete 'Trap valve station solution' developed for use with two bolt universal swivel connector steam traps.
As the unit has been designed with two integral piston stop valves, it is possible to isolate both upstream and downstream of the universal trap connection.

PC4001 and PC4000 models only

Through the use of the fitted depressurisation valves it is possible to depressurise, test and drain the pipeline.
The trap depressurisation port also incorporates a maintainable 40 mesh stainless steel strainer screen to provide trap protection from system dirt and debris, which can be cleared through the use of the line pressure.

Available types

Model	Valve connections	P and ID diagram	Flow direction
PC4001	2 x Piston isolation valves 1 x Upstream trap depressurisation valve 1 x Downstream trap depressurisation valve 1 x Bypass valve		
PC4000	2 x Piston isolation valves 1 x Upstream trap depressurisation valve 1 x Downstream trap depressurisation valve		
PC40	No valve connections		

For available options to the pipeline connections detailed within this Technical Information sheet please reference TI-F01-37.

Standards - These products fully comply with the requirements of the Pressure Equipment Directive (PED).

Certification - These products are available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement. For other certification contact Spirax Sarco.

Sizes and pipe connections

DN15 (½") and DN20 (¾") condensate inlet/outlet connections are available with screwed BSP or NPT and as a socket weld connection to ASME B16.11 class 3000. Drainage and venting connections have an M18 thread as standard.

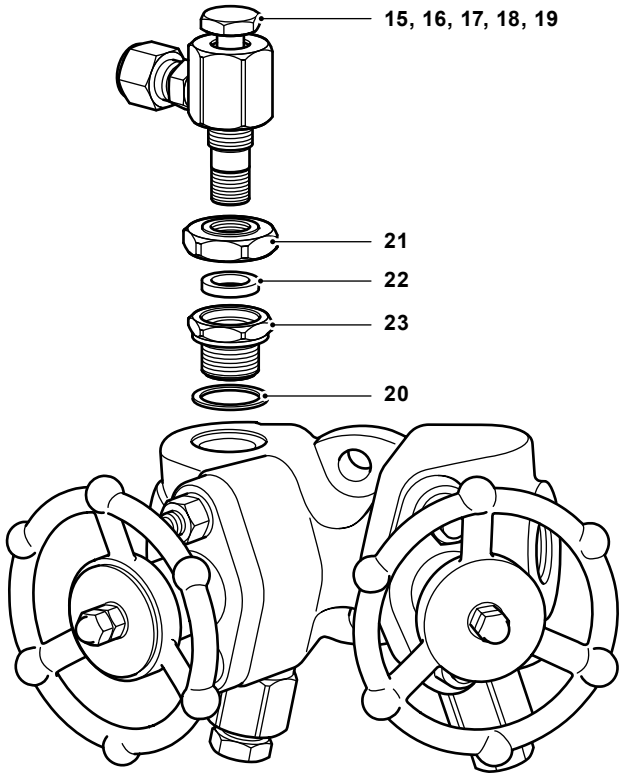
Flanged versions are also available upon request. Please contact Spirax Sarco for further details.

How to order

Example: 1 off ½" Spirax Sarco PC4001 pipeline connector having right to left flow and socket weld end connections to ASME B 16.11 Class 3000.

PC4001 Materials

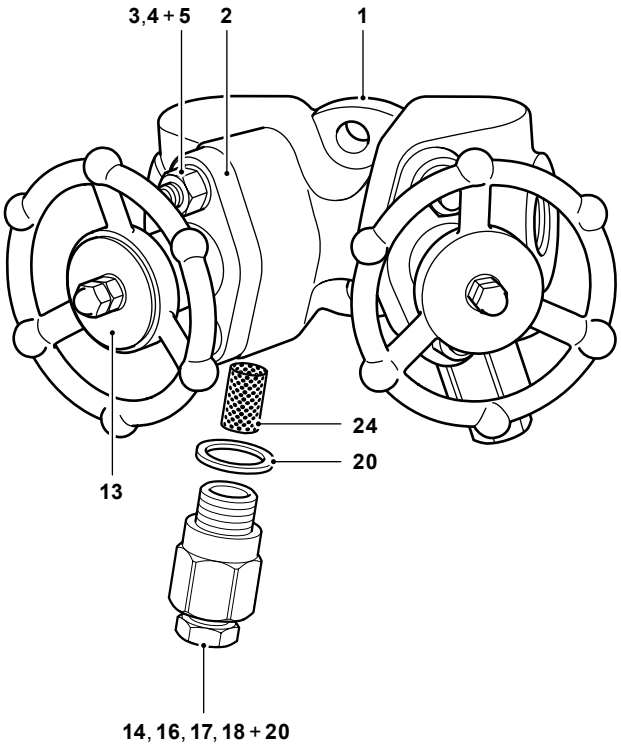
No.	Part	Material	
15	Bypass valve	Stainless steel	ASTM A182 : 304/304L
16	Valve screw	Stainless steel	ASTM A276 : AISI 431
17	Valve cone	Stainless steel	AISI 440 B
18	Retaining ring	Stainless steel	BS 2056 302 S26
19	Compression fitting for the line drain valve only	Carbon steel (Zinc plated)	
20	Valve gasket	Graphite and stainless steel	
21	Bypass locknut	Stainless steel	ASTM A276 : AISI 431
22	Graphite ring	Die-formed graphite	
23	Bypass bottom body	Stainless steel	ASTM A182 304/304L



Please note that the PC4001 and PC4000 unit is supplied fully assembled; the view is only exploded for ease of part identification.

PC4000 Materials

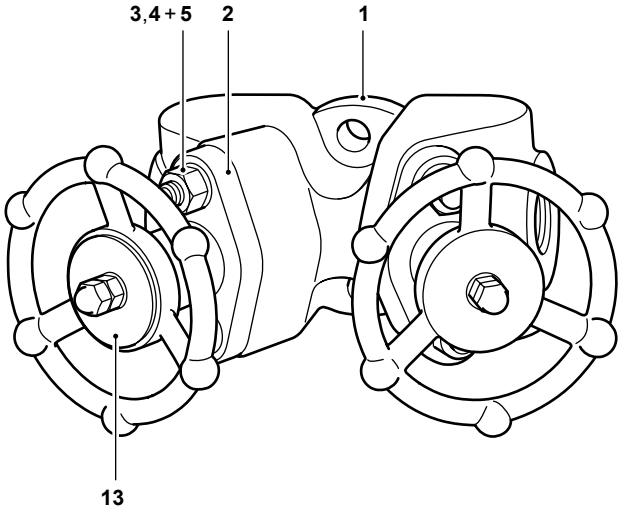
No.	Part	Material	
1	Pipeline connector body	Austenitic stainless steel	ASTM A182F : 304/304L
2	Bonnet	Carbon steel (Zinc plated)	ASTM A105N/LF2
3	Studs	Steel (plated)	ASTM A193 B7
4	Nuts	Steel (plated)	ASTM A194 2H
5	Washers	Stainless steel	
13	Name-plate	Stainless steel	
14	Depressurisation valve	Stainless steel	ASTM A182 : 304/304L
16	Valve screw	Stainless steel	ASTM A276 : AISI 431
17	Valve cone	Stainless steel	AISI 440 B
18	Retaining ring	Stainless steel	BS 2056 302 S26
20	Valve gasket	Graphite and stainless steel	
24	Strainer screen	Stainless steel	



Please note that the PC4001 and PC4000 unit is supplied fully assembled; the view is only exploded for ease of part identification.

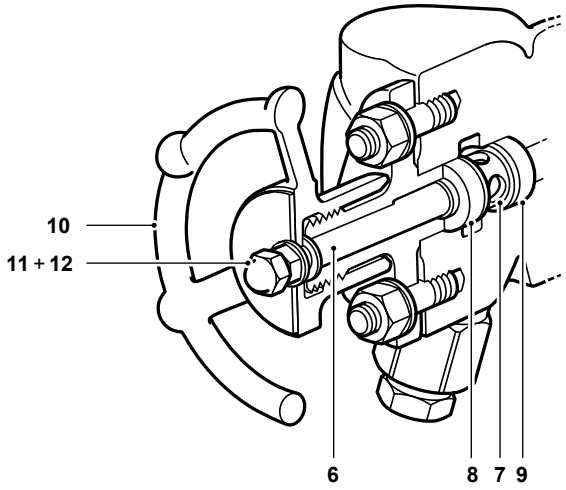
PC40 Materials

No.	Part	Material	
1	Pipeline connector body	Austenitic stainless steel	ASTM A182F : 304/304L
2	Bonnet	Carbon steel (Zinc plated)	ASTM A105N/LF2
3	Studs	Steel (plated)	ASTM A193 B7
4	Nuts	Steel (plated)	ASTM A194 2H
5	Washers	Stainless steel	
13	Name-plate	Stainless steel	

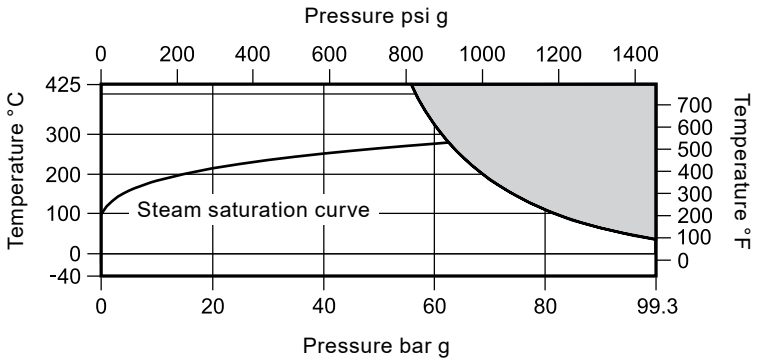


Valve internal materials

No.	Part	Material	
6	Piston	Stainless steel	AISI 410 : 1.4006
7	Lantern bush	Stainless steel	ASTM A276 : AISI 431
8	Upper ring	Graphite and stainless steel	
9	Lower ring	Graphite and stainless steel	
10	Handwheel	Carbon steel (Zinc plated)	EN 10213 : 1.0619N
11	Handwheel nuts	Stainless steel	
12	Nitronic 60 washers	Stainless steel	



Pressure/temperature limits (ISO 6552)



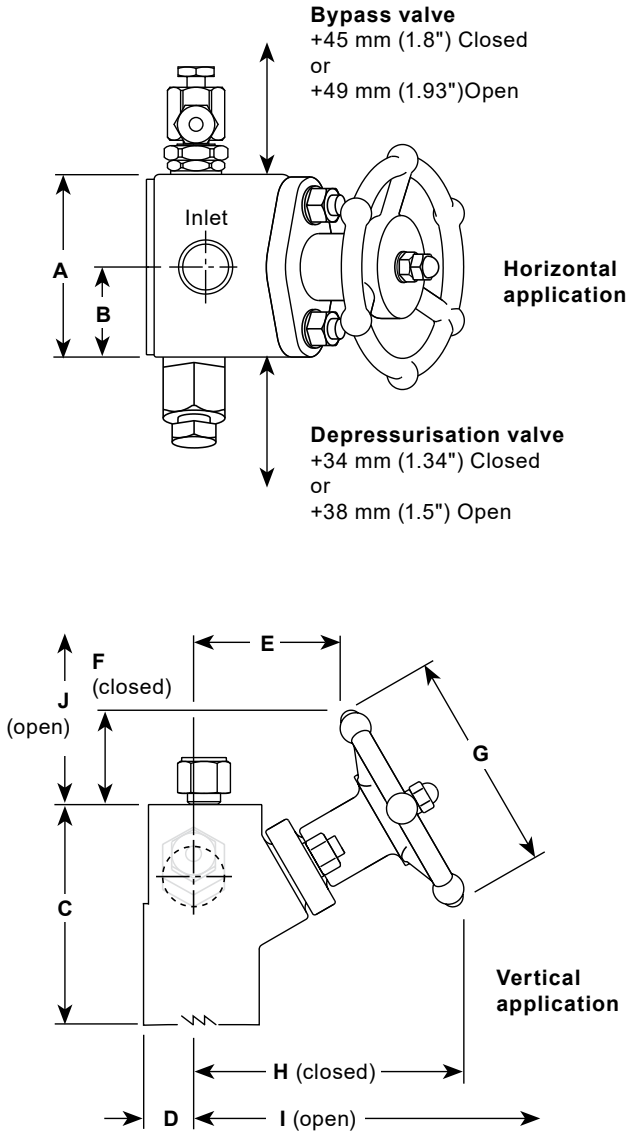
The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection - See notes below.

Body design condition		ASME 600
PMA Maximum allowable pressure	99.3 bar g @ 38 °C	1 440 psi g @ 100 °F
TMA Maximum allowable temperature	425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum allowable temperature	-46 °C	-51 °F
PMO Maximum operating pressure for saturated steam service	62 bar g @ 279 °C	899 psi g @ 534 °F
TMO Maximum operating temperature	425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum operating temperature	-46 °C	-51 °F
Designed for a maximum cold hydraulic test pressure of:	150 bar g	2 175 psi g

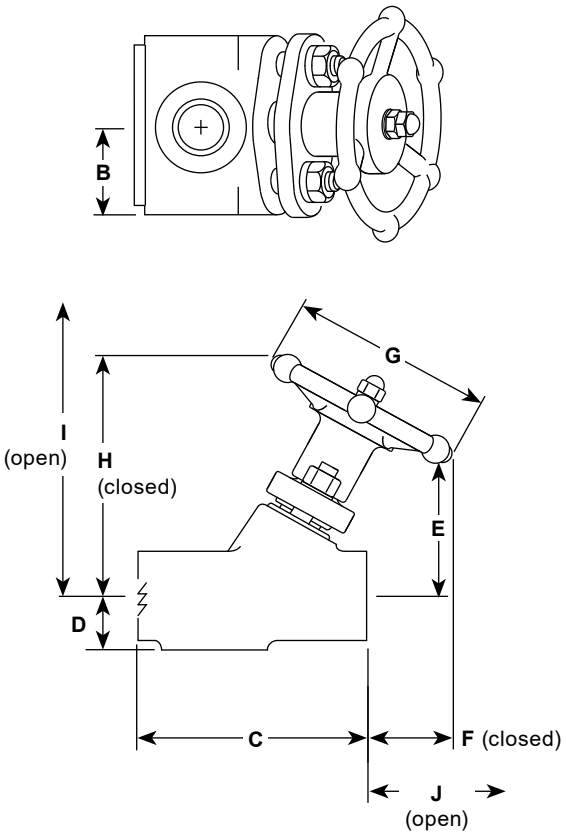
Notes:
1. If flange connections are fitted then these will limit the maximum and minimum design conditions of the pipeline connector.
2. The maximum operating limits of the complete assembly will be dictated by the steam trap of choice. Reference the specific steam trap technical information sheet for its 'Pressure/temperature limits'.

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

PC4001 and PC4000



PC40



Units	A	B	C	D	E	F	G	H	I	J	Weight
Metric	72	36	124	25	52	37	95	100	118	50	3.6 kgs
Imperial	2.8"	1.4"	4.9"	1"	2"	1.5"	3.7"	3.9"	4.64"	1.97"	7.9 lbs

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P128-35) supplied with the product.

General information

There are two criteria which must be satisfied to ensure that the swivel connector trap will operate correctly and ensure effective condensate removal:

1. The PC4001, PC4000 and PC40 shall be installed with flow in the direction of the arrow on connector body. Flow can be horizontal (left to right or right to left), vertical or inclined.
2. The connection face for the swivel connector steam trap must be in the vertical plane unless stated on relevant steam trap Installation and Maintenance Instructions.

After installation it is recommended that the pipeline connector is insulated to minimise radiated heat losses and to protect personnel from burns risk: Please note that some steam trap types should not be insulated.

Depressurisation and line drainage

The PC4001 and PC4000 assemblies are supplied fitted with valves which allow depressurisation of the system to enable safe removal and maintenance of the steam trap. The PC4001 is also supplied with bypass/line drainage fitted, however consideration must be given to the position of the discharge which should be directed or piped to a safe place where it will not injure personnel or damage equipment. PC40 only - Following isolation slightly loosen the trap bolts to ensure the full release of hot steam and condensate prior to commencing work. Safety equipment should be used and care taken to avoid potential injury.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in grey line are not supplied as spares. For ease of replacement an extractor tool is available for removing the sealing rings.

Available spares

Sealing ring set	**8** and **9**
Piston valve assembly	**2**, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11** and **12**
Piston valve sub-assembly	**6**, **7**, **8** and **9**
Extractor tool	Not shown
PC depressurisation valve and gasket	**14** and **20**
PC bypass valve assembly and gasket	**15, 16, 17, 18, 19, 20, 21, 22** and **23**
Strainer screen and gasket (pack of 3)	**20** and **24**
Valve gasket set (pack of 10)	**20**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state type and size of equipment.

Example: 1 off Sealing ring set for an integral piston valve on a PC4001 pipeline connector having DN15 socket weld connections.

Recommended tightening torques

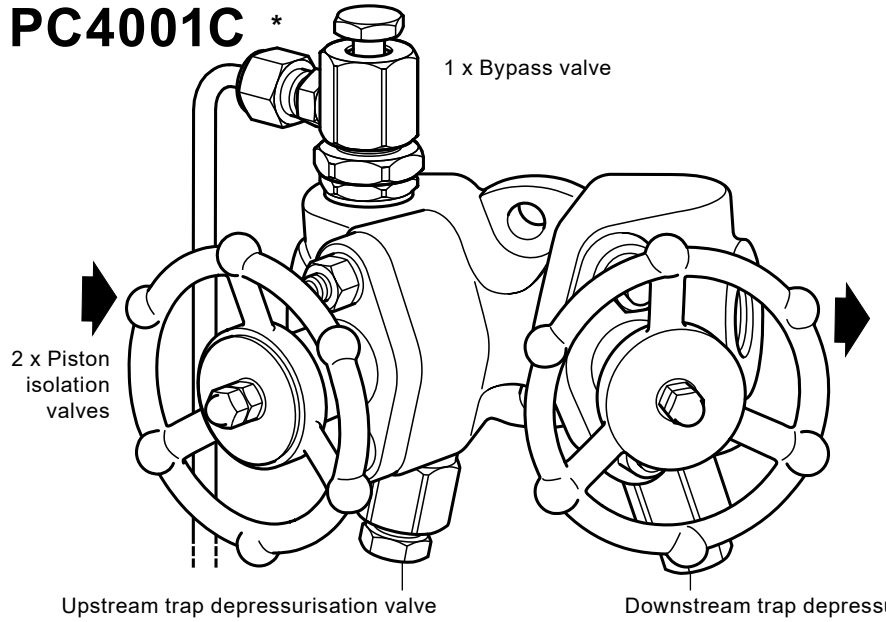
Item	 or mm 		N m	(Ft lb)
4	14	5/16" x 18 UNC	12.0	(9)
11	10	M6	12.0	(9)
14 and 23	24	M18	74 - 78	(55 - 58)
21	27	M14	45-50	(33 - 37)

PC4001 shown

TI-P128-42-IN
Issue 3

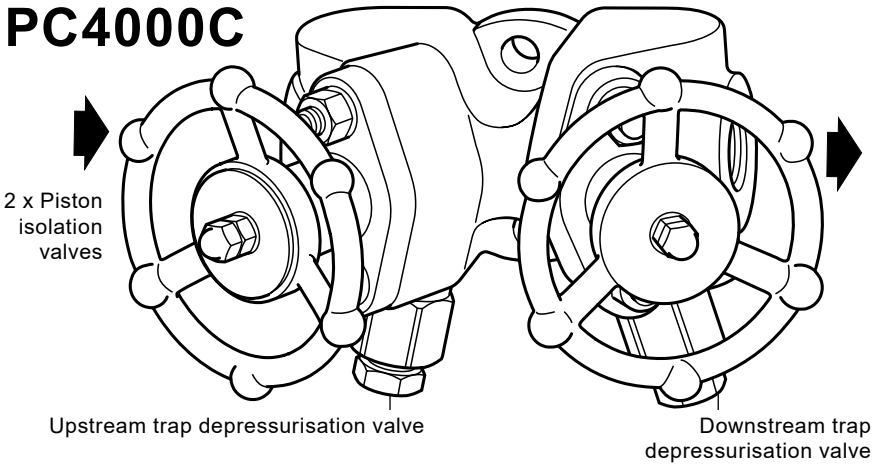
PC4001C, PC4000C and PC40C
Pipeline Connectors
For the Oil & Gas Industry

PC4001C *

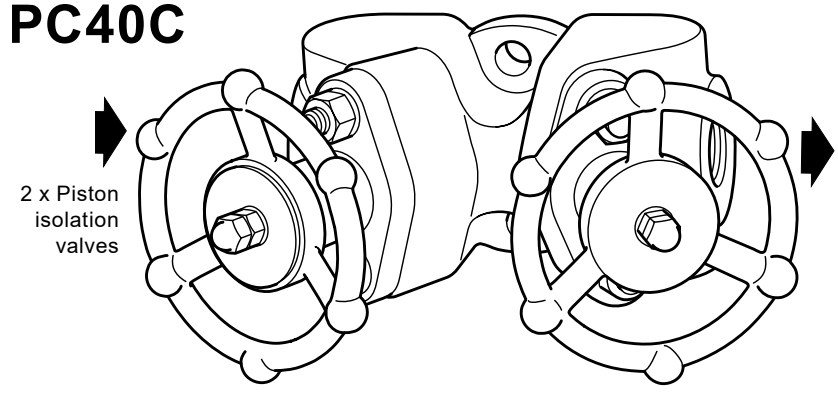


* **Please note** that the line drain outlet is shown out of position for clarity and that the line drain pipework is to be supplied by the customer.

PC4000C



PC40C



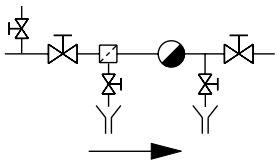
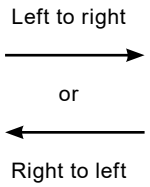
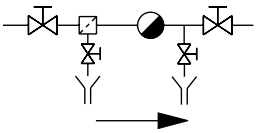
Description

The PC4001C, PC4000C and PC40C range of pipeline connectors are a complete 'Trap valve station solution' developed for use with two bolt universal swivel connector steam traps.
As the unit has been designed with two integral piston stop valves, it is possible to isolate both upstream and downstream of the universal trap connection.

PC4001C and PC4000C models only

Through the use of the fitted depressurisation valves it is possible to depressurise, test and drain the pipeline.
The trap depressurisation port also incorporates a maintainable 40 mesh stainless steel strainer screen to provide trap protection from system dirt and debris, which can be cleared through the use of the line pressure.

Available types

Model	Valve connections	P and ID diagram	Flow direction
PC4001C	2 x Piston isolation valves 1 x Upstream trap depressurisation valve 1 x Downstream trap depressurisation valve 1 x Bypass valve		
PC4000C	2 x Piston isolation valves 1 x Upstream trap depressurisation valve 1 x Downstream trap depressurisation valve		

For available options to the pipeline connections detailed within this Technical Information sheet please reference TI-F01-37.

Standards - These products fully comply with the requirements of the Indian Boiler Regulations, 1950.

Note: All certification / inspection requirements must be stated at the time of order placement. For other certification contact Spirax Sarco.

Sizes and pipe connections

DN15 and DN20 condensate inlet / outlet connections are available with screwed BSP or NPT and as a socket weld connection to ASME B16.11 class 3000. Drainage and venting connections have an M18 thread as standard.

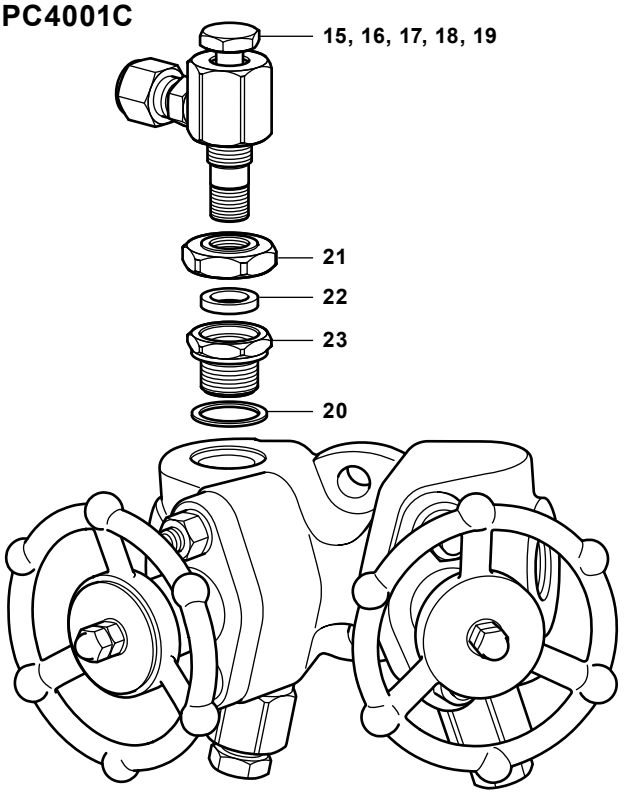
Flanged versions are also available upon request. Please contact Spirax Sarco for further details.

How to order

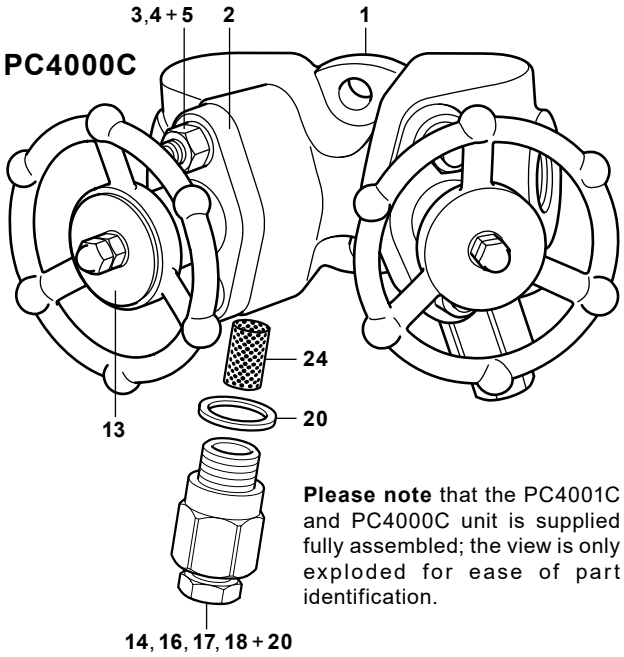
Example: 1 off ½" Spirax Sarco PC4001C pipeline connector having right to left flow and socket weld end connections to ASME B 16.11 Class 3000.

No.	Part	Material	
1	Pipeline connector body	Carbon steel	A105N / A350 LF2
2	Bonnet	Carbon steel (Zinc plated)	ASTM A105N / LF2
3	Studs	Steel (plated)	ASTM A193 B7
4	Nuts	Steel (plated)	ASTM A194 2H
5	Washers	Stainless steel	
6*	Piston	Stainless steel	AISI 410 : 1.4006
7*	Lantern bush	Stainless steel	ASTM A276 : AISI 431
8*	Upper ring	Graphite and stainless steel	
9*	Lower ring	Graphite and stainless steel	
10*	Handwheel	Carbon steel (Zinc plated)	EN 10213 : 1.0619N
11*	Handwheel nuts	Stainless steel	
12*	Nitronic 60 washers	Stainless steel	
13	Name-plate	Stainless steel	
14	Depressurisation valve	Stainless steel	ASTM A182 : 304 / 304L
15	Bypass valve	Stainless steel	ASTM A182 : 304 / 304L
16	Valve screw	Stainless steel	ASTM A276 : AISI 431
17	Valve cone	Stainless steel	AISI 440 B
18	Retaining ring	Stainless steel	BS 2056 302 S26
19	Compression fitting for the line drain valve only	Carbon steel (Zinc plated)	
20	Valve gasket	Graphite and stainless steel	
21	Bypass locknut	Stainless steel	ASTM A276 : AISI 431
22	Graphite ring	Die-formed graphite	
23	Bypass bottom body	Stainless steel	ASTM A182 304/304L
24	Strainer screen	Stainless steel	

PC4001C

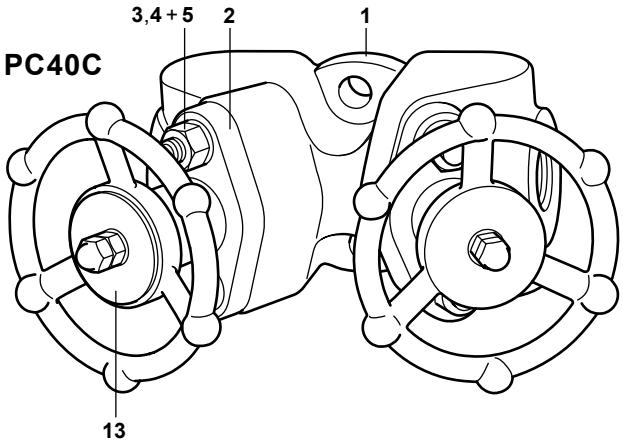


PC4000C



Please note that the PC4001C and PC4000C unit is supplied fully assembled; the view is only exploded for ease of part identification.

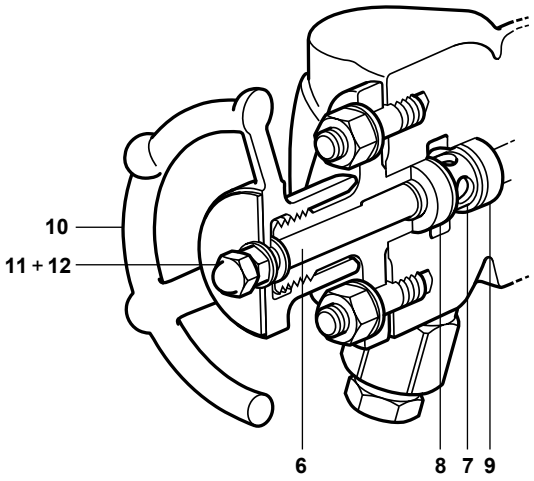
PC40C



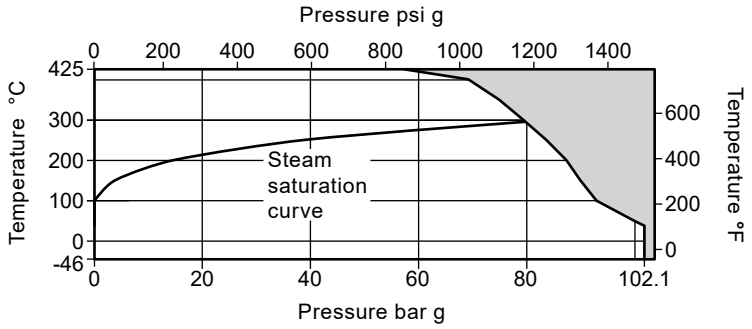
*** For valve internal materials, see next page**

Valve internal materials

No.	Part	Material	
6*	Piston	Stainless steel	AISI 410 : 1.4006
7*	Lantern bush	Stainless steel	ASTM A276 : AISI 431
8*	Upper ring	Graphite and stainless steel	
9*	Lower ring	Graphite and stainless steel	
10*	Handwheel	Carbon steel (Zinc plated)	EN 10213 : 1.0619N
11*	Handwheel nuts	Stainless steel	
12*	Nitronic 60 washers	Stainless steel	



Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection - See notes below.

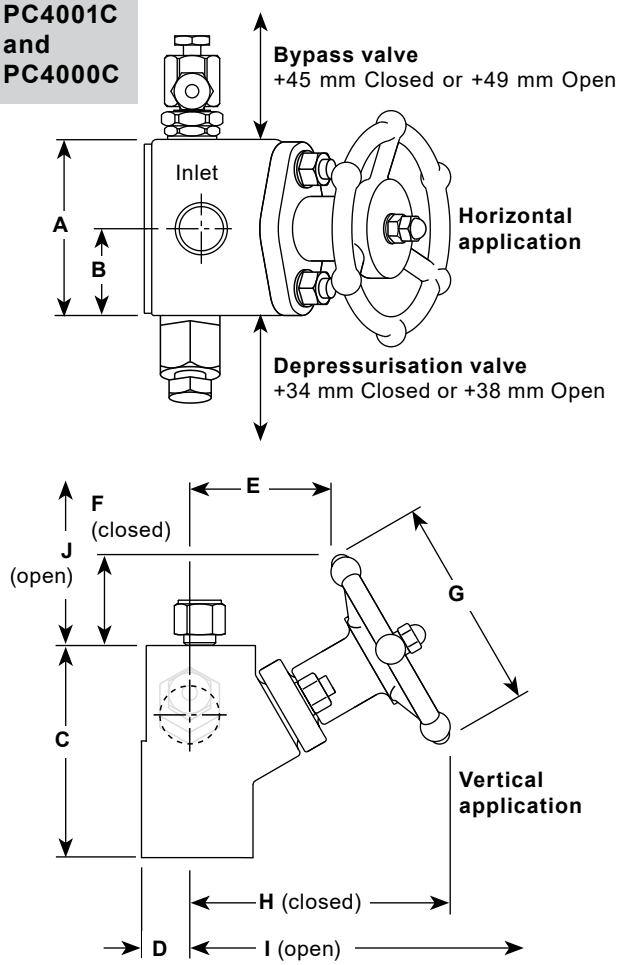
Body design condition			ASME 600
PMA	Maximum allowable pressure	102.1 bar g @ 38 °C	1 480 psi g @ 100 °F
TMA	Maximum allowable temperature	425 °C @ 57.5 bar g	797 °F @ 833 psi g
Minimum allowable temperature		-46 °C	-51 °F
PMO	Maximum operating pressure for saturated steam service	79.6 bar g @ 300 °C	1 154.5 psi g @ 572 °F
TMO	Maximum operating temperature	425 °C @ 57.5 bar g	797 °F @ 833 psi g
Minimum operating temperature		-46 °C	-51 °F
Designed for a maximum cold hydraulic test pressure of:		153.2 bar g	2 221.9 psi g

Notes:
1. If flange connections are fitted then these will limit the maximum and minimum design conditions of the pipeline connector.
2. The maximum operating limits of the complete assembly will be dictated by the steam trap of choice. Reference the specific steam trap technical information sheet for its 'Pressure / temperature limits'.

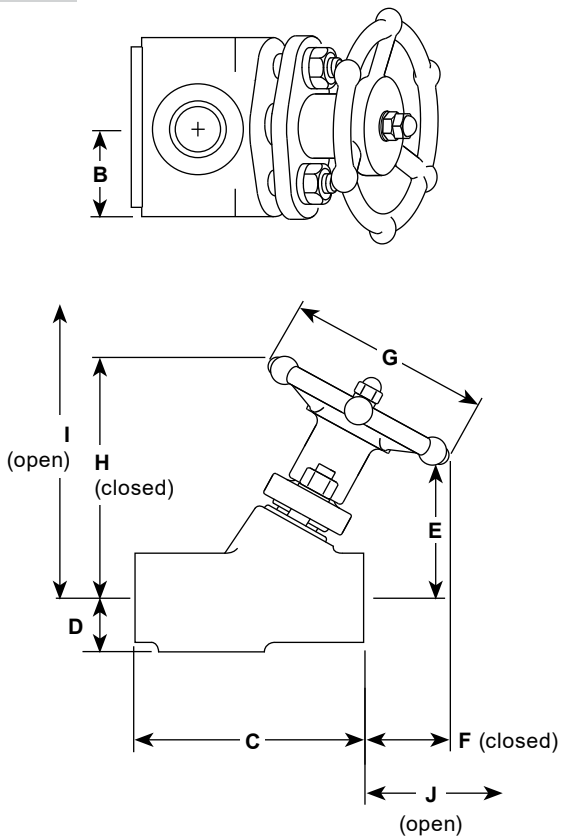
Dimensions/weight (approximate in mm (inches) and kg (lbs))

Units		A	B	C	D	E	F	G	H	I	J	Weight
Metric	mm	72	36	124	25	52	37	95	100	118	50	3.6 kgs
Imperial	inches	2.8"	1.4"	4.9"	1"	2"	1.4"	3.7"	3.9"	4.64"	1.97"	7.9 lbs

PC4001C and PC4000C



PC40C



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-IBR128-40) supplied with the product.

General information

There are two criteria which must be satisfied to ensure that the swivel connector trap will operate correctly and ensure effective condensate removal:

1. The PC4001C, PC4000C and PC40C shall be installed with flow in the direction of the arrow on the connector body. Flow can be horizontal (left to right or right to left), vertical or inclined.
2. The connection face for the swivel connector steam trap must be in the vertical plane unless stated on relevant steam trap Installation and Maintenance Instructions.

After installation it is recommended that the pipeline connector is insulated to minimise radiated heat losses and to protect personnel from burns risk: Please note that some steam trap types should not be insulated.

Depressurisation and line drainage

The PC4001C and PC4000C assemblies are supplied fitted with valves which allow depressurisation of the system to enable safe removal and maintenance of the steam trap. The PC4001C is also supplied with bypass fitted, however consideration must be given to the position of the discharge which should be directed or piped to a safe place where it will not injure personnel or damage equipment.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares. For ease of replacement an extractor tool is available for removing the sealing rings.

Available spares

Sealing ring set	**8** and **9**
Piston valve assembly	**2**, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11** and **12**
Piston valve sub-assembly	**6**, **7**, **8** and **9**
Extractor tool	Not shown
PC depressurisation valve and gasket	**14** and **20**
PC bypass valve assembly and gasket	**15, 16, 17, 18,19, 21, 22, 23** and **20**
Strainer screen and gasket (pack of 3)	**24** and **20**
Valve gasket set (pack of 10)	**20**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state type and size of equipment.

Example: 1 off Sealing ring set for an integral piston valve on a PC4001C pipeline connector having DN15 socket weld connections.

Recommended tightening torques

Item	 or mm 		N m
4	14	5/16" x 18 UNC	12.0
11	10	M6	12.0
14 and 23	24	M18	74 - 78
21	27	M14	45-50

PC4001C shown

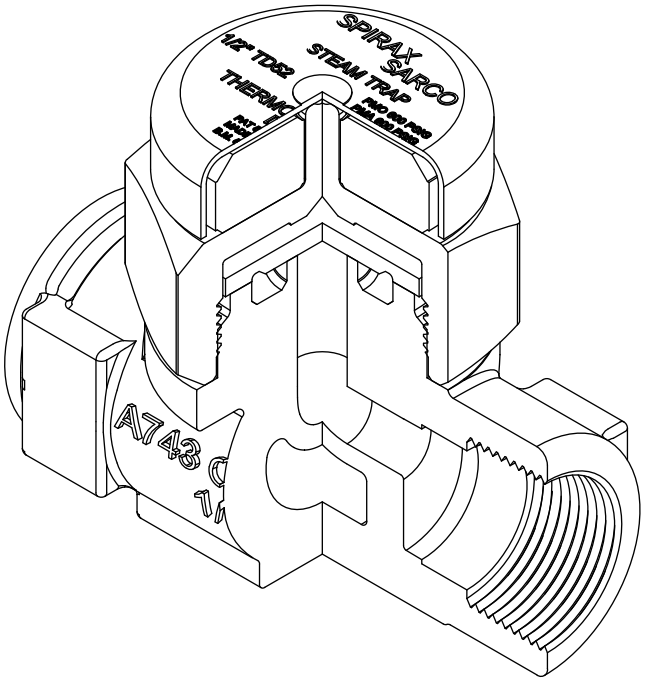
TI-P014-23-US
Issue 1

Thermodynamic Steam Trap
TD52

Description

The Thermodynamic steam trap cycles periodically to discharge condensate very near to steam temperature.
It is unaffected by waterhammer or superheat.

Model	TD52
PMO	600 psi g (41 bar g)
Sizes	⅜", ½", ¾", 1"
Connections	NPT
Construction	Stainless steel



Limiting operating conditions

Maximum operating pressure (PMO)	600 psi g (42 bar g)
Maximum operating temperature	800 °F (427 °C) at all operating pressures
Minimum pressure for satisfactory operation is	3.5 psi g, (0.24 bar g).

Maximum back pressure should not exceed 80% of the inlet pressure under any conditions of operation, otherwise the trap may not shut.

Pressure shell design conditions

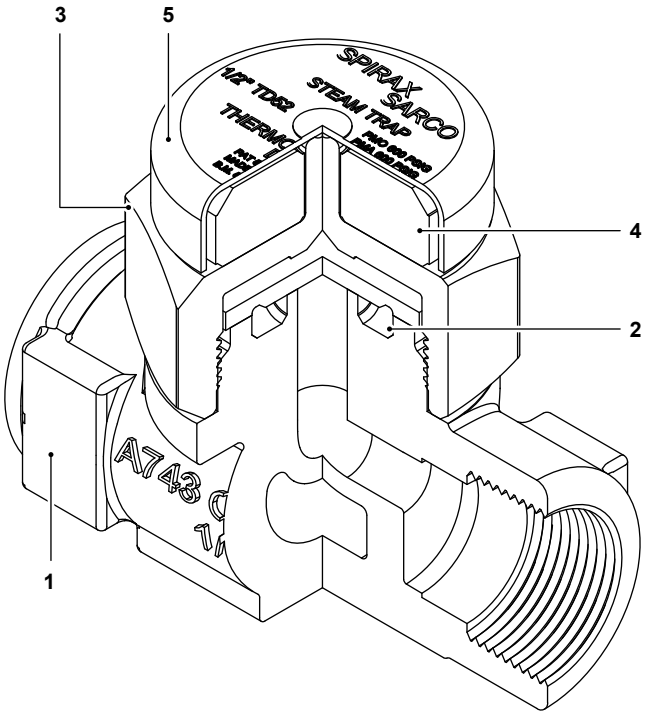
PMA	Maximum allowable pressure	600 psi g @ up to 800 °F	42 bar g @ up to 427 °C
TMA	Maximum allowable temperature	800 °F @ 0-600 psi g	427 °C @ 0-42 bar g

Typical applications

Steam main drainage and tracer lines, process equipment, laundry and kitchen equipment, superheated steam applications, outdoor installations subject to freezing.

Materials

No.	Part	Material	
1	Body	Stainless Steel (with ENP)	ASTM A743 GR. CA40
2	Disc	Stainless Steel	AISI 420
3	Cap	Stainless Steel (with ENP)	ASTM A743 GR. CA40
4	Insulator	Ceramic	
5	Nameplate cover	Stainless Steel	Type 304

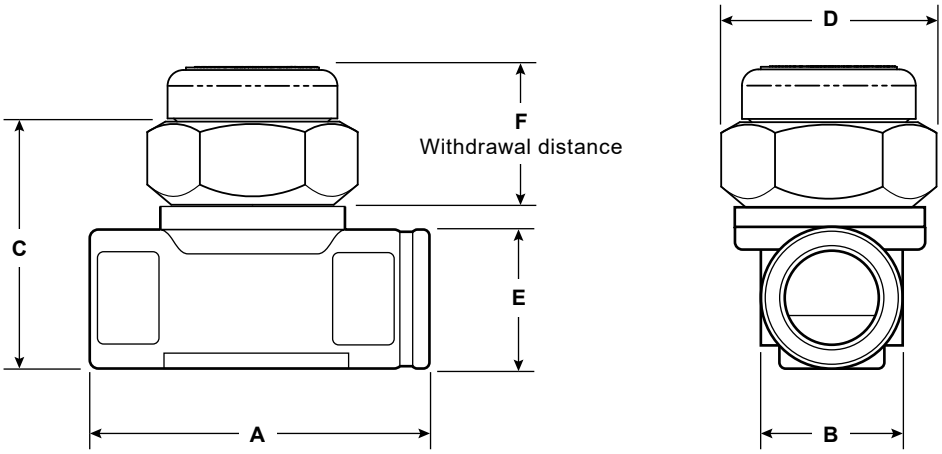


Capacities

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

Inlet pressure psi g	Inlet pressure bar g	⅜" TD52 ½" TD52L	½" TD52 ¾" TD52L	¾" TD52	1" TD52
3.5	0.24	180	300	405	640
5	0.34	185	310	420	670
10	0.69	190	345	470	725
20	1.4	200	410	560	865
30	2.1	215	465	640	980
50	3.4	245	575	810	1200
75	5.2	305	700	1000	1470
100	6.9	370	810	1160	1750
150	10.3	500	1000	1450	2200
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

Dimensions/weights (approximate) in inches (mm) and pounds (kg)

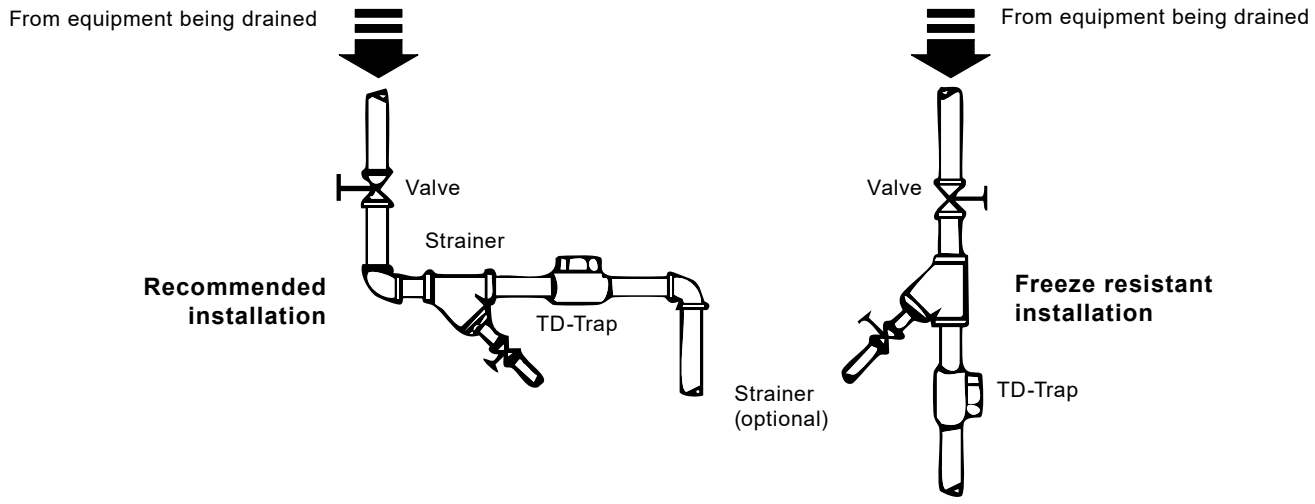


Type	A	B	C	D	E	F	Weight
⅜" TD52	2 (50.8)	1.03 (26.2)	2.2 (55.9)	1.7 (43.2)	1 (25.4)	0.4 (10.2)	0.84 (0.38)
½" TD52L	2.7 (68.6)	1.24 (31.5)	2.5 (63.5)		1.2 (30.4)		1.2 (0.54)
½" TD52				1.8 (45.7)			
¾" TD52L	2.8 (71.1)	1.56 (39.6)	2.8 (71.1)		1.5 (38.1)		1.94 (0.88)
¾" TD52			2.9 (73.7)	2.1 (53.3)			
1" TD52	3.3 (83.8)	1.91 (46)	3.4 (86.4)	2.5 (63.5)	1.8 (45.7)	0.6 (15.2)	3.13 (1.42)

Installation

The preferred installation is in the horizontal position as close as possible to equipment being drained. Install strainer (20 mesh) upstream and full port isolating valves upstream and downstream of trap. Piping to and from the trap should be at least equal to or one size larger than trap connection. Do not weld pipe connection to trap. Body material is not suitable for welding.

For freeze resistant installations, all drains must be pitched toward the trap for gravity flow. Trap must be installed vertically, discharging downward. Discharge piping must be self-draining.



Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation of the trap from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the disc and seat.
The only wearing parts of the trap are the disc and seat rings, which should be inspected and cleaned periodically. Slight wear can often be corrected by resurfacing on a lapping plate.

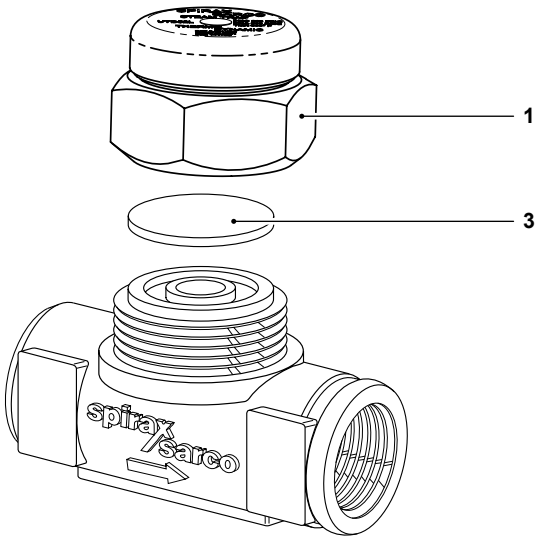
Caution: Only perform maintenance after trap has been isolated.

Complete installation and maintenance instructions are given in IM-2-516-US, which accompanies the product.

Sample specification

Steam trap shall be all stainless steel Thermodynamic disc type with connections on a common center line, which will operate in any position. Integral seat design with hardened disc and seating surfaces. Trap to have integral insulating cap.

Spare parts



Disc	**3**
Cap Assembly	**1**

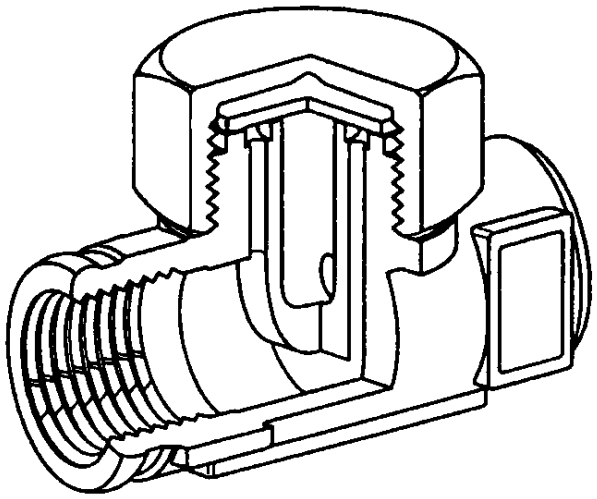
TI-P019-06-US
Issue 1

Thermodynamic Steam Trap
TDC

Description

The Thermodynamic steam trap cycles periodically to discharge condensate very near to steam temperature. It is unaffected by waterhammer or superheat.

Model	TDC
PMO	600 psi g (41 bar g)
Sizes	⅜", ½", ¾" and 1" (DN10, DN15, DN20, and DN25)
Connections	NPT
Construction	Stainless steel



Typical applications

Steam main drainage and tracer lines, process equipment, laundry and kitchen equipment, superheated steam applications, outdoor installations subject to freezing.

Limiting operating conditions

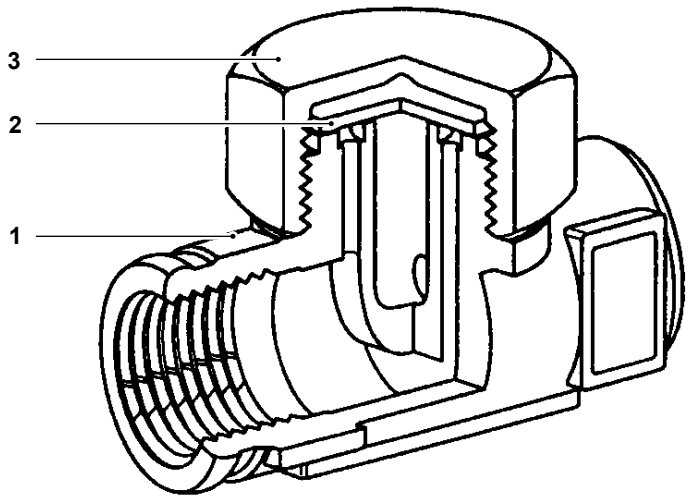
PMO Maximum Operating Pressure	600 psi g	(41 bar g)
Maximum Operating Temperature (at all operating pressures)	800 °F	(427 °C)
Minimum pressure for satisfactory operation is	3.5 psi g	(0.24 bar g)

Maximum back pressure should not exceed 80% of the inlet pressure under any conditions of operation, otherwise the trap may not shut.

Pressure shell design conditions

PMA	Maximum allowable pressure	600 psi g/up to 800 °F	(41 bar g/up to 427 °C)
TMA	Max. allowable temperature	800 °F/0-600 psi g	(427˚C/0-41 bar g)

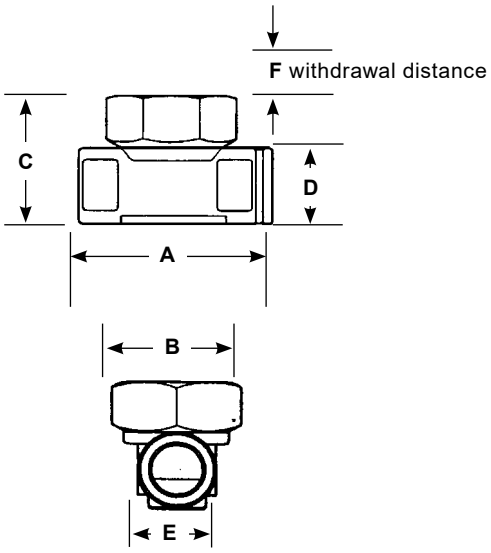
Materials



No.	Part	Material	
1	Body	Stainless steel	ASTM A743 GR. CA40
2	Cap	Stainless steel	ASTM A743 GR. CA40
3	Disc	Stainless steel	AISI 420

Dimensions/weights

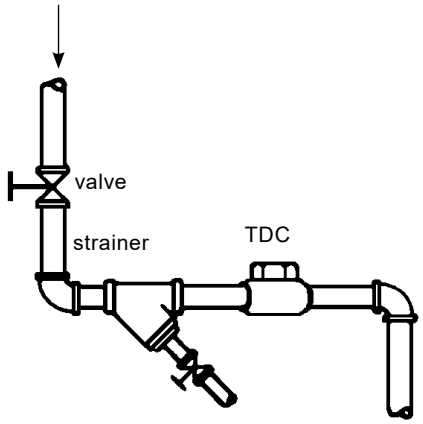
(approximate) in inches (mm) and lbs (kg)



Size	A	B	C	D	E	F	Weight
⅜" TDC	2	1.7	1.7	1	1.03	0.4	.7 lb
	(50.8)	(43.2)	(43.2)	(25.4)	(26.2)	(10.2)	(.32 kg)
½" TDC	2.7	1.7	2	1.2	1.24	0.4	0.9 lb
	(68.6)	(43.2)	(50.8)	(30.5)	(31.5)	(10.2)	(.41 kg)
¾" TDC	2.8	2.1	2.4	1.5	1.56	0.4	1.8 lb
	(71.1)	(53.3)	(61.0)	(38.1)	(39.6)	(10.2)	(.82 kg)
1" TDC	3.3	2.5	2.8	1.8	1.87	0.6	2.7 lb
	(83.8)	(63.5)	(71.1)	(45.7)	(47.5)	(15.2)	(1.22 kg)

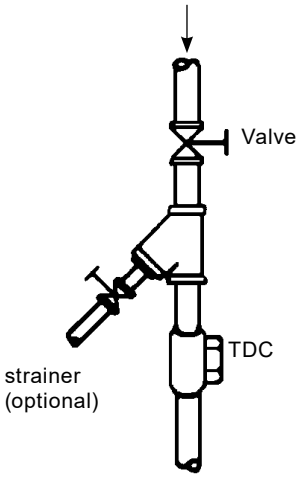
Recommended installation

From equipment being drained



Freeze resistant installation

From equipment being drained



Capacities

Pounds of condensate per hour (kg/hr) continuous discharge at saturated steam temperature to atmosphere

Inlet pressure		TDC	TDC	TDC	TDC
psi g	bar g	⅜" (DN10)	½" (DN15)	¾" (DN20)	1" (DN25)
3.5	.24	180 (82)	300 (136)	405 (184)	640 (290)
5	.34	185 (84)	310 (141)	420 (191)	670 (304)
10	.69	190 (86)	345 (156)	470 (213)	725 (329)
20	1.4	200 (91)	410 (186)	560 (254)	865 (392)
30	2.1	215 (98)	465 (211)	640 (290)	980 (445)
50	3.4	245 (111)	575 (261)	810 (367)	1200 (544)
75	5.2	305 (138)	700 (317)	1000 (454)	1470 (667)
100	6.9	370 (168)	810 (367)	1160 (526)	1750 (794)
150	10.3	500 (227)	1000 (454)	1450 (658)	2200 (998)
200	13.8	610 (277)	1140 (517)	1670 (757)	2600 (1179)
250	17.2	700 (318)	1270 (576)	1900 (862)	2900 (1315)
300	20.7	790 (358)	1410 (640)	2100 (953)	3250 (1474)
350	24.1	880 (399)	1530 (694)	2250 (1021)	3500 (1588)
400	27.6	960 (435)	1630 (739)	2430 (1102)	3780 (1715)
450	31.0	1050 (476)	1730 (785)	2600 (1179)	4020 (1823)
500	34.5	1100 (499)	1830 (830)	2750 (1247)	4250 (1928)
550	37.9	1160 (526)	1910 (866)	2900 (1315)	4450 (2018)
600	41.4	1250 (567)	2000 (907)	3050 (1383)	4700 (2132)

Sample specification

Steam trap shall be all stainless steel Thermodynamic disc type with connections on a common center line, which will operate in any position. Integral seat design with hardened disc and seating surfaces. Trap to have three hole balanced discharge.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation of the trap from both supply and return line is required before any servicing is performed.

The trap should be disassembled periodically for inspection and cleaning of the disc and seat.

The only wearing parts of the trap are the disc and seat rings, which should be inspected and cleaned periodically. Slight wear can often be corrected by resurfacing on a lapping plate.

Caution

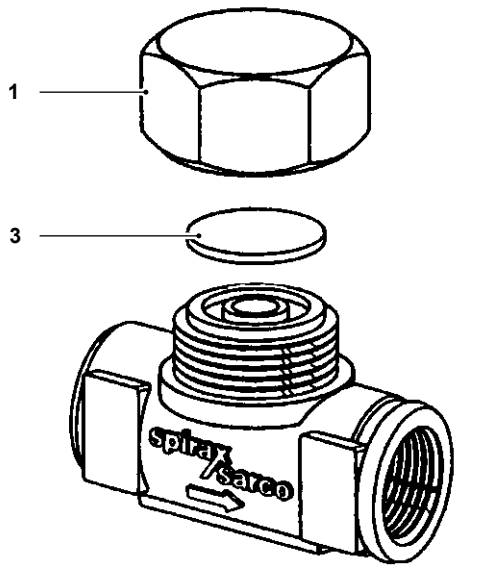
Only perform maintenance after trap has been isolated.

Complete installation and maintenance instructions are given in IMI 2.5162, which accompanies the product.

Installation

The preferred installation is in the horizontal position as close as possible to equipment being drained. Install strainer (20 mesh) upstream and full port isolating valves upstream and downstream of trap. Piping to and from the trap should be at least equal to or one size larger than trap connection. Do not weld pipe connection to trap. Body material is not suitable for welding.
For freeze resistant installations, all drains must be pitched toward the trap for gravity flow. Trap must be installed vertically, discharging downward. Discharge piping must be self-draining.

Spare parts



Disc	**3**
Cap	**1**

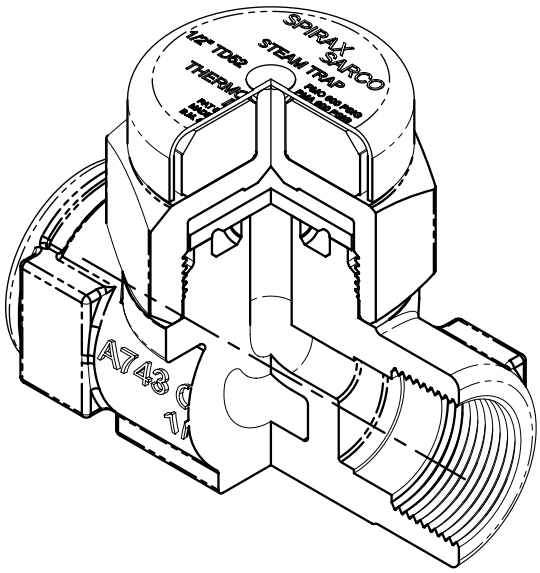
TI-P019-07-US
Issue 1

Thermodynamic Steam Trap
TDT Tracer Trap

Description

The Thermodynamic steam trap cycles periodically to discharge condensate at a subcooled temperature.

It is unaffected by waterhammer or superheat. specifically designed as a tracing trap.



Model	TDT
PMO	150 psi g (10.3 bar g)
Sizes	½"
Connections	NPT
Construction	Stainless steel

Typical applications

Tracer lines and application where subcooling condensate is desired.

Limiting operating conditions

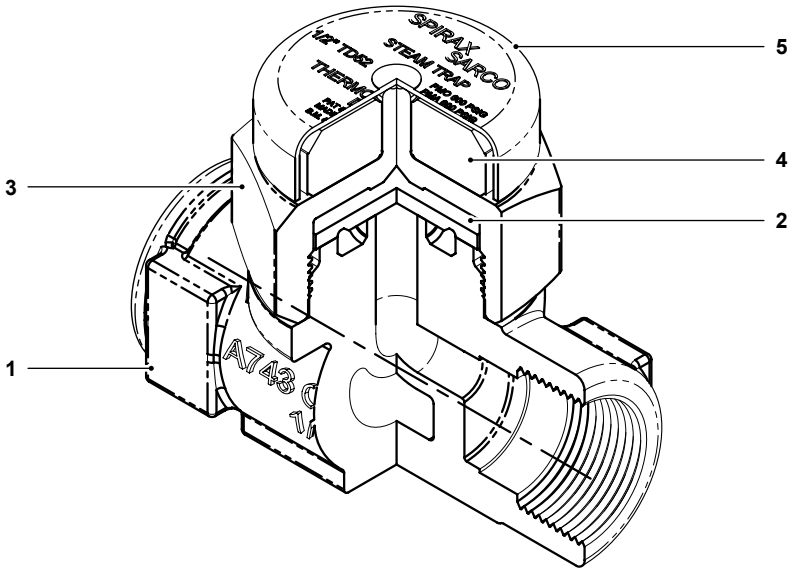
PMO	Maximum operating pressure	150 psi g	(10 bar g)
Maximum operating temperature (at all operating pressures)		800 °F	(427 °C)
Minimum pressure for satisfactory operation is		5 psi g	(0.34 bar g).

Maximum back pressure should not exceed 80% of the inlet pressure under any conditions of operation, otherwise the trap may not shut.

Pressure shell design conditions

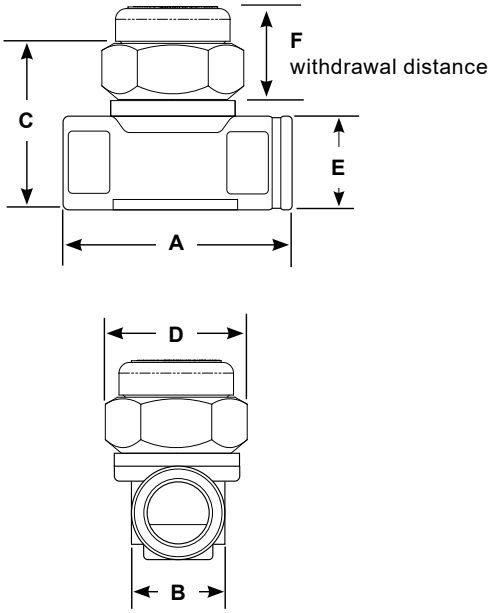
PMA	Maximum allowable pressure	600 psi g/up to 800 °F	(41 bar g/up to 427 °C)
TMA	Maximum allowable temperature	800 °F/0-600 psi g	(427 °C/0-41 bar g)

Materials



No.	Part	Material	
1	Body	Stainless steel (with ENP)	ASTM A743 GR. CA40
2	Disc	Stainless steel	AISI 420
3	Cap	Stainless steel (with ENP)	ASTM A743 GR. CA40
4	Insulator	Ceramic	
5	Nameplate Cover	Stainless steel	Type 304

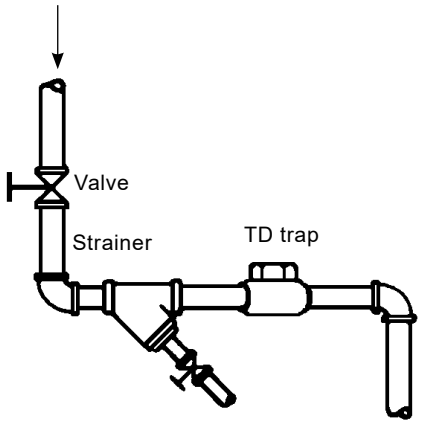
Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Type	A	B	C	D	E	F	Weight
½" TD52L	2.7 (68.6)	1.24 (31.5)	2.5 (63.5)	1.7 (43.2)	1.2 (30.5)	.4 (10.2)	1.2 lbs (.54 kg)

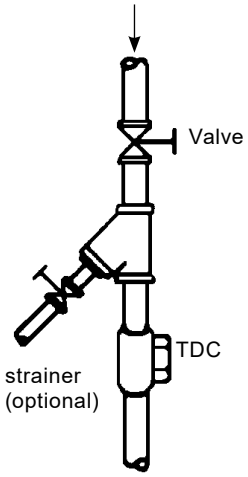
Recommended installation

From equipment being drained



Freeze resistant installation

From equipment being drained



Capacities

Pressure psi g	Pressure bar g	Cold Water lb/hr. (kg/hr)	Hot condensate lb/hr. (kg/hr)
10	0.69	440 (200)	75 (34)
20	1.4	550 (249)	100 (45)
30	2.1	630 (286)	100 (45)
50	3.4	830 (376)	100 (45)
75	5.2	1000 (454)	100 (45)
100	6.9	1190 (540)	100 (45)
125	8.6	1340 (608)	100 (45)
150	10.3	1445 (655)	100 (45)

Condensate flow	Average operating subcool below saturation
< 50 lb/hr (23 kg/hr)	34 °F (1 °C)
< 100 lb/hr. (45 kg/hr)	50 °F (10 °C)

Typical tracer output for 100ft @ 40 °F (30.5 m @ 4 °C) product temperature

Pressure psi g (bar g)	⅜" nom. .50 OD	½"nom. .625 OD	¾" nom. .875 OD	1" nom. 1.125 OD
15 (1)	15	18	25	33
25 (1.7)	16	20	28	36
50 (3.4)	19	23	32	42
100 (6.9)	22	28	39	50
150 (10)	25	31	44	56

Sample specification

Steam trap shall be all stainless steel Thermodynamic disc type with connections on a common center line, which will operate in any position. Integral seat design with hardened disc and seating surfaces. Trap to have integral insulating cap.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation of the trap from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the disc and seat.
The only wearing parts of the trap are the disc and seat rings, which should be inspected and cleaned periodically. Slight wear can often be corrected by resurfacing on a lapping plate.

Caution

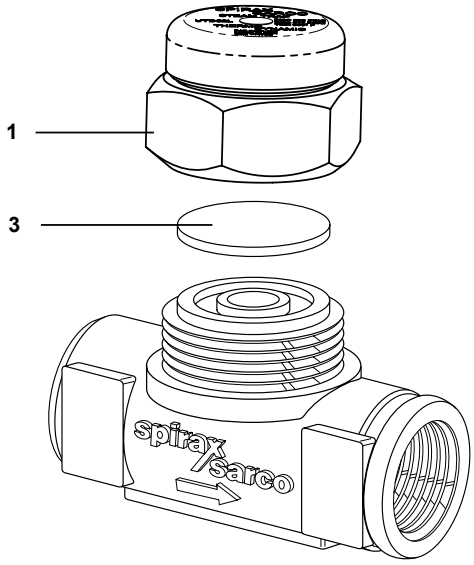
Only perform maintenance after trap has been isolated.

Complete installation and maintenance instructions are given in IMI 2.516, which accompanies the product.

Installation

The preferred installation is in the horizontal position as close as possible to equipment being drained. Install strainer (20 mesh) upstream and full port isolating valves upstream and downstream of trap. Piping to and from the trap should be at least equal to or one size larger than trap connection. Do not weld pipe connection to trap. Body material is not suitable for welding.
For freeze resistant installations, all drains must be pitched toward the trap for gravity flow. Trap must be installed vertically, discharging downward. Discharge piping must be self-draining.

Spare parts



Disc	**3**
Cap Assembly	**1**

TI-S01-03
CMGT Issue 13

TD42L and TD42H
Thermodynamic Steam Traps

Description

The TD42L and TD42H are maintainable thermodynamic steam traps. The TD42L is specifically designed for relatively small condensate loads and therefore is ideal for mains drainage applications. For process type loads the TD42H is available.
For those applications where the release of air is a concern, an anti-air-binding disc is available i.e. TD42LA and TD42HA.
All external body surfaces have an electroless nickel preparation (ENP) which is both energy saving and oxidation resistant.

Standards

These products fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

This product is available with a manufactures' Typical Test Report.
Note: All certification/inspection requirements must be stated at time of order placement.

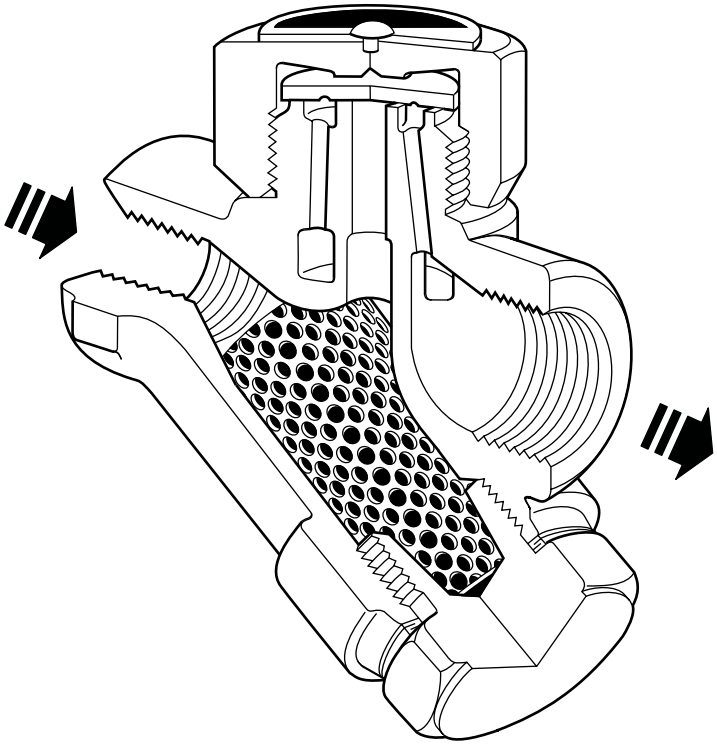
Sizes and pipe connections

TD42L	⅜", ½", ¾" and 1"	screwed BSP T Rp (ISO 7-1) or NPT
TD42H	½", ¾" and 1"	screwed BSP T Rp (ISO 7-1) or NPT
TD42LA	⅜", ½", ¾" and 1"	screwed BSP T Rp (ISO 7-1) or NPT
TD42HA	½" and ¾"	screwed BSP T Rp (ISO 7-1) or NPT

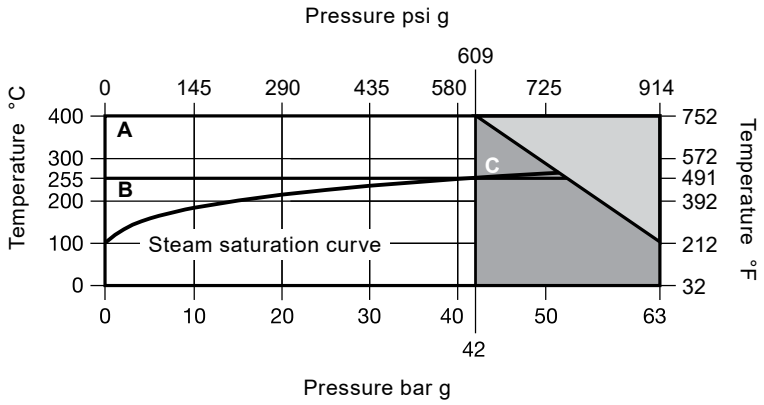
Optional extras

Insulating cover: to prevent the trap being unduly influenced by excessive heat loss such as when subjected to low outside temperatures, wind, rain etc.

Integral blowdown valve: a BDV1 or BDV2 can be fitted to the strainer cap, alternatively the strainer cap can be drilled, tapped and plugged ⅜" BSP T Rp (ISO 7-1) or NPT.



Pressure/temperature limits (ISO 6552)



2.2
14

The product **must not** be used in this region.

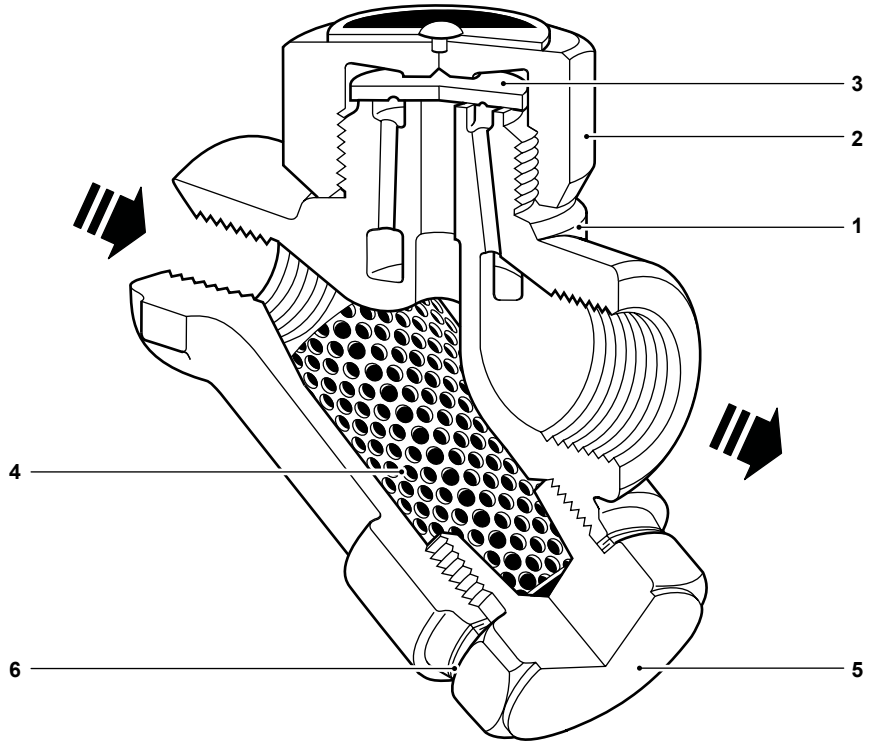
For optimum product performance the PMO should not exceed 42 bar g (609 psi g).

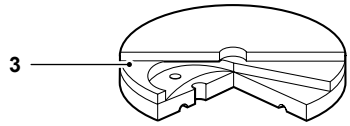
A - B TD42L and TD42H

B - C TD42LA and TD42HA

Body design conditions				PN63
PMA	Maximum allowable pressure		63 bar g @ 100 °C	914 psi g @ 212 °F
TMA	Maximum allowable temperature		400 °C @ 42 bar g	752 °F @ 609 psi g
Minimum allowable temperature			0 °C	32 °F
PMO	Maximum operating pressure		42 bar g	609 psi g
TMO	Maximum operating temperature	TD42L and TD42H	400 °C @ 42 bar g	752 °F @ 609 psi g
		TD42LA and TD42HA	255 °C @ 42 bar g	491 °F @ 609 psi g
Minimum operating temperature			0 °C	32 °F
Minimum inlet pressure for satisfactory operation		TD42L and TD42H	0.25 bar g	3.63 psi g
		TD42LA and TD42HA	0.80 bar g	11.6 psi g
PMOB	Maximum operating backpressure should not exceed 80% of the upstream pressure			
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of			95 bar g	1378 psi g

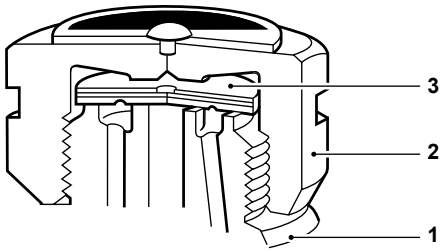
Materials





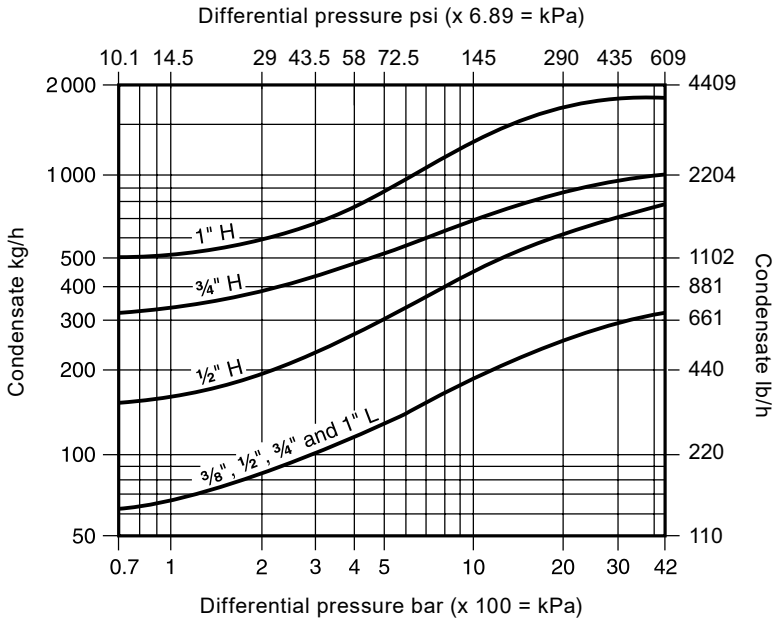
TD42LA and TD42HA Anti-air-binding disc

Groove indentifies LA and HA versions

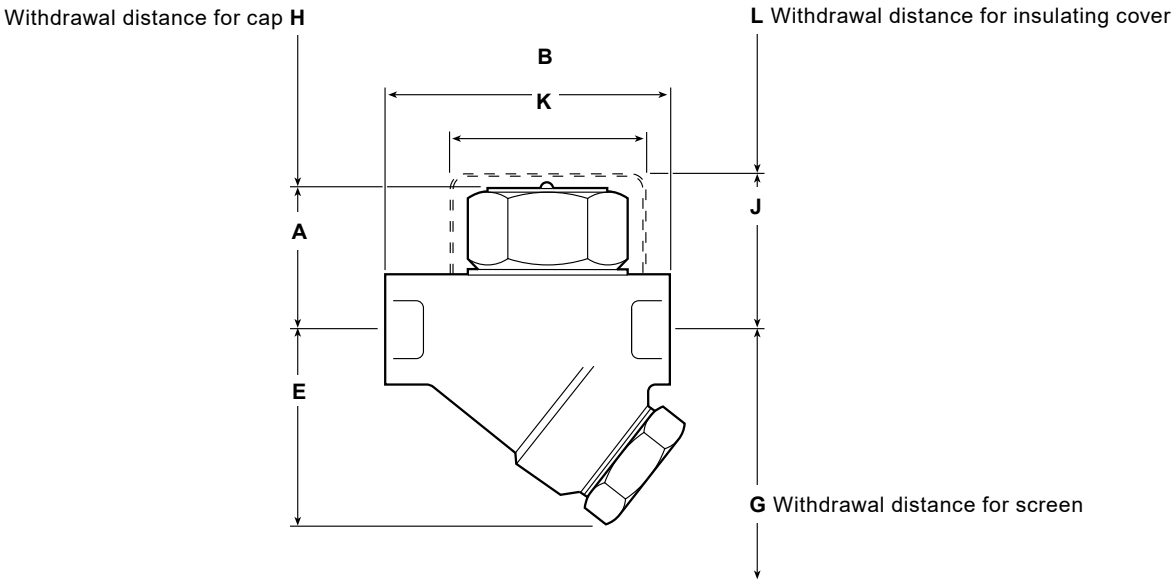


No.	Part	Material	
1	Body	Stainless steel (with ENP finish)	ASTM A743 Gr. CA 40 F
2	Cap	Stainless steel	AISI 416
3	Disc	Stainless steel	BS 1449 420 S45
4	Strainer screen	Stainless steel	ASTM A240 316L
5	Strainer cap	Stainless steel	AISI 416
6	Strainer cap gasket	Stainless steel	BS 1449 304 S16
7	Insulating cover (optional extra)	Aluminium	

Capacities



Dimensions/weights (approximate) in mm (inches)and kg (lbs)



Size		A		B		E		G		H		J		K		L		Weight	
		mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	kg	lbs
⅜"	L	41	1.61	78	3.07	55	2.17	85	3.35	20	0.79	52	2.05	57	2.24	38	1.50	0.80	1.76
½"	L																	0.75	1.65
¾"	L	44	1.73	85	3.35	60	2.36	100	3.94									0.95	2.09
1"	L	48	1.90	95	3.74	65	2.56					58	2.28					1.50	3.31
½"	H	41	1.61	78	3.07	55	2.17	85	3.35	41	1.61	57	2.24					0.80	1.76
¾"	H	47	1.85	90	3.54	60	2.36	100	3.94			63	2.48					1.00	2.20
1"	H	53	2.09	96	3.78	66	2.60					-		-		-		1.50	3.31

Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-P068-24) supplied with the product.

Installation note
The TD42L or TD42H should be installed in the horizontal plane, with a small drop leg preceeding it.

Disposal
This product is recycable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

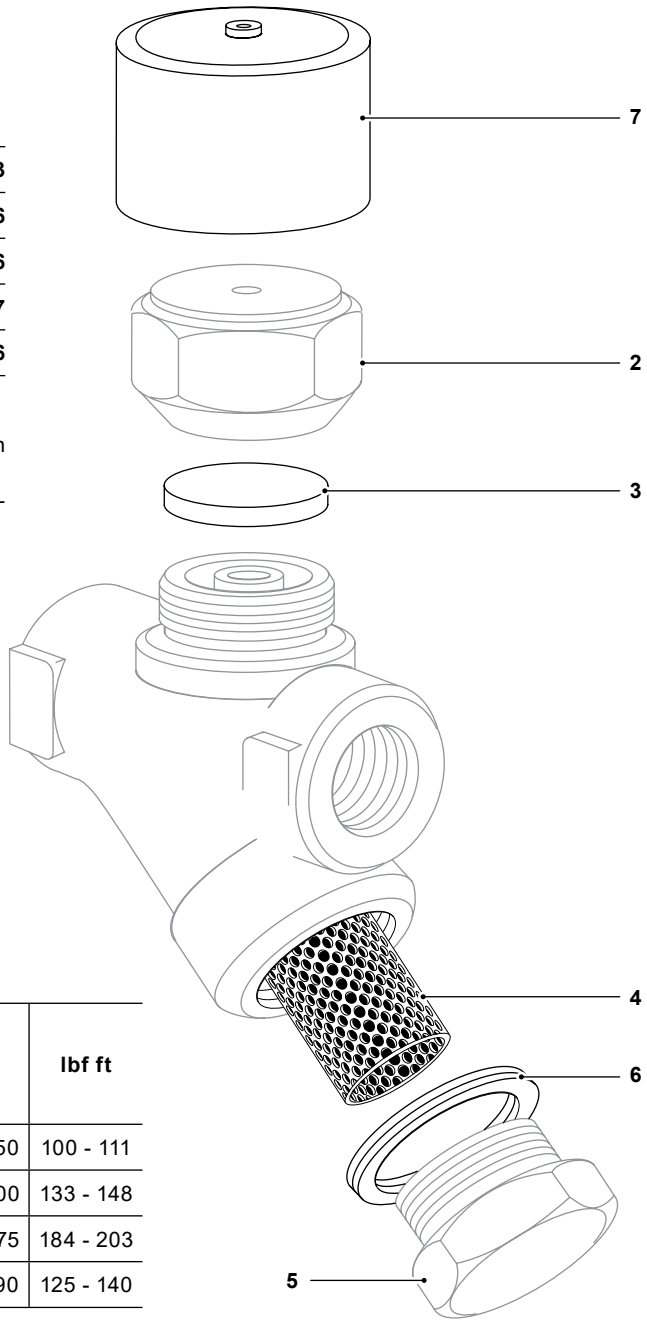
How to order
Example: 1 off Spirax Sarco ½" TD42L thermodynamic steam trap having screwed BSP T Rp (ISO 7-1) connections.

Spare parts
The spare parts available are shown in solid outline.
Parts drawn in a grey line are not supplied as spares.

Available spares

Disc (packet of 3)	(TD42L or TD42H)	**3**
Disc and strainer screen	(TD42LA or TD42HA)	**3, 4, 6**
Strainer screen and gasket	(TD42L or TD42H)	**4, 6**
Insulating cover		**7**
Strainer cap gasket (packet of 3)		**6**

How to order spares
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.
Example: 1 - Strainer screen and gasket for a Spirax Sarco ½" TD42L thermodynamic steam trap.



Recommended tightening torques

Item	Part	or mm	N m	lbf ft
	(TD42L - all sizes)	36 A/F	135 - 150	100 - 111
2	(TD42H - ½", ¾")	41 A/F	180 - 200	133 - 148
	(TD42H - 1")	55 A/F	250 - 275	184 - 203
5		32 A/F M28	170 - 190	125 - 140

TI-P187-04
CMGT Issue 13

TDC46M
Carbon Steel
Thermodynamic Steam Trap with Maintainable Seat

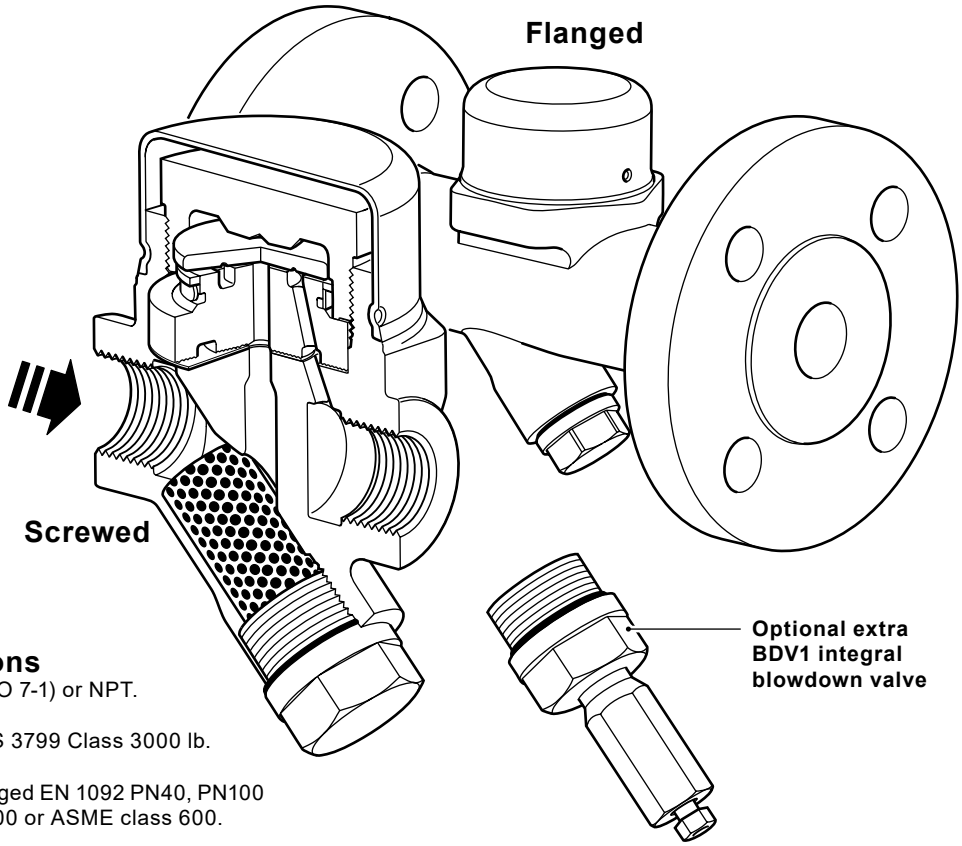
Description
The TDC46M is a carbon steel, thermodynamic steam trap that has been specifically designed for low capacity applications up to 46 bar g (667 psi g) (where pipe connections permit). As standard the unit is available with either screwed, socket weld or flanged connections.

TDC46M benefits:
- Integral strainer.
- Integral air vent.
- Insulation cap.
- Replaceable seat.

Optional extras
At extra cost a **BDV1** integral blowdown valve can be pre-fitted to the strainer cap, please specify at the time of order placement.

Standards
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification
These products are available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be specified at the time of order placement.

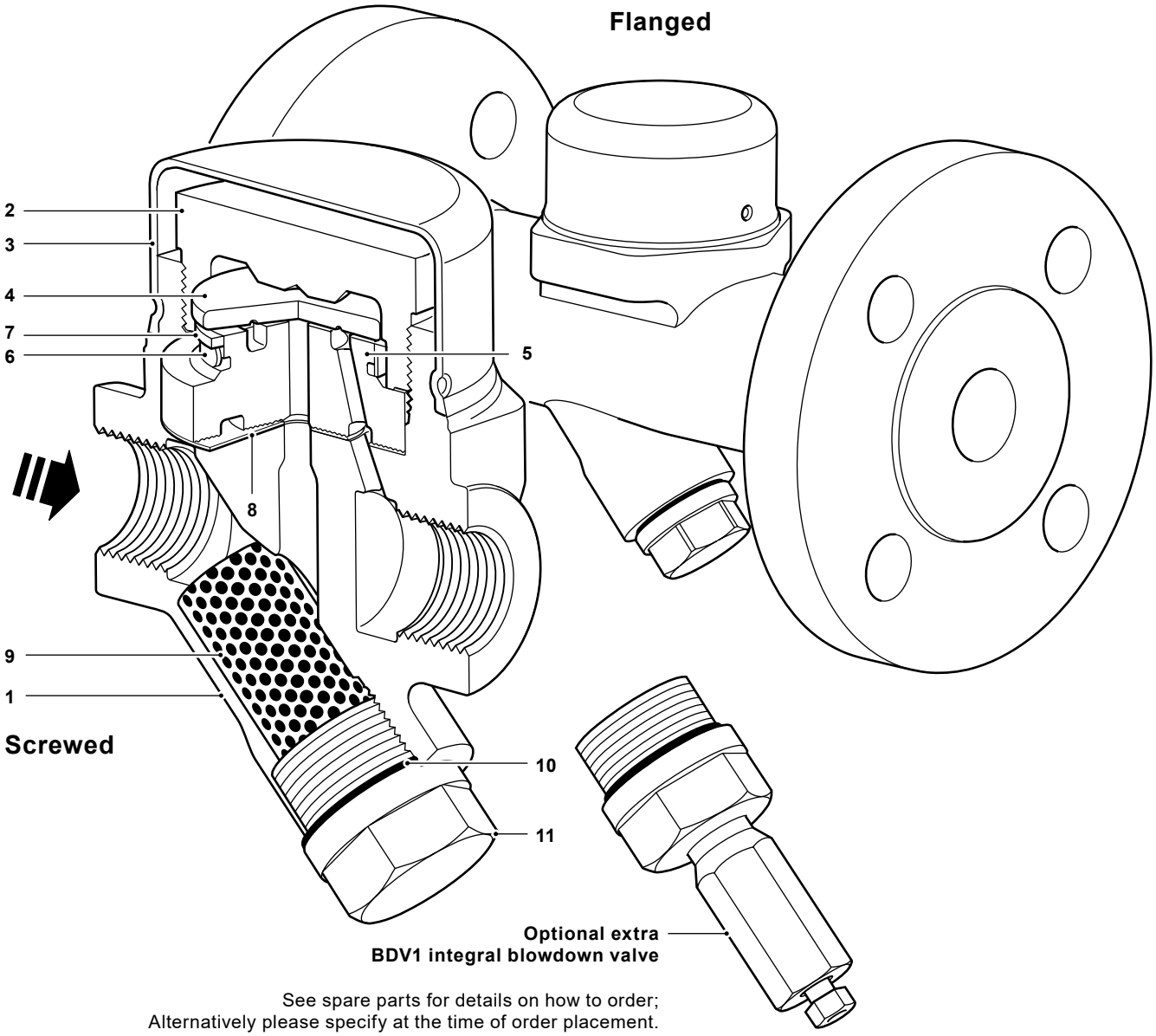


Sizes and pipe connections
½", ¾" and 1" screwed BSP T Rp (ISO 7-1) or NPT.

½", ¾" and 1" socket weld ends to BS 3799 Class 3000 lb.

DN15, DN20 and DN25 integrally flanged EN 1092 PN40, PN100 and ASME class 150, ASME class 300 or ASME class 600.

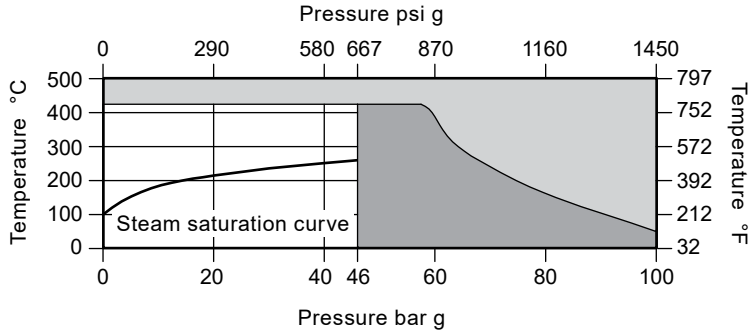
Materials



See spare parts for details on how to order;
Alternatively please specify at the time of order placement.

No.	Part	Material	
1	Body	Carbon steel	1.0619+N / ASTM A216 WCB
2	Top cap	Stainless steel	1.4301 / ASTM 479 304
3	Insulating cover	Stainless steel	EN 10088-1 1.4301
4	Disc	Hardened steel	1.2379
5	Seat	Hardened steel	1.2379
6	Bimetal ring	Bimetal	
7	Support	Stainless steel	AISI 304
8	Seat gasket	Graphite foil	
9	Strainer screen	Stainless steel	ASTM A478 316L
10	Strainer cap gasket	Stainless steel	AISI 304
11	Strainer cap	Stainless steel	1.4308 / ASTM A351 CF8

Pressure/temperature limits (ISO 6552) - Screwed and Socket weld



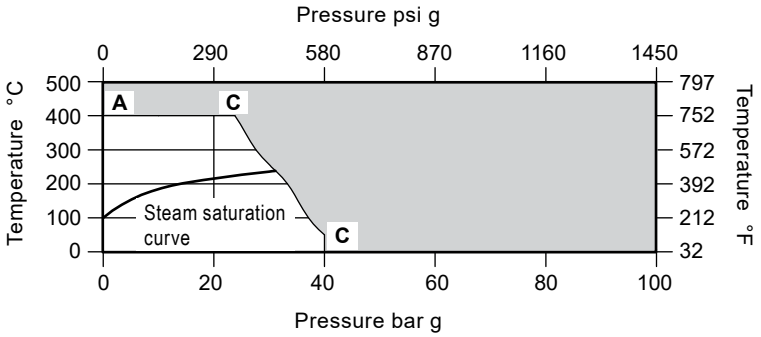
The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

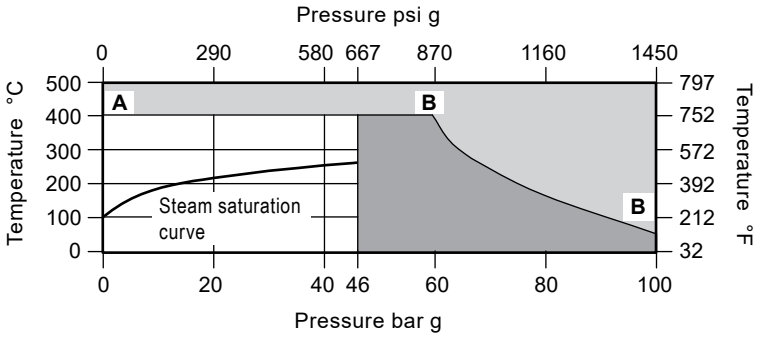
Body design condition		PN100 and ASME Class 600
PMA Maximum allowable pressure	100 bar g @ 50 °C	1450 psi g @ 122 °F
TMA Maximum allowable temperature	425 °C @ 57.5 bar g	797 °F @ 834 psi g
Minimum allowable temperature	-29 °C	-20.2 °F
PMO Maximum operating pressure	46 bar g @ 425 °C	667 psi g @ 797 °F
TMO Maximum operating temperature	425 °C @ 46 bar g	797 °F @ 667 psi g
Minimum operating temperature	0 °C	32 °F
Minimum operating pressure	1.5 bar g	22 psi g
Maximum operating backpressure		80% of upstream pressure
Product is safe for use under full vacuum conditions		
Designed for a maximum cold hydraulic test pressure of:	150 bar g	2176 psi g

Pressure/temperature limits (ISO 6552) - Flanged EN 1092

PN40



PN100



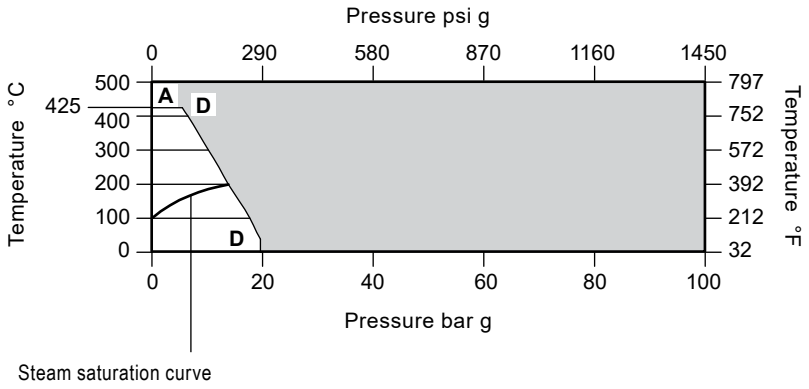
The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

A - B - B	**PN100**	Body design condition		PN100
		PMA Maximum allowable pressure	100 bar g @ 50 °C	1450 psi g @ 122 °F
		TMA Maximum allowable temperature	400 °C @ 59.5 bar g	752 °F @ 863 psi g
		Minimum allowable temperature	-10 °C	14 °F
		PMO Maximum operating pressure	46 bar g @ 400 °C	667 psi g @ 752 °F
		TMO Maximum operating temperature	400 °C @ 46 bar g	752 °F @ 667 psi g
		Minimum operating temperature	0 °C	32 °F
		Minimum operating pressure	1.5 bar g	22 psi g
		Maximum operating backpressure		80% of upstream pressure
		Product is safe for use under full vacuum conditions		
		Designed for a maximum cold hydraulic test pressure of:	150 bar g	2176 psi g
A - C - C	**PN40**	Body design condition		PN40
		PMA Maximum allowable pressure	40 bar g @ 50 °C	580 psi g @ 122 °F
		TMA Maximum allowable temperature	400 °C @ 23.8 bar g	752 °F @ 345 psi g
		Minimum allowable temperature	-10 °C	14 °F
		PMO Maximum operating pressure for saturated steam service	31.1 bar g @ 238 °C	451 psi g @ 460 °F
		TMO Maximum operating temperature	400 °C @ 23.8 bar g	752 °F @ 345 psi g
		Minimum operating temperature	0 °C	32 °F
		Minimum operating pressure	1.5 bar g	22 psi g
		Maximum operating backpressure		80% of upstream pressure
		Product is safe for use under full vacuum conditions		
		Designed for a maximum cold hydraulic test pressure of:	60 bar g	870 psi g

Pressure/temperature limits (ISO 6552) - Flanged ASME

ASME Class 150

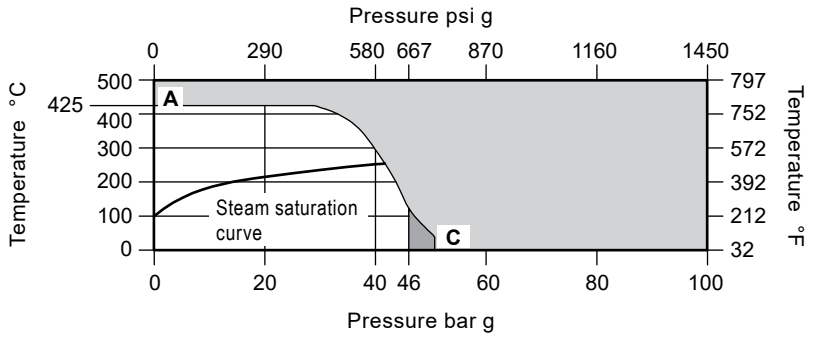


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

	Body design condition		ASME Class 150
	PMA Maximum allowable pressure	19.6 bar g @ 38 °C	284 psi g @ 100 °F
	TMA Maximum allowable temperature	425 °C @ 5.5 bar g	797 °F @ 80 psi g
	Minimum allowable temperature	-29 °C	-20.2 °F
	PMO Maximum operating pressure for saturated steam service	14 bar g	203 psi g
A - D - D	TMO Maximum operating temperature	425 °C @ 5.5 bar g	797 °F @ 80 psi g
	Minimum operating temperature	0 °C	32 °F
	Minimum operating pressure	1.5 barg	22 psi g
	Maximum operating backpressure		80% of upstream pressure
	Product is safe for use under full vacuum conditions		
	Designed for a maximum cold hydraulic test pressure of:	29.4 bar g	22 psi g

Pressure/temperature limits (ISO 6552) - Flanged ASME

ASME Class 300



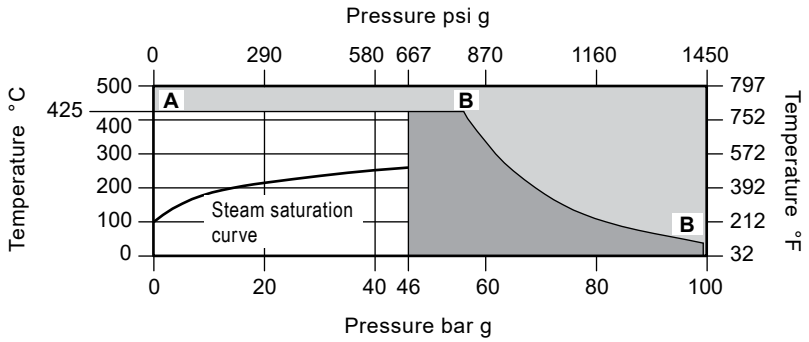
The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

	Body design condition		ASME Class 300
	PMA Maximum allowable pressure	51.1 bar g @ 38 °C	741 psi g @ 100 °F
	TMA Maximum allowable temperature	425 °C @ 28.8 g	797 °F @ 418 psi g
	Minimum allowable temperature	-29 °C	-20.2 °F
	PMO Maximum operating pressure for saturated steam service	43 bar g	624 psi g
A - C	TMO Maximum operating temperature	425 °C @ 28.8 bar g	797 °F @ 418 psi g
	Minimum operating temperature	0 °C	32 °F
	Minimum operating pressure	1.5 bar g	22 psi g
	Maximum operating backpressure		80% of upstream pressure
	Product is safe for use under full vacuum conditions		
	Designed for a maximum cold hydraulic test pressure of:	76.6 bar g	1111 psi g

Pressure/temperature limits (ISO 6552) - Flanged ASME

ASME Class 600

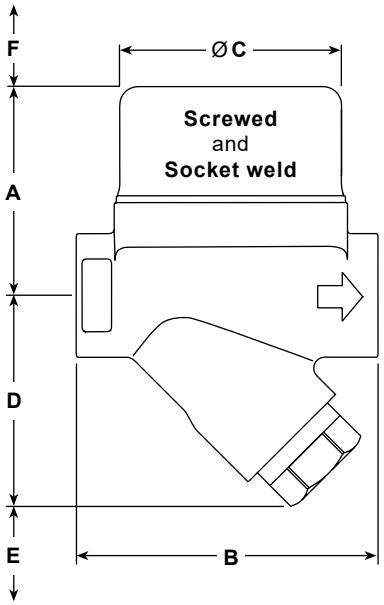


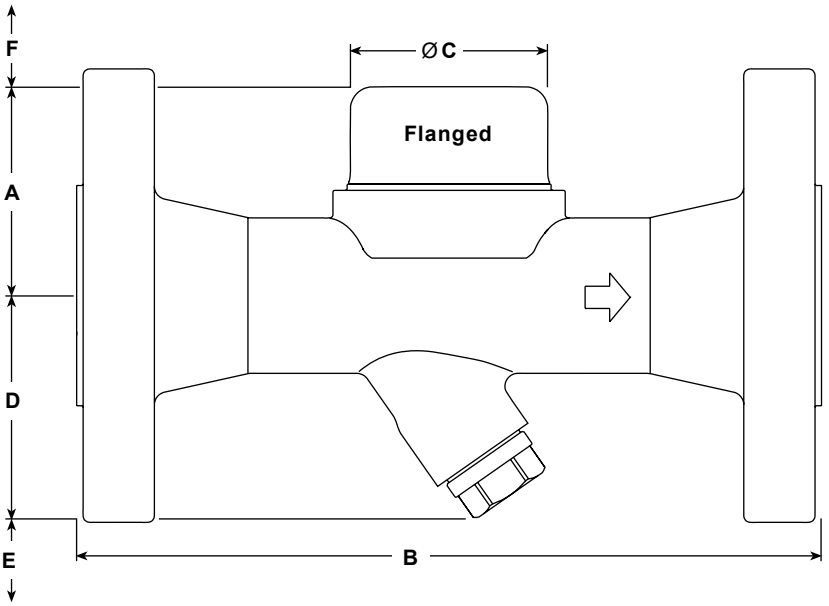
The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

	Body design condition		ASME Class 600
	PMA Maximum allowable pressure	99.3 bar g @ 38 °C	1440 psi g @ 100 °F
	TMA Maximum allowable temperature	425 °C @ 56 bar g	797 °F @ 812 psi g
	Minimum allowable temperature	-29 °C	-20.2 °F
	PMO Maximum operating pressure	46 bar g	667 psi g
A - B - B	TMO Maximum operating temperature	425 °C @ 46 bar g	797 °F @ 667 psi g
	Minimum operating temperature	0 °C	32 °F
	Minimum operating pressure	1.5 bar g	22 psi g
	Maximum operating backpressure		80% of upstream pressure
	Product is safe for use under full vacuum conditions		
	Designed for a maximum cold hydraulic test pressure of:	149 bar g	2161 psi g

Dimensions (approximate) in mm (inches)



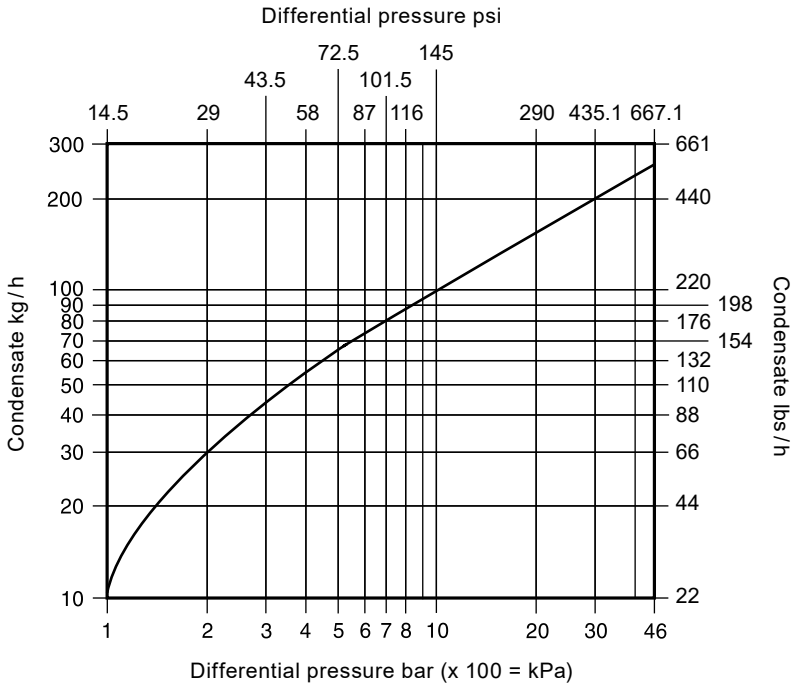


Size	A	B				C	D	E	F
		Screwed	Socket weld	Flanged					
				PN40 ASME 150, 300, 600	PN100			Withdrawal distance	Withdrawal distance
½" DN15	58 (2.28)	78 (3.07)	92 (3.62)	150 (5.91)	210 (8.27)	61 (2.40)	59 (2.32)	40 (1.57)	30 (1.18)
¾" DN20	61 (2.40)	95 (3.74)					63 (2.48)		
1" DN25	65 (2.56)			160 (6.29)	230 (9.06)		67 (2.64)		

Weights (approximate) in kg (lbs)

Size	Screwed	Socket weld	Flanged				
			ASME 150	ASME 300	ASME 600	PN40	PN100
½" DN15	1.38 (3.04)	1.49 (3.28)	2.46 (5.42)	2.96 (6.53)	3.06 (6.75)	3.06 (6.75)	4.36 (9.61)
¾" DN20	1.64 (3.62)	1.64 (3.62)	3.16 (6.97)	4.06 (8.95)	4.26 (9.39)	3.96 (8.73)	6.26 (13.8)
1" DN25	1.90 (4.19)	1.90 (4.19)	4.16 (9.17)	5.16 (11.4)	5.46 (12.0)	4.86 (10.7)	8.16 (18.0)

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P187-05) supplied with the product.

Installation note:

The TDC46M is designed for installation with the disc in a horizontal plane with the insulating cover at the top.

It is recommended that a non-return valve is fitted when discharging condensate into return lines where backpressure is experienced. It is also recommended that a diffuser is fitted when discharging to atmosphere.

For ease and maintenance, consideration should be given to fitting isolation valves upstream and downstream of the steam trap.

How to order

Example: 1 off Spirax Sarco DN15 TDC46M thermodynamic steam trap having flanged EN 1092 PN40 connections.

Spare parts

Please note that the spares shown are the same for the screwed, socket weld and flanged versions.
The spare parts available are shown in solid outline.
Parts drawn in a grey line are not supplied as spares.

Available spares

Insulating cover	**3**
Top cap, seat and disc assembly	**2**, **4**, **5**, **6**, **7**, **8**
Strainer screen and gasket	**9**, **10**
Set of gaskets (packet of 3 sets)	**8**, **10**
BDV1 blowdown valve retrofit kit	

How to order spares

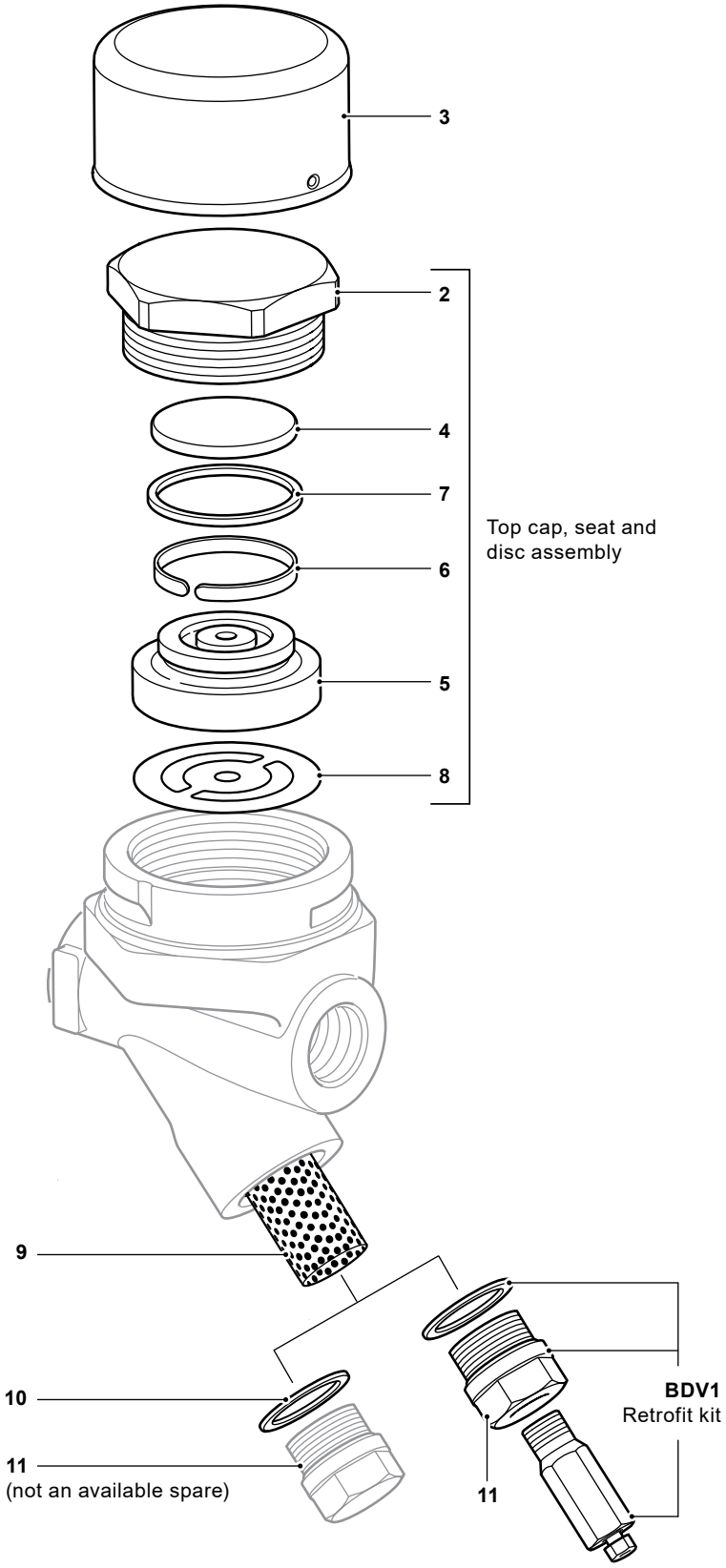
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.

Example: 1 off Top cap, seat and disc assembly for a Spirax Sarco DN15 TDC46M thermodynamic steam trap.

Cautionary note regarding disassembly and assembly of the unit:

Removal of the following parts:

- top cap (2),
- strainer cap (11) and the
- optional BDV2 retrofit kit should be carried out in a workshop, not whilst the trap is installed inline. For socket weld installations the unit can be maintained inline however care should be taken to avoid damage to pipework.



Recommended tightening torques (for suitably lubricated threads)

Item	Part	mm	N m	(lbf ft)
2	Top cap	50 A/F	300	221
11	Strainer cap	24 A/F	105 - 110	81

TI-P187-02
CMGT Issue 12

TDS46M
Stainless Steel
Thermodynamic Steam Trap with Maintainable Seat

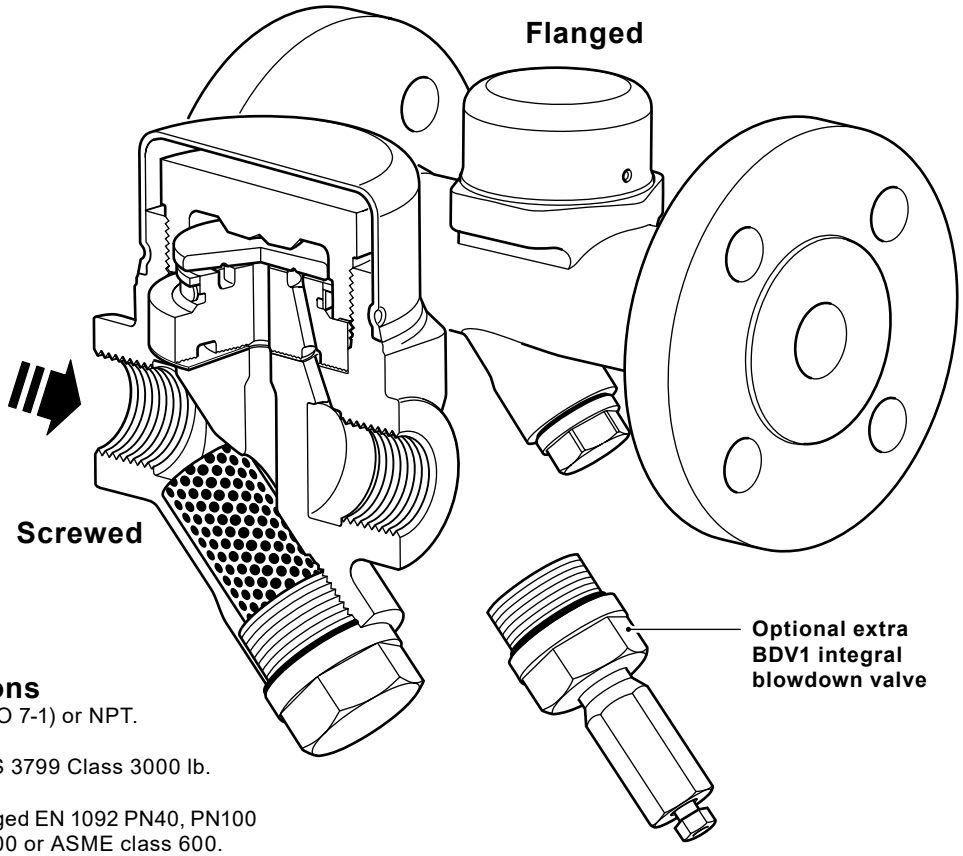
Description
The TDS46M is a stainless steel, thermodynamic steam trap that has been specifically designed for low capacity applications up to 46 bar g (667 psi g) (where pipe connections permit).
As standard the unit is available with either screwed, socket weld or flanged connections.

TDS46M benefits:
- Integral strainer.
- Integral air vent.
- Insulation cap.
- Replaceable seat.

Optional extras
At extra cost a **BDV1** integral blowdown valve can be pre-fitted to the strainer cap, please specify at the time of order placement.

Standards
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification
These products are available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be specified at the time of order placement.

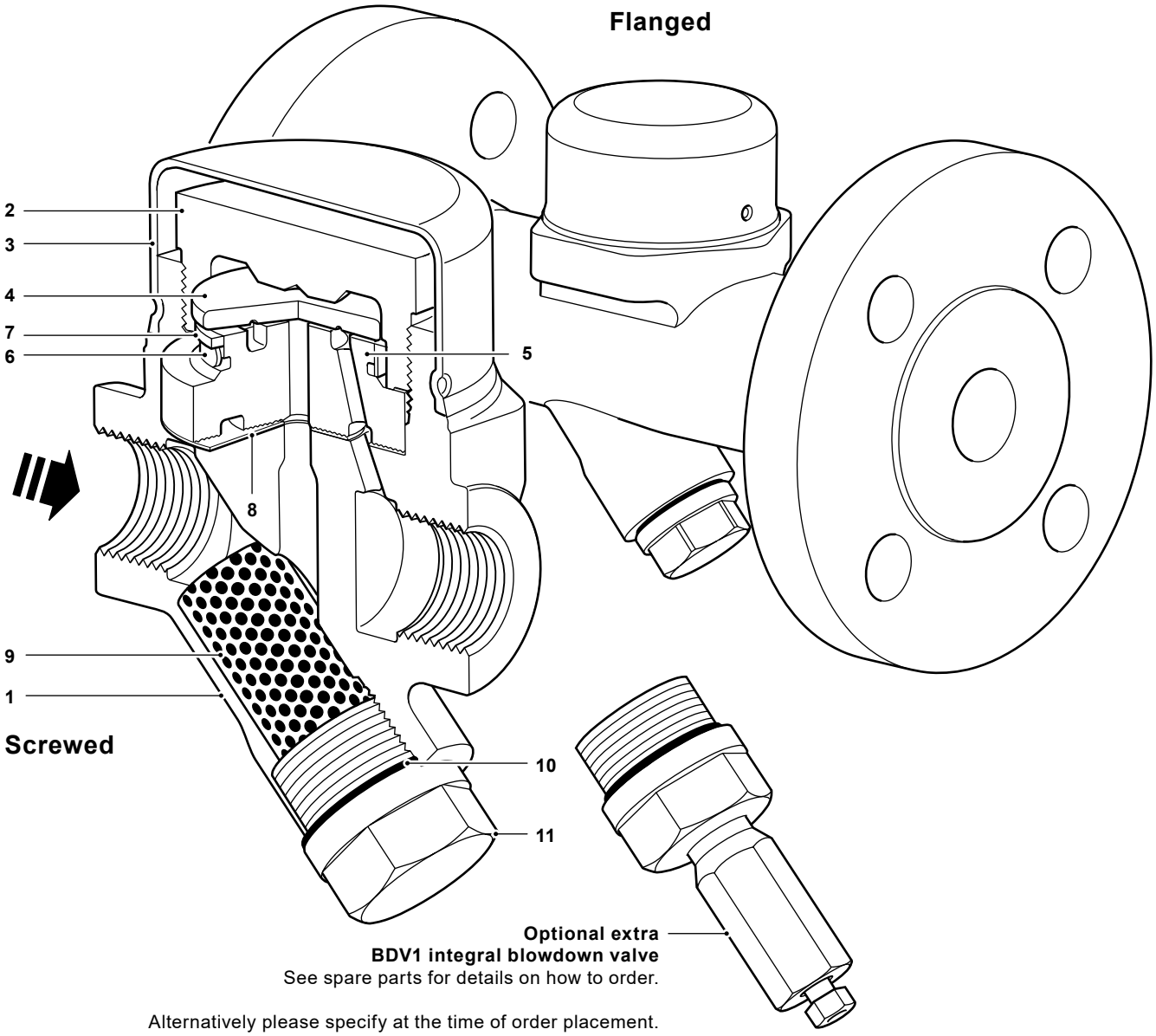


Sizes and pipe connections
½", ¾" and 1" screwed BSP T Rp (ISO 7-1) or NPT.

½", ¾" and 1" socket weld ends to BS 3799 Class 3000 lb.

DN15, DN20 and DN25 integrally flanged EN 1092 PN40, PN100 and ASME class 150, ASME class 300 or ASME class 600.

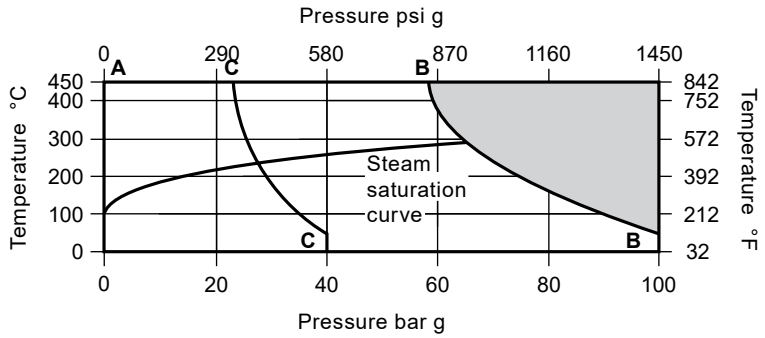
Materials



No.	Part	Material	
1	Body	Stainless steel	1.4308/ASTM A351 CF8
2	Top cap	Stainless steel (ENP coated)	1.4301/ASTM A479 304
3	Insulating cover	Stainless steel	EN 10088-1 1.4301
4	Disc	Hardened steel	1.2379
5	Seat	Hardened steel	1.2379
6	Bimetal ring	Bimetal	
7	Support	Stainless steel	AISI 304
8	Seat gasket	Graphite foil	
9	Strainer screen	Stainless steel	ASTM A478 316L
10	Strainer cap gasket	Stainless steel	AISI 304
11	Strainer cap	Stainless steel (ENP coated)	1.4308/ASTM A351 CF8

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged EN 1092

Screwed
Socket weld
Flanged:
PN40
PN100

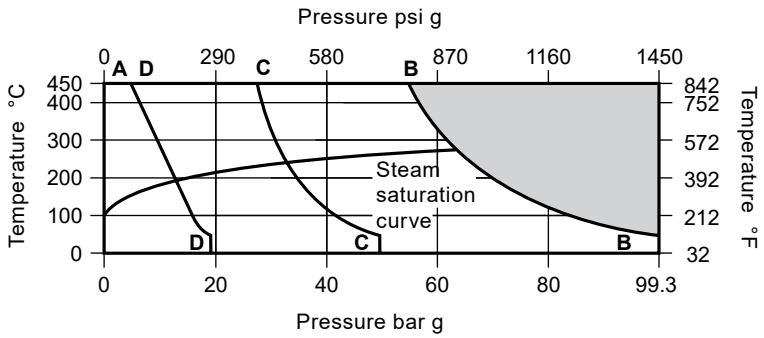


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

A - B - B	**PN100 Screwed Socket weld**	Body design conditions		PN100
		PMA Maximum allowable pressure	100 bar g @ 50 °C	1450 psi g @ 122 °F
		TMA Maximum allowable temperature	450 °C @ 58.3 bar g	842 °F @ 846 psi g
		Minimum allowable temperature	-50 °C	-58 °F
		PMO Maximum operating pressure	46 bar g @ 450 °C	667 psi g @ 842 °F
		TMO Maximum operating temperature	450 °C @ 46 bar g	842 °F @ 667 psi g
		Minimum operating temperature	0 °C	32 °F
		Minimum operating pressure	1.5 bar g	22 psi g
		Maximum operating backpressure		80% of upstream pressure
		Product is safe for use under full vacuum conditions		
		Designed for a maximum cold hydraulic pressure of:	150 bar g	2176 psi g
A - C - C	**PN40**	Body design conditions		PN40
		PMA Maximum allowable pressure	40 bar g @ 50 °C	580 psi g @ 122 °F
		TMA Maximum allowable temperature	450 °C @ 23.3 bar g	842 °F @ 338 psi g
		Minimum allowable temperature	-50 °C	-58 °F
		PMO Maximum operating pressure for saturated steam service	28.4 bar g @ 233 °C	412 psi g @ 451 °F
		TMO Maximum operating temperature	450 °C @ 23.3 bar g	842 °F @ 338 psi g
		Minimum operating temperature	0 °C	32 °F
		Minimum operating pressure	1.5 bar g	22 psi g
		Maximum operating backpressure		80% of upstream pressure
		Product is safe for use under full vacuum conditions		
		Designed for a maximum cold hydraulic pressure of:	60 bar g	870 psi g

Pressure/temperature limits (ISO 6552) - Flanged ASME

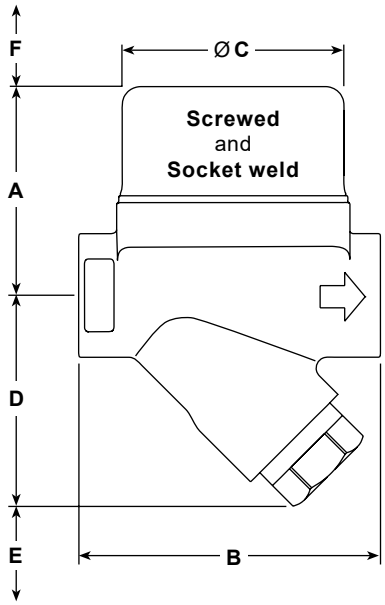
Flanged:
ASME Class 150
ASME Class 300
ASME Class 600

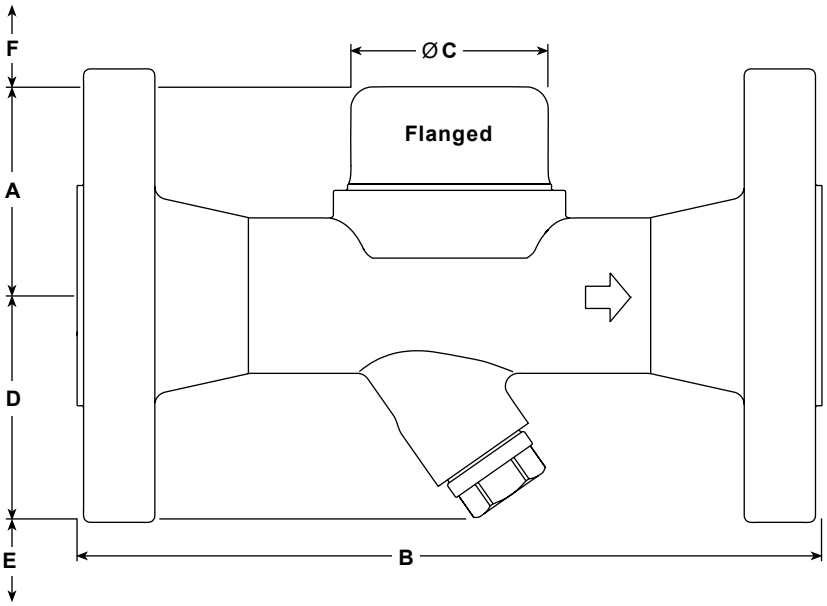


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

A - B - B	**ASME 600**	Body design conditions		ASME Class 600
		PMA Maximum allowable pressure	99.3 bar g @ 38 °C	1440 psi g @ 100 °F
		TMA Maximum allowable temperature	450 °C @ 54.8 bar g	842 °F @ 795 psi g
		Minimum allowable temperature	-50 °C	-58 °F
		PMO Maximum operating pressure	46 bar g	667 psi g
		TMO Maximum operating temperature	450 °C @ 46 bar g	842 °F @ 667 psi g
		Minimum operating temperature	0 °C	32 °F
		Minimum operating pressure	1.5 bar g	22 psi g
		Maximum operating backpressure		80% of the upstream pressure
		Product is safe for use under full vacuum conditions		
		Designed for a maximum cold hydraulic pressure of:	149 bar g	2161 psi g
A - C - C	**ASME 300**	Body design conditions		ASME Class 300
		PMA Maximum allowable pressure	49.6 bar g @ 38 °C	719 psi g @ 100 °F
		TMA Maximum allowable temperature	450 °C @ 27.4 bar g	842 °F @ 397 psi g
		Minimum allowable temperature	-50 °C	-58 °F
		PMO Maximum operating pressure for saturated steam service	33 bar g	479 psi g
		TMO Maximum operating temperature	450 °C @ 27.4 bar g	842 °F @ 397 psi g
		Minimum operating temperature	0 °C	32 °F
		Minimum operating pressure	1.5 bar g	22 psi g
		Maximum operating backpressure		80% of the upstream pressure
		Product is safe for use under full vacuum conditions		
		Designed for a maximum cold hydraulic pressure of:	74.4 bar g	1079 psi g
A - D - D	**ASME 150**	Body design conditions		ASME Class 150
		PMA Maximum allowable pressure	19 bar g @ 38 °C	276 psi g @ 100 °F
		TMA Maximum allowable temperature	450 °C @ 4.6 bar g	842 °F @ 67 psi g
		Minimum allowable temperature	-50 °C	-58 °F
		PMO Maximum operating pressure for saturated steam service	14 bar g	203 psi g
		TMO Maximum operating temperature	450 °C @ 4.6 bar g	842 °F @ 67 psi g
		Minimum operating temperature	0 °C	32 °F
		Minimum operating pressure	1.5 bar g	22 psi g
		Maximum operating backpressure		80% of the upstream pressure
		Product is safe for use under full vacuum conditions		
		Designed for a maximum cold hydraulic pressure of:	28.5 bar g	22 psi g

Dimensions (approximate) in mm (in)



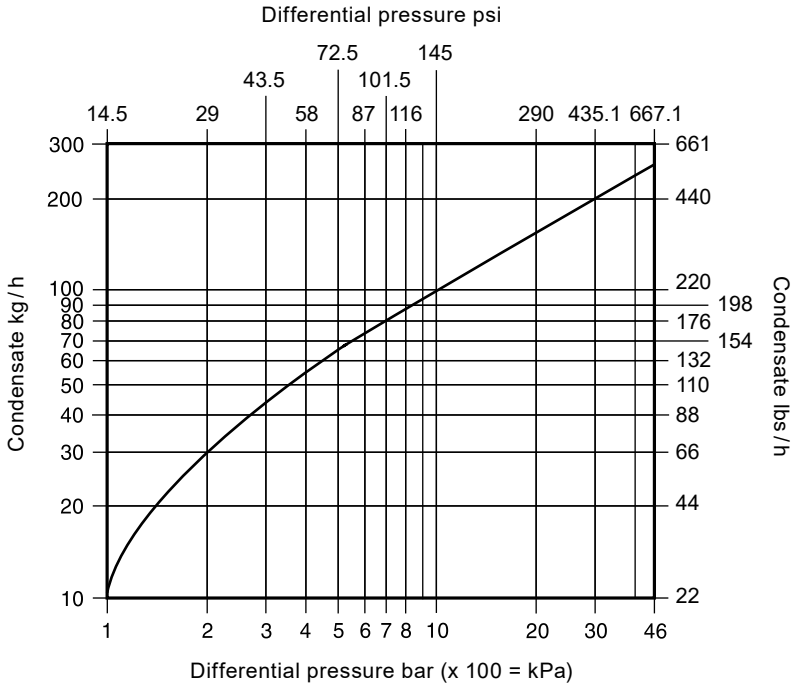


Size	A	B				C	D	E	F
		Screwed	Socket weld	Flanged				Withdrawal distance	Withdrawal distance
				PN40 ASME 150, 300, 600	PN100				
½" DN15	58 (2.28)	78 (3.07)	92 (3.62)	150 (5.91)	210 (8.27)	61 (2.40)	59 (2.32)	40 (1.57)	30 (1.18)
¾" DN20	61 (2.40)	95 (3.74)					63 (2.48)		
1" DN25	65 (2.56)			160 (6.29)	230 (9.06)		67 (2.64)		

Weights (approximate) in kg (lbs)

Size	Screwed	Socket weld	Flanged				
			ASME 150	ASME 300	ASME 600	PN40	PN100
½" DN15	1.38 (3.04)	1.49 (3.28)	2.46 (5.42)	2.96 (6.53)	3.06 (6.75)	3.06 (6.75)	4.36 (9.61)
¾" DN20	1.64 (3.62)	1.64 (3.62)	3.16 (6.97)	4.06 (8.95)	4.26 (9.39)	3.96 (8.73)	6.26 (13.8)
1" DN25	1.90 (4.19)	1.90 (4.19)	4.16 (9.17)	5.16 (11.4)	5.46 (12.0)	4.86 (10.7)	8.16 (18.0)

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P187-05) supplied with the product.

Installation note:

The TDS46M is designed for installation with the disc in a horizontal plane with the insulating cover at the top.

It is recommended that a non-return valve is fitted when discharging condensate into return lines where backpressure is experienced. It is also recommended that a diffuser is fitted when discharging to atmosphere.

For ease and maintenance, consideration should be given to fitting isolation valves upstream and downstream of the steam trap.

How to order

Example: 1 off Spirax Sarco DN15 TDS46M thermodynamic steam trap having flanged EN 1092 PN40 connections.

Spare parts

Please note that the spares shown are the same for the screwed, socket weld and flanged versions.
The spare parts available are shown in solid outline.
Parts drawn in a grey line are not supplied as spares.

Available spares

Insulating cover	**3**
Top cap, seat and disc assembly	**2**, **4**, **5**, **6**, **7**, **8**
Strainer screen and gasket	**9**, **10**
Set of gaskets (packet of 3 sets)	**8**, **10**
BDV1 blowdown valve retrofit kit	

How to order spares

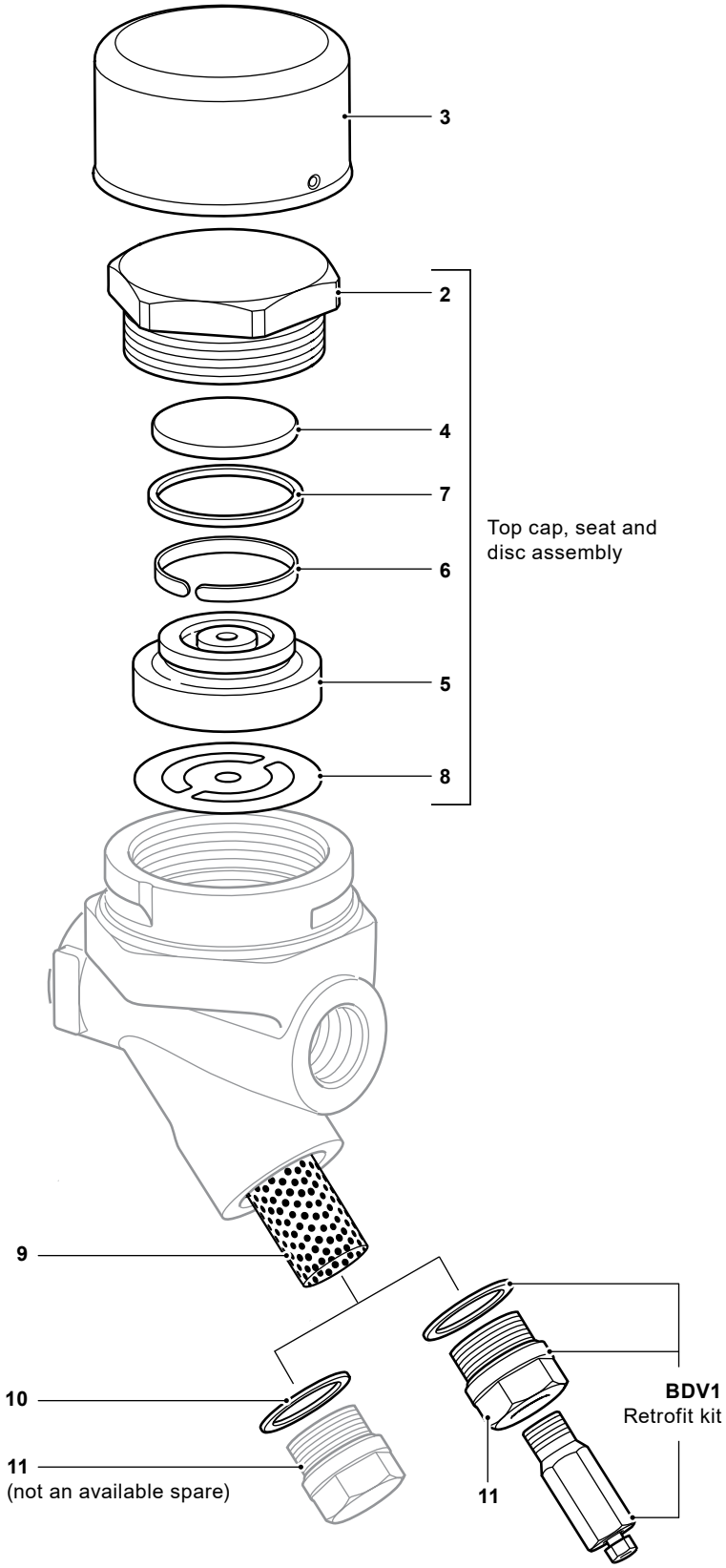
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.

Example: 1 off Top cap, seat and disc assembly for a Spirax Sarco DN15 TDS46M thermodynamic steam trap.

Cautionary note regarding disassembly and assembly of the unit:

Removal of the following parts:

- top cap (2),
- strainer cap (11) and the
- optional BDV2 retrofit kit should be carried out in a workshop, not whilst the trap is connected to the pipeline (PC) connector.



Recommended tightening torques (for suitably lubricated threads)

Item	Part	mm	N m	(lbf ft)
2	Top cap	50 A/F	400	295
11	Strainer cap	24 A/F	110	46.5 - 48.7

TI-P068-08
CMGT Issue 13

TD62LM and TD62M Thermodynamic Steam Traps with replaceable seats (Screwed/Socket Weld)

Description

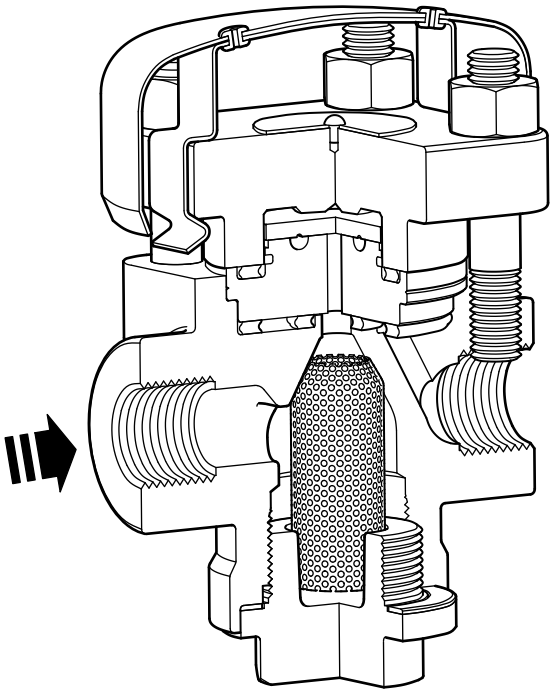
The **TD62LM** and **TD62M** are maintainable high pressure thermodynamic steam traps with integral strainer and a replaceable seat to ease maintenance. They have been specifically designed for mains drainage applications up to 62 bar g (899 psi g).
The **TD62LM** is specifically designed for relatively small condensate loads on superheat and mains drainage applications. An insulating cover is fitted as standard to prevent the trap being unduly influenced by excessive heat loss when subjected to low outside temperatures, wind, rain etc.
The body and cover meet typical industry standards including Charpy testing at 27J @ -29 °C (-20 °F).

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.



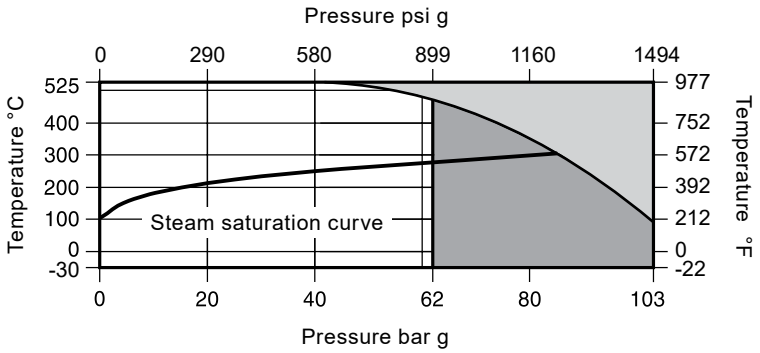
Sizes and pipe connections

½", ¾" and **1**" screwed ends NPT.
½", ¾" and **1**" socket weld ends to ANSI B 16.11 Class 3000.

Optional extras

An optional blowdown/depressurisation valve can be supplied at extra cost - please consult Spirax Sarco.

Pressure/temperature limits

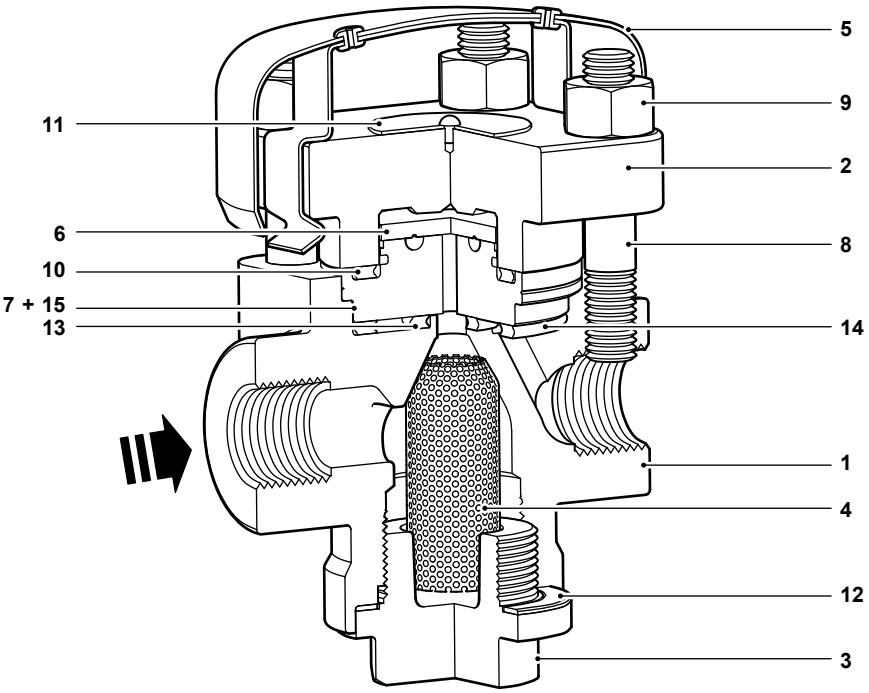


The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Body design conditions				ANSI 600
PMA	Maximum allowable pressure		103 bar g @ 93 °C	1494 psi g @ 199 °F
TMA	Maximum allowable temperature		525 °C @ 42.7 bar g	977 °F @ 619 psi g
Minimum ambient temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for steam service		62 bar g @ 482 °C	899 psi g @ 900 °F
TMO	Maximum operating temperature		525 °C @ 42.7 bar g	977 °F @ 619 psi g
Minimum operating temperature			0 °C	32 °F
PMOB	Maximum operating pressure backpressure	**TD62LM**		50% of upstream
		TD62M		80% of upstream pressure
Minimum operating pressure		**TD62LM**	8 bar g	116 psi g
		TD62M	1.4 bar g	20 psi g
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of			155 bar g	2248 psi g

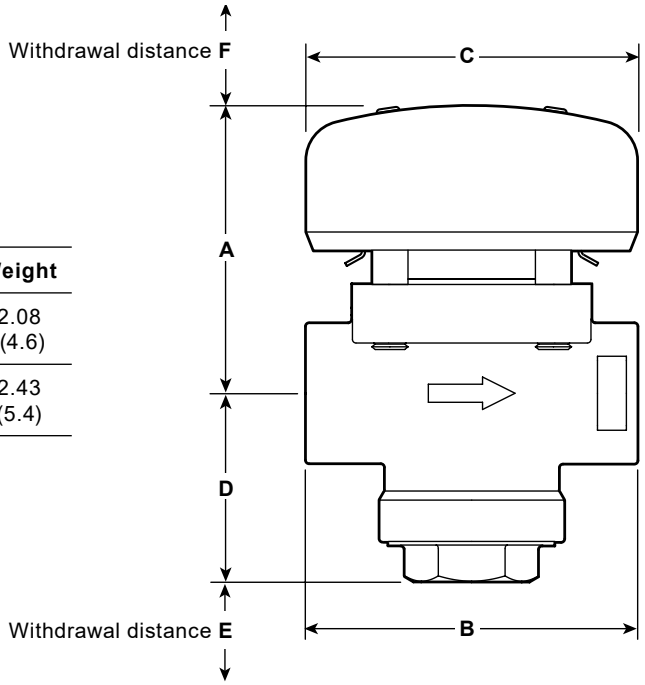
Materials



No.	Part	Material	
1	Body	Steel	ASTM A217 Gr. WC 6
2	Cover	Steel	ASTM A217 Gr. WC 6
3	Strainer cap	Steel	ASTM A217 Gr. WC 6
4	Strainer screen	Stainless steel 100 mesh	316L
5	Insulating cover	Aluminium	
6	Disc	Chromium steel	
7 *	Seat	Chromium steel	
8	Cover studs	Steel	ASTM A193 Gr. B16
9	Cover nuts	Steel	ASTM A194 Gr. 8M
10	Cover gasket	Spirally wound stainless steel with exfoliated graphite filler	
11	Name-plate	Stainless steel	
12	Strainer cap gasket	Reinforced exfoliated graphite	
13	Inner seat gasket	Spirally wound stainless steel with exfoliated graphite filler	
14	Outer seat gasket	Spirally wound stainless steel with exfoliated graphite filler	
15 *	Ferrule	Stainless steel	

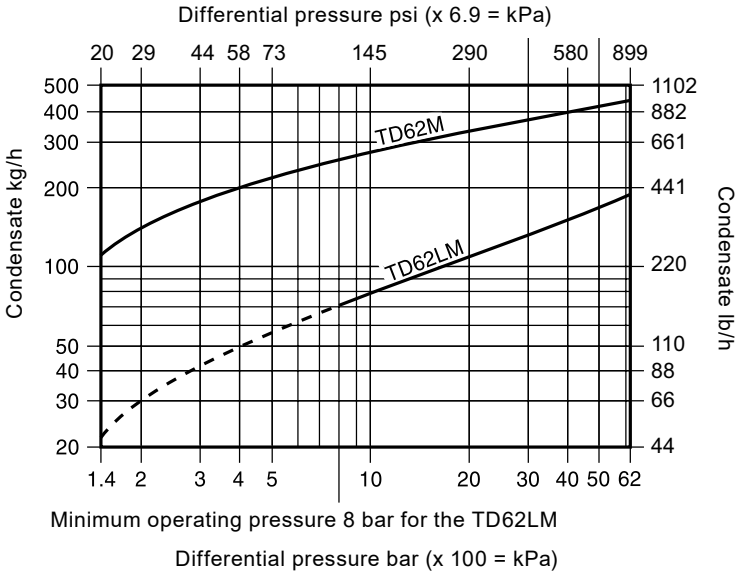
*** Note:** Item **15** (ferrule) is pressed into item **7** (seat).

Dimensions/weights
(approximate) in mm (inches) and kg (lbs)



Size	A	B	C	D	E	F	Weight
½" ¾"	80 (3.1)	92 (3.6)	92 (3.6)	52 (2.1)	20 (0.8)	51 (2.0)	2.08 (4.6)
1"	85 (3.3)	100 (3.9)	92 (3.6)	47 (1.9)	20 (0.8)	51 (2.0)	2.43 (5.4)

Capacities



Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-P015-04) supplied with the product.

Installation note:
Preferably install in horizontal pipelines with the insulating cover uppermost although it can be fitted in other positions.
After 24 hours in service the cover nuts should be checked for tightness.

Disposal
The product is recyclable no ecological hazard is anitcipated with the disposal of this product, providing due care is taken.

How to order
Example: 1 off Spirax Sarco ½" TD62LM thermodynamic steam trap with integral strainer having screwed NPT connections, suitable for steam main drainage. An aluminium insulating cover shall be fitted as standard.

Spare parts

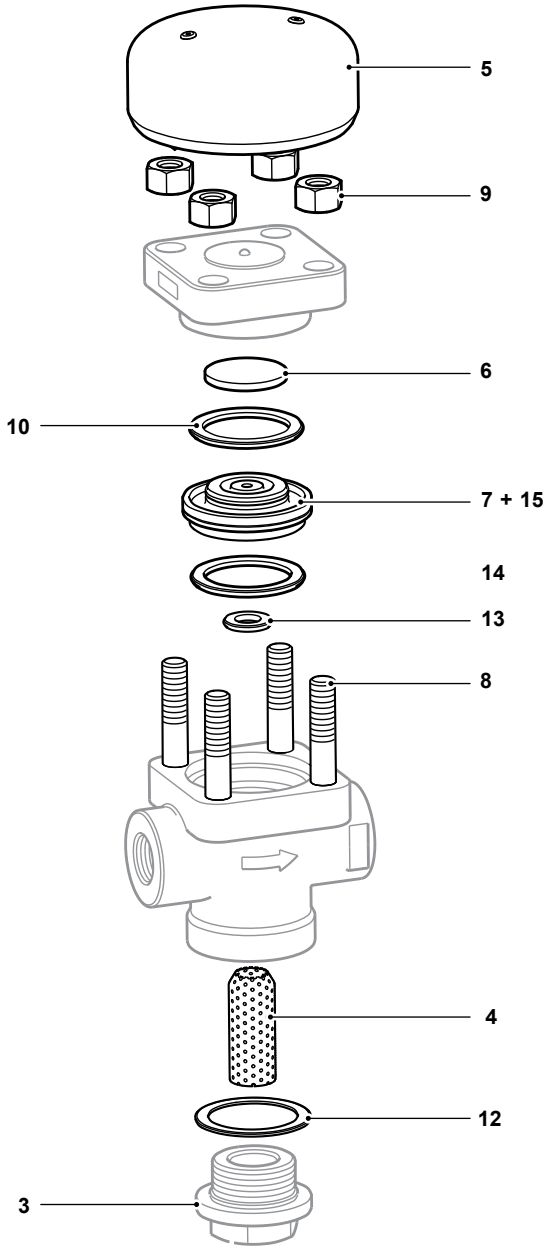
The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Insulating cover	**5**
Set of cover studs and nuts (set of 4)	**8, 9**
Seat and disc assembly	**6, 7, 10, 13, 14, 15**
Strainer screen 100 mesh	**4**
Set of gaskets (packet of 3 sets)	**10, 12, 13, 14**
Strainer cap gasket (3 off)	**12**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.
Example: 1 - Strainer screen for a Spirax Sarco ½" TD62LM thermodynamic steam trap.



Recommended tightening torques

Item	or mm	N m	ft lbf
3	32 A/F	142 - 158	105 - 117
8	M10 x 1.5	20 - 25	15 - 19
9	17 A/F	45 - 50	33 - 37

TI-P068-20
CMGT Issue 13

TD62LM & TD62M Thermodynamic Steam Traps with replaceable seats ASTM Body (Flanged connections)

Description

The **TD62LM** and **TD62M** are maintainable high pressure thermodynamic steam traps with integral strainer and a replaceable seat to ease maintenance. They have been specifically designed for mains drainage applications up to 62 bar g (899 psi g).
The **TD62LM** is specifically designed for relatively small condensate loads on superheat and mains drainage applications. An insulating cover is fitted as standard to prevent the trap being unduly influenced by excessive heat loss when subjected to low ambient temperatures, wind or rain.
The body and cover meet typical industry standards including Charpy impact testing of 27J @ -29 °C (-20 °F) available with certification to EN 10204 3.1.

Standards

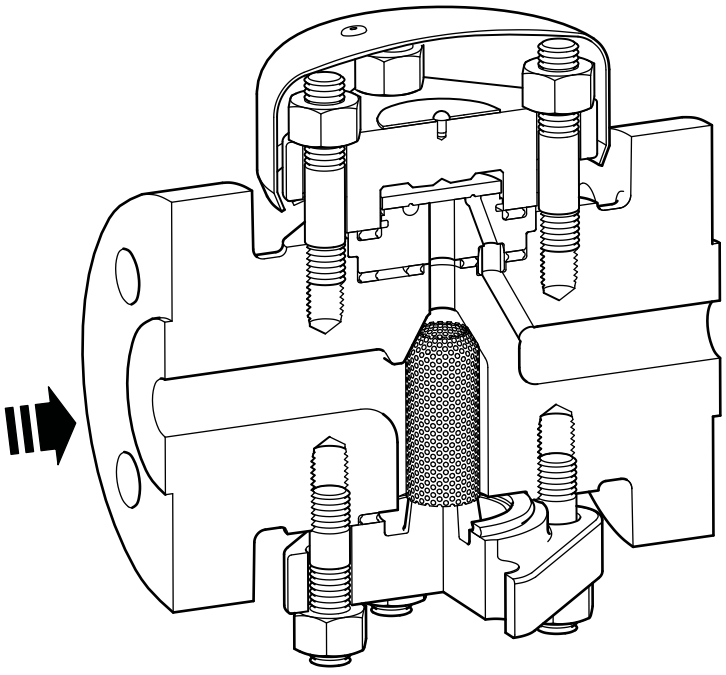
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

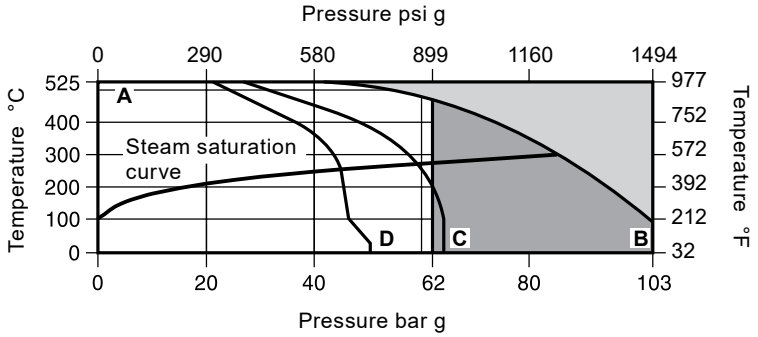
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

DN15, DN20 and DN25
Standard flange to ANSI B 16.5 Class 300 and 600, and JIS/KS 40K.
ANSI Class 150 RF connections are available to special order.



Pressure/temperature limits



The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

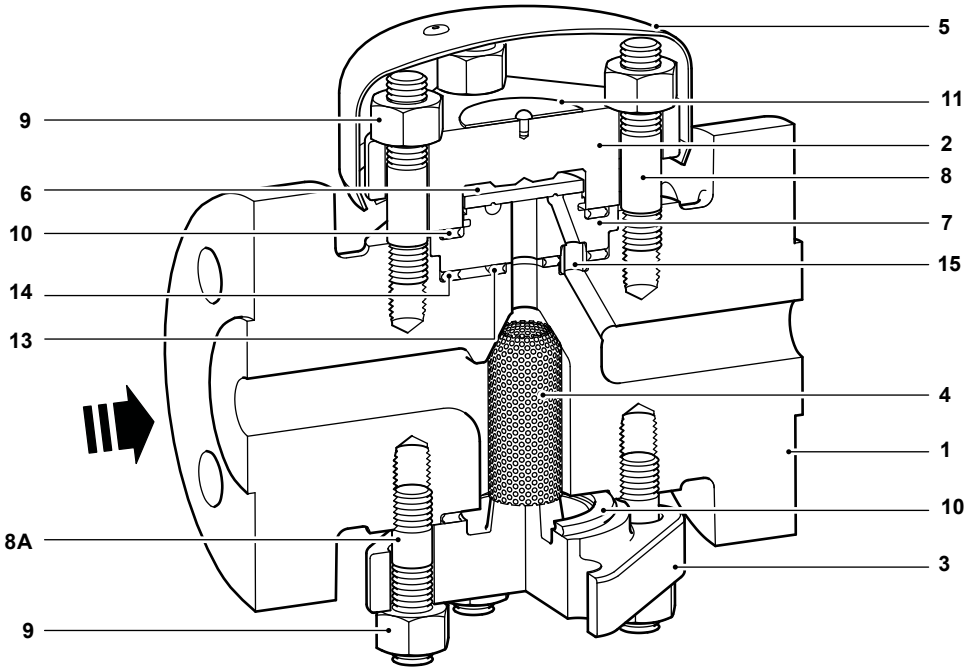
A - B Flanged to ANSI B 16.5 Class 600.

A - C Flanged to JIS/KS 40K.

A - D Flanged to ANSI B 16.5 Class 300.

Body design conditions				ANSI 600
PMA	Maximum allowable pressure		103 bar g @ 93 °C	1494 psi g @ 199 °F
TMA	Maximum allowable temperature		525 °C @ 42.7 bar g	977 °F @ 619 psi g
Minimum ambient temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for steam service		62 bar g @ 482 °C	899 psi g @ 900 °F
TMO	Maximum operating temperature		525 °C @ 42.7 bar g	977 °F @ 619 psi g
Minimum operating temperature			0 °C	32 °F
PMOB	Maximum operating backpressure	**TD62LM**		50% of upstream pressure
		TD62M		80% of upstream pressure
Minimum operating pressure		**TD62LM**	8 bar g	116 psi g
		TD62M	1.4 bar g	20 psi g
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of			155 bar g	2248 psi g

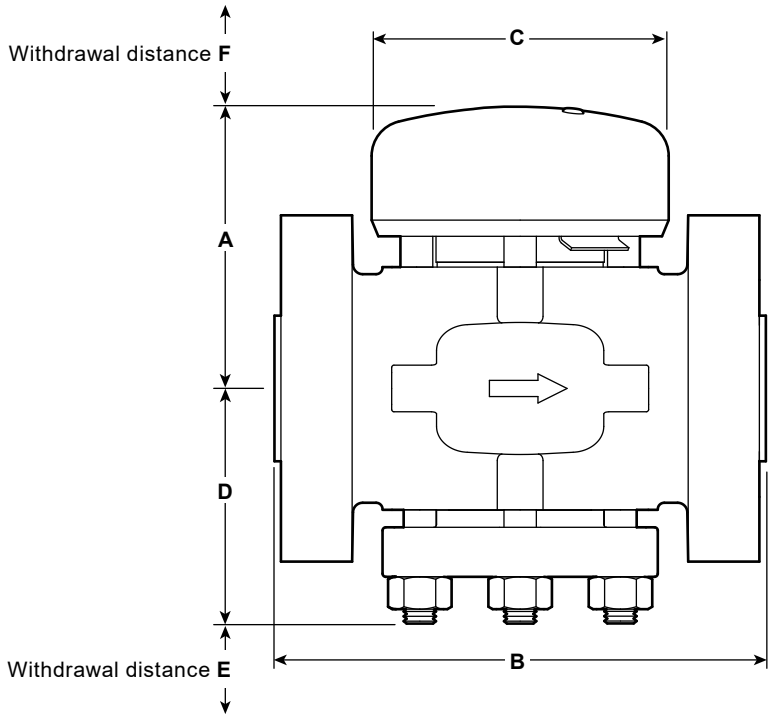
Materials



No.	Part	Material	
1	Body	Steel	ASTM A217 WC6
2	Top cover	Steel	ASTM A217 WC6
3	Bottom cover	Steel	ASTM A217 WC6
4	Strainer screen	Stainless steel 100 mesh	316L
5	Insulating cover	Aluminium	
6	Disc	Chromium steel	
7 *	Seat	Chromium steel	
8	Cover studs (top)	Steel	ASTM A193 B16
8A	Cover studs (bottom)	Steel	ASTM A193 B16
9	Cover nuts	Steel	ASTM A194 8M
10	Cover gaskets	Spirally wound stainless steel with exfoliated graphite filler	
11	Name-plate	Stainless steel	
13	Inner seat gasket	Spirally wound stainless steel with exfoliated graphite filler	
14	Outer seat gasket	Spirally wound stainless steel with exfoliated graphite filler	
15 *	Ferrule	Stainless steel	

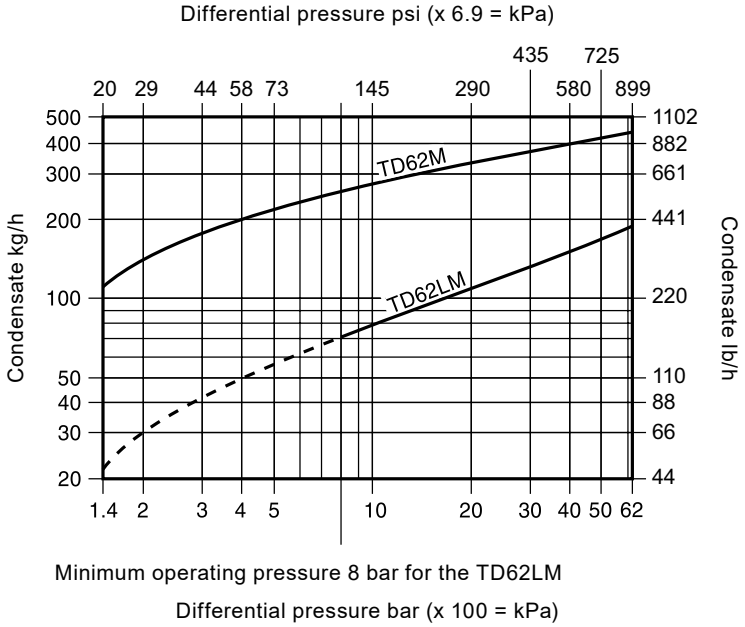
Note: Item **15** (ferrule) is pressed into item **7** (seat).

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	A	ANSI 600 B	ANSI 300 B	JIS/KS 40K B	C	D	E	F	Weight
DN15 (½")	87 (3.4)	147 (5.8)	135 (5.3)	146 (5.7)	92 (3.6)	72 (2.8)	40 (1.6)	30 (1.2)	8.5 (18.7)
DN20 (¾")		151 (5.9)	138 (5.4)						
DN25 (1")		160 (6.3)	147 (5.8)	156 (6.1)					9.1 (20.1)

Capacities



Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-P068-58) supplied with the product.

Installation note:
Preferably install in horizontal pipelines with the insulating cover uppermost although it can be fitted in other positions.
After 24 hours in service the cover nuts should be checked for tightness.

Disposal
The product is recyclable no ecological hazard is anitcipated with the disposal of this product, providing due care is taken.

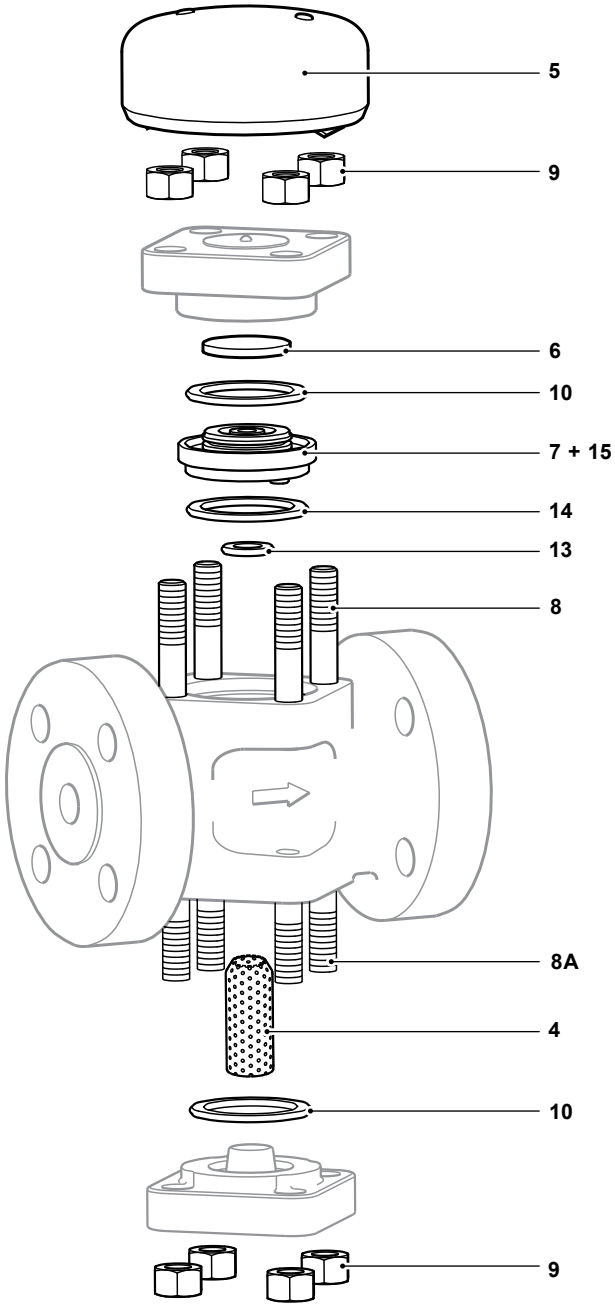
How to order
Example: 1 off Spirax Sarco DN20 TD62LM thermodynamic steam trap with ASTM steel body having an integral strainer having a replaceable seat and flanged ANSI 600 connections suitable for steam mains drainage. An aluminium insulating cover shall be fitted as standard.

Spare parts
The spare parts available are shown in solid outline. Parts shown in a grey line are not supplied as spares.

Available spares

Insulating cover	**5**
Set of cover studs and nuts (set of 8)	**8**, **8A**, **9**
Seat and disc assembly	**6, 7, 10, 13, 14, 15**
Strainer screen 100 mesh	**4**
Set of gaskets (packet of 3 sets)	**10, 13, 14**
Cover gasket (3 off)	**10**

How to order spares
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.
Example: 1 - Strainer screen for a Spirax Sarco DN25 TD62LM thermodynamic steam trap (ASTM body).



Recommended tightening torques

Item	or mm	N m	ft lbf
8 and 8A	M10 x 1.5	20 - 25	15 - 19
9	17 A/F	45 - 50	33 - 37

TI-P150-11
CMGT Issue 6

TD120M

High Pressure Thermodynamic Steam Trap with Replaceable Seat

Description

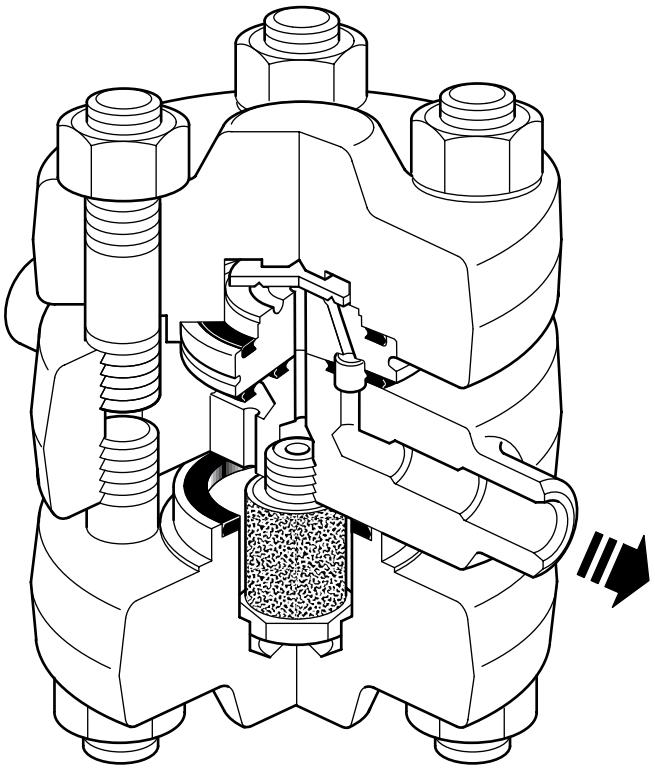
The TD120M is a maintainable high pressure thermodynamic steam trap with integral strainer and a replaceable seat to ease maintenance, which can be supplied in ½", ¾" and 1" sizes with socket weld, butt weld or flanged connections.
It has low capacity specifically designed for superheated mains drainage applications up to 250 bar g (3626 psi g).

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

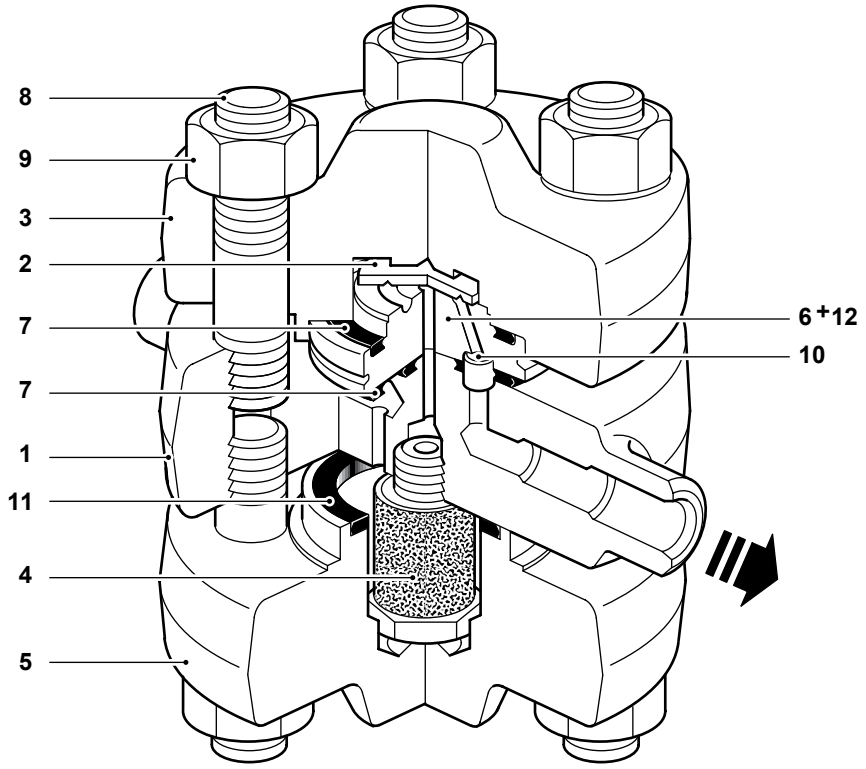
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.



Sizes and pipe connections

½", ¾" and 1" Butt weld ends to suit Schedule 160 pipe.
½", ¾" and 1" Socket weld ends to ASME (ANSI) B 16.11 Class 6000.
DN15 and DN25 standard integral flange EN 1092 PN160 and PN250.
DN15, DN20 and DN25 standard integral flanges: EN 1092 PN100, ASME (ANSI) Class 600, 900 and 1500.

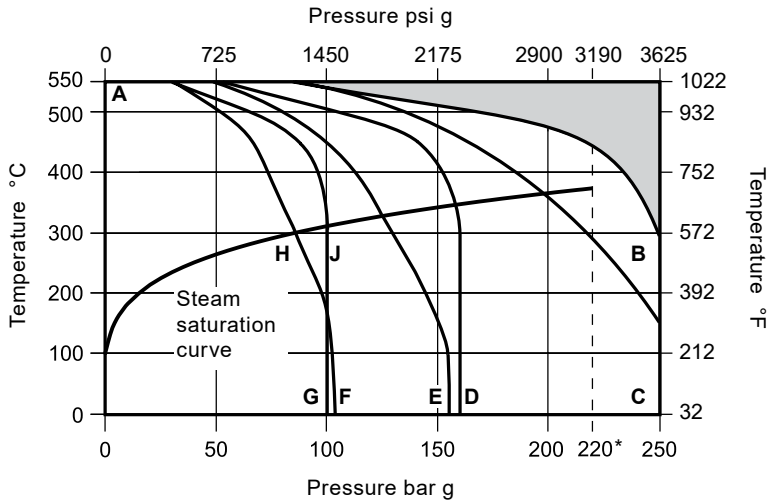
Materials



No.	Part	Material	
1	Body	Alloy steel	ASTM A182 F22
2	Disc	Steel	BS EN ISO 4957
3	Top cover	Alloy steel	ASTM A182 F22
4	Strainer screen assembly	Stainless steel	BS 970 304 S15/Sintered stainless
5	Bottom cover	Alloy steel	ASTM A182 F22
6 *	Seat	Steel	BS 4659 Gr. BD2
7	Cover gasket	Spirally wound stainless steel with exfoliated graphite filler	
8	Cover studs	Steel	ASTM A193 Gr. B16
9	Cover nuts	Steel	ASTM A194 Gr.4
10	Inner seat gasket	Spirally wound stainless steel with exfoliated graphite filler	
11	Cover gasket	Spirally wound stainless steel with exfoliated graphite filler	
12 *	Ferrule	Stainless steel	

*** Note:** Item 12 (ferrule) is pressed into item 6 (seat).

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

A-B Flanged to EN 1092 PN250, socket weld and butt weld ends.

A-C Flanged to ASME (ANSI) Class 1500.

A-D Flanged to EN 1092 PN160.

A -E Flanged to ASME (ANSI) Class 900.

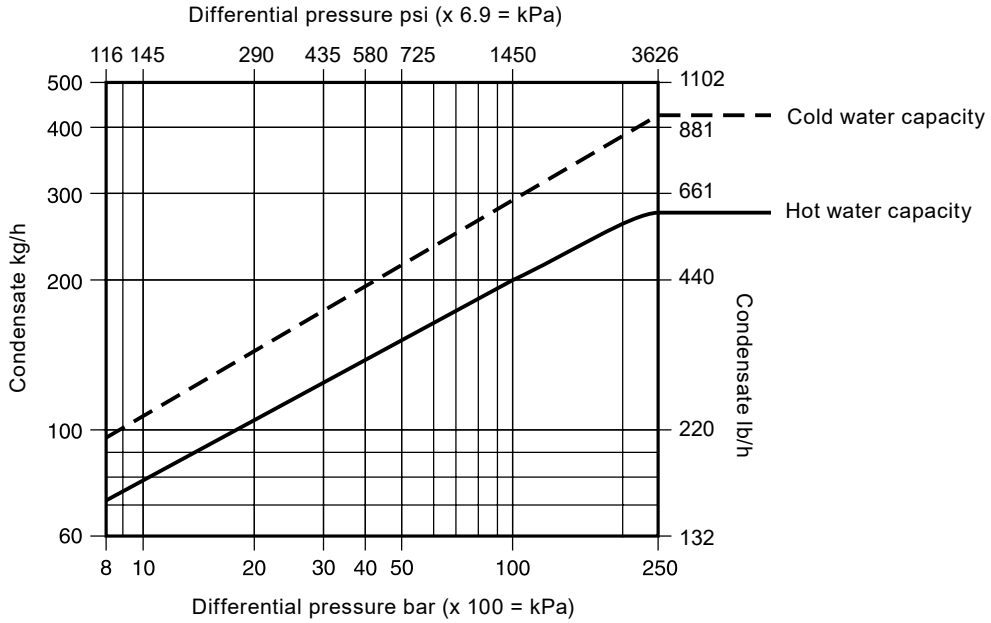
A-H-F Flanged to ASME (ANSI) Class 600.

A-J-G Flanged to EN 1092 PN100.

Note: If the product is used at pressures above 170 bar g (2466 psi g) we would recommend regular inspection of the seat.

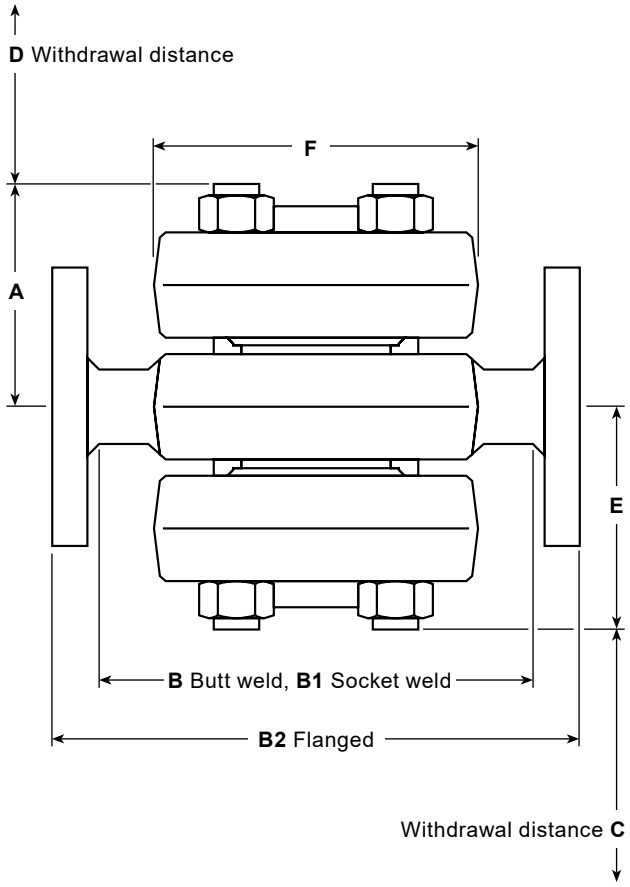
Body design conditions			PN250
PMA	Maximum allowable pressure	250 bar g @ 300 °C	3625 psi g @ 572 °F
TMA	Maximum allowable temperature	550 °C @ 80 bar g	1022 °F @ 1160 psi g
Minimum allowable temperature		-29 °C	-20.2 °F
PMO *	Maximum operating pressure for saturated steam service	220 bar g @ 374 °C	3190 psi g @ 705 °F
TMO	Maximum operating temperature	550 °C @ 80 bar g	1022 °F @ 1160 psi g
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco		0 °C	32 °F
PMOB	Maximum operating backpressure should not exceed 50% of the upstream pressure		
Minimum operating differential pressure		8 bar g	116 psi g
Product is safe for use under full vacuum conditions			
Designed for a maximum cold hydraulic test pressure of:		375 bar g	2438 psi g

Capacities (in accordance with ISO 7842)



pressure		cold water kg/h (lb/h)	Hot condensate kg/h (lb/h)	pressure		cold water kg/h (lb/h)	Hot condensate kg/h (lb/h)
bar g	psi g			bar g	psi g		
8	116	98 (217)	71 (156)	138	2000	329 (725)	221 (487)
17	250	136 (300)	96 (212)	155	2250	346 (762)	231 (510)
34	500	183 (403)	127 (280)	172	2500	361 (796)	241 (532)
52	750	217 (478)	149 (329)	190	2750	376 (829)	251 (553)
69	1000	245 (540)	167 (369)	207	3000	390 (860)	259 (572)
86	1250	269 (594)	183 (404)	224	3250	404 (890)	268 (591)
103	1500	291 (641)	197 (434)	241	3500	416 (918)	276 (608)
121	1750	311 (685)	209 (461)	250	3625	423 (932)	280 (617)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Flanged PN100

Size	A	B2	C	D	E	F	Weight
DN15	80 (3.2)	210 (8.2)	56 (2.2)	56 (2.2)	80 (3.2)	117 (4.6)	17.8 (39.2)
DN20		240 (9.4)					18.7 (41.2)
DN25		260 (10.2)					21.7 (47.8)

Flanged PN160

Size	A	B2	C	D	E	F	Weight
DN15	80 (3.2)	210 (8.2)	56 (2.2)	56 (2.2)	80 (3.2)	117 (4.6)	17.8 (39.2)
DN25		260 (10.2)					21.7 (47.8)

Flanged PN250

Size	A	B2	C	D	E	F	Weight
DN15	80 (3.2)	240 (9.4)	56 (2.2)	56 (2.2)	80 (3.2)	117 (4.6)	17.8 (39.2)
DN25							21.7 (47.8)

Butt weld and socket weld

Size	A	B	B1	C	D	E	F	Weight
½"	78 (3.1)	157 (6.2)	156 (6.1)	56 (2.2)	56 (2.2)	78 (3.1)	117 (4.6)	10.5 (23.1)
¾"	80 (3.2)							
1"			170 (6.6)					

Flanged ASME (ANSI) Class 600

Size	A	B2	C	D	E	F	Weight
½"	80 (3.2)	210 (8.2)	56 (2.2)	56 (2.2)	80 (3.2)	117 (4.6)	17.8 (39.2)
¾"		240 (9.4)					18.7 (41.2)
1"		260 (10.2)					21.7 (47.8)

Flanged ASME (ANSI) Class 900 and 1500

Size	A	B2	C	D	E	F	Weight
½"	80 (3.2)	240 (9.4)	56 (2.2)	56 (2.2)	80 (3.2)	117 (4.6)	17.8 (39.2)
¾"							18.7 (41.2)
1"		260 (10.2)					21.7 (47.8)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P150-12) supplied with the product.

Installation

The TD120M is designed for installation with the name-plate on top.
For ease and maintenance, consideration should be given to fitting isolation valves upstream and downstream of the steam trap.

Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

How to order

Example: 1 off Spirax Sarco ½" TD120M high pressure thermodynamic steam trap having an alloy steel body with integral strainer and butt weld connections, suitable for superheated steam main drainage. Seat and disc shall be maintainable.

Spare parts

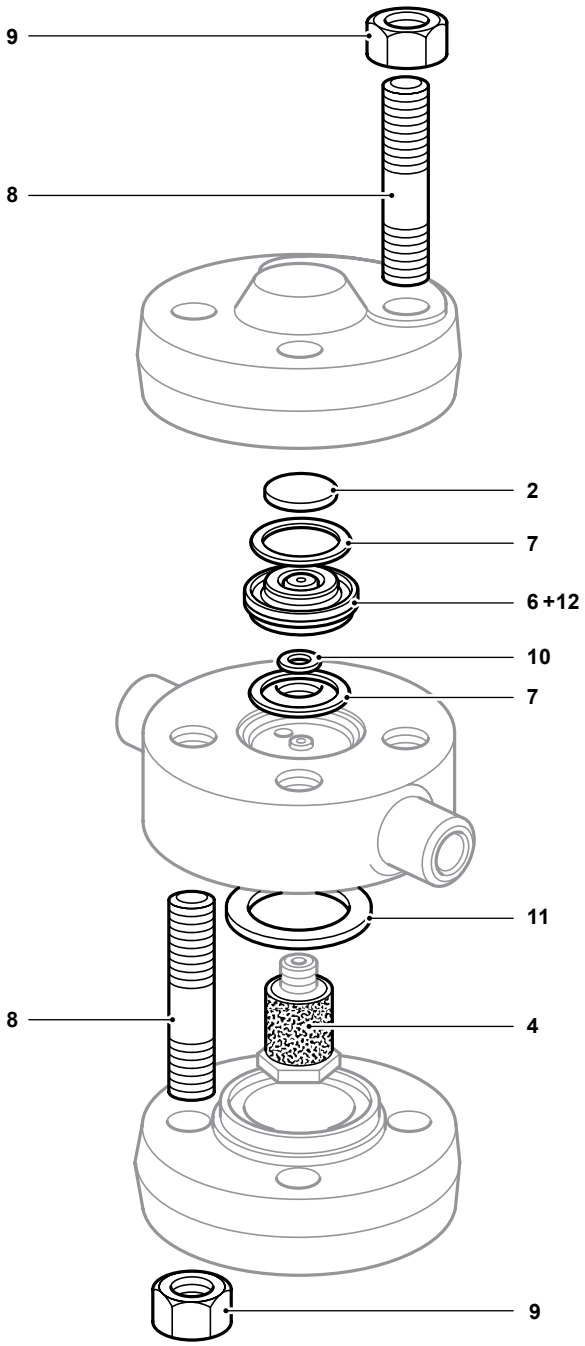
The spare parts available are shown in solid outline.
Parts drawn in a grey line are not supplied as spares.

Available spares

Set of cover studs and nuts	**8 (8 off), 9 (8 off)**
Strainer screen and gasket	**4, 11**
Set of gaskets	**7 (2 off), 10, 11**
Maintenance kit	**2, 4, 7 (2 off), 10, 11, 6 +12**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.
Example: 1 - Seat and disc assembly for a Spirax Sarco ½" TD120M high pressure thermodynamic steam trap.



Recommended tightening torques

Item	Part	or mm		N m	ft lbf
4		22 A/F		25 - 35	18 - 26
8	Stud		M16	85 - 90	63 - 66
9	Nut	23 A/F	M16	160 - 180	118 - 133

TI-P021-03-US
Issue 1

Cast Iron Float and Thermostatic Steam Traps FT-15, FT-30, FT-75, FT-125

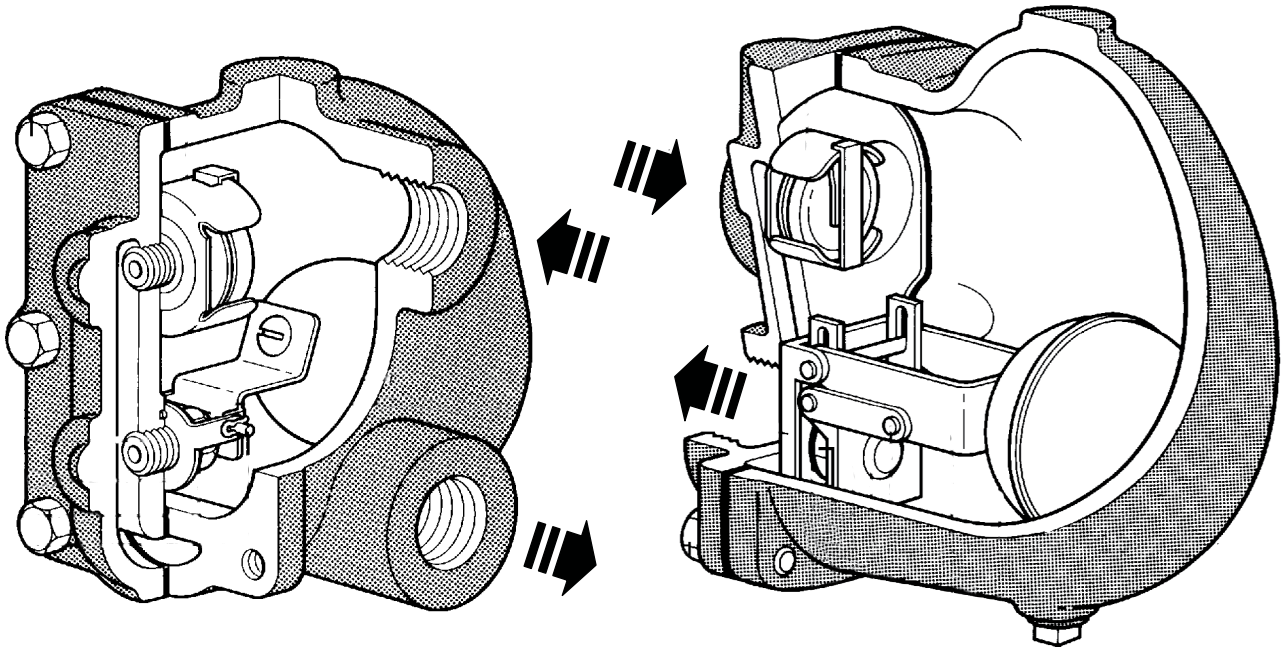
Description

The trap contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature, while non-condensible gases are released by a separate internal balanced pressure thermostatic air vent.

Model	FT-15	FT-30	FT-75	FT-125
PMO	15 psi g (1.0 bar g)	30 psi g (2.1 bar g)	75 psi g (5.2 bar g)	125 psi g (8.6 bar g)
Sizes	¾", 1", 1¼", 1½", 2"			
Connections	NPT			
Construction	Cast Iron Body and Cover, Stainless Steel Internals			
Options	Gauge Glass, Vacuum Breaker			

Typical applications

All process equipment, particularly when controlled by modulating temperature control valves; unit heaters, air heating coils, heat exchangers and steam main drip stations.



**All ¾", 1"
1¼" FT-15, FT-30**

**All 1½", 2"
1¼" FT-75, FT-125**

Capacities

See TI-P038-07-US

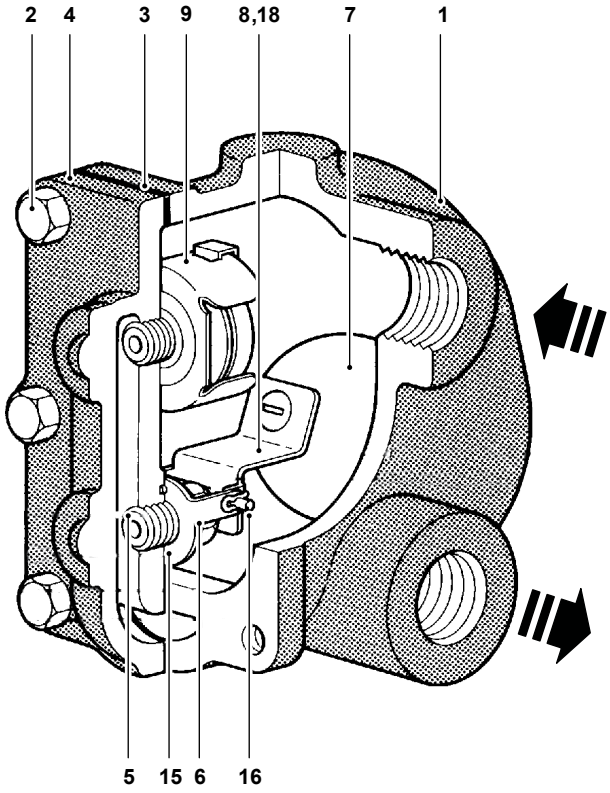
Limiting operating conditions

PMO	Maximum Operating Pressure	FT-15:	15 psi g	(1.0 bar g)
		FT-30:	30 psi g	(2.1 bar g)
		FT-75:	75 psi g	(5.2 bar g)
		FT-125:	125 psi g	(8.6 bar g)
Maximum Operating Temperature at all operating pressures			450 °F	(232 °C)

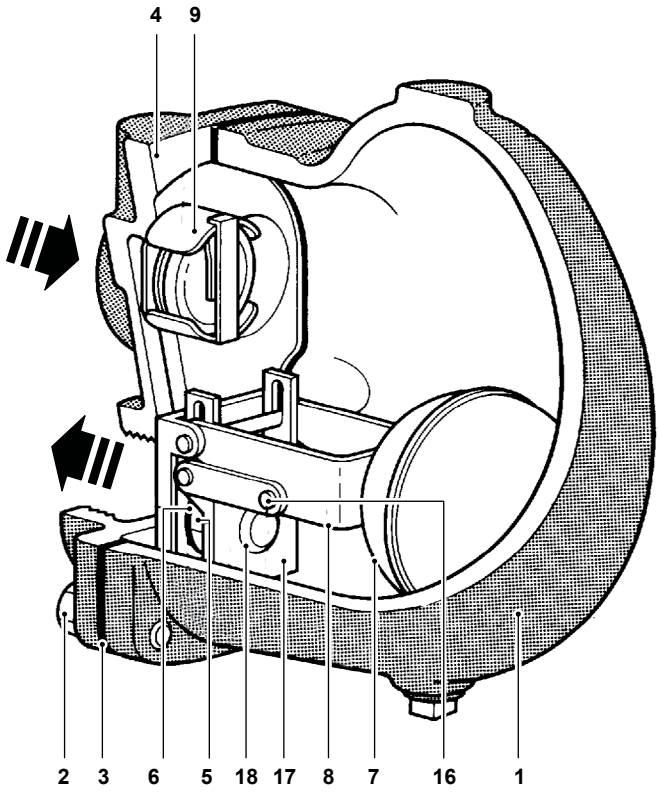
Pressure shell design conditions

PMA	Maximum allowable pressure	125 psi g @ 450 °F	(9 bar g @ 232 °C)
TMA	Maximum allowable temperature	450 °F @ 125 psi g	(232 °C @ 9 bar g)

Materials



All ¾", 1"
1¼" FT-15, FT-30

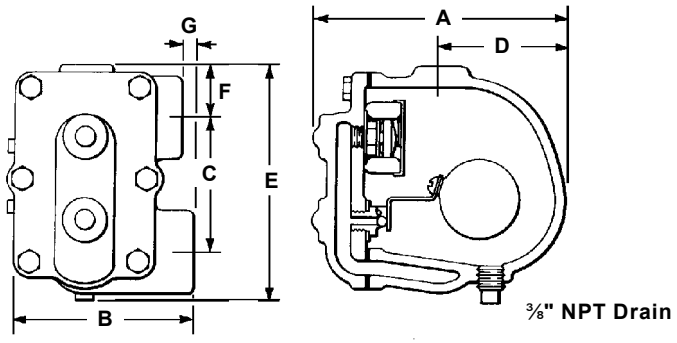


All 1½", 2"
1¼" FT-75, FT-125

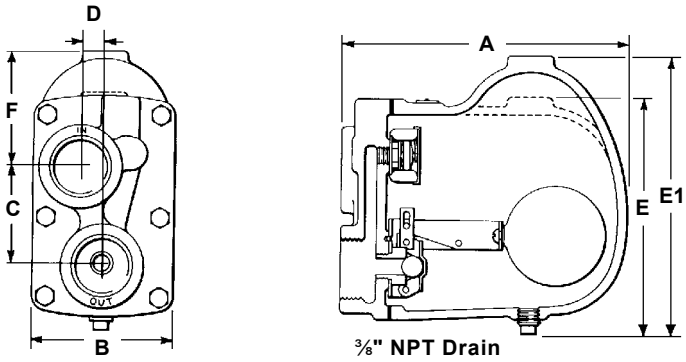
No.	Part	Material	
1	Body	Cast Iron	ASTM A126 CL B
2	Cover Screws	Carbon steel	ASTM A449
3	Cover Gasket	Graphite	
4	Cover	Cast Iron	ASTM A126 CL B
5	Valve Seat	Stainless steel	
6	Valve Seat Gasket	Stainless steel	
7	Ball Float	Stainless steel	
8	Float Arm	Stainless steel	
9	Air Vent Assembly	Stainless steel	
	Air Vent Head	Stainless steel	
	Air Vent Seat	Stainless steel	
15	Seat Bracket	Stainless steel	
16	Pivot Pins	Stainless steel	
17	Head Bracket, Stop, Link	Stainless steel	
18	Valve Head	Stainless steel	

Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)

**All ¾", 1"
1-¼" FT-15, FT-30**



**All 1-½", 2"
1-¼" FT-75, FT-125**



Size	A	B	C	D	E	E1	F	G	Weight
¾", 1"	6.2 (157)	4.6 (117)	3.3 (84)	3 (76)	5.75 (146)		1.3 (33)	0.3 (7.6)	9 lb (4.1 kg)
1¼"* 1½"	8.5 (216)	4.25 (108)	3 (76)	0.7 (18)		8.4 (213)	3.5 (89)		18 lb (8.2 kg)
2"	9.8 (249)	4.9 (124)	4.9 (124)	0.12 (3)	9.1 (231)		1.9 (48)		26 lb (11.8 kg)
*1-¼" (FT-15, FT-30	6.2 (157)	4.7 (119)	3 (76)	2.8 (71)	5.75 (146)		1.5 (38)	0.3 (7.6)	9.3 lb (4.2 kg)

Sample specification

Steam traps shall be of the mechanical ball float type having cast iron bodies, NPT connections, and all stainless steel internals. Incorporated into the trap body shall be a stainless steel balanced pressure thermostatic air vent capable of withstanding up to 450 °F (232 °C) and resisting waterhammer without sustaining damage. Internals of the trap shall be completely servicable without disturbing the piping.

Installation

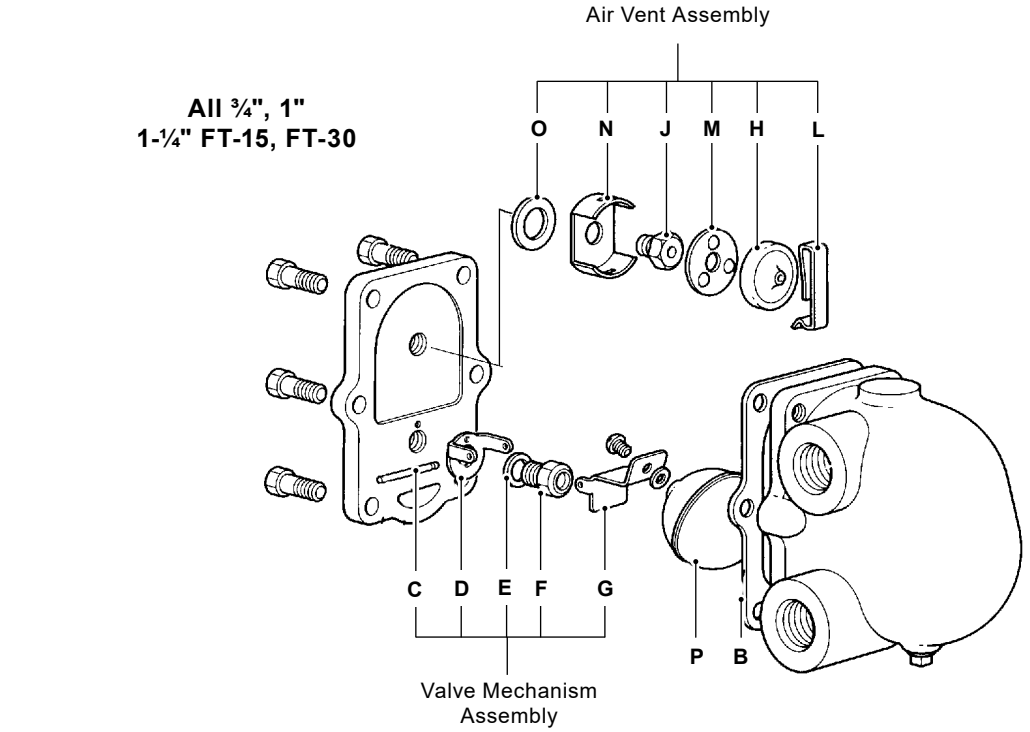
A pipeline strainer should be installed ahead of any steam trap. Full port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap, in a position so that the float arm is in a horizontal plane so that the float rises and falls vertically, and with the direction of flow as indicated on the body. Refer to IM-2-300 for complete instructions.

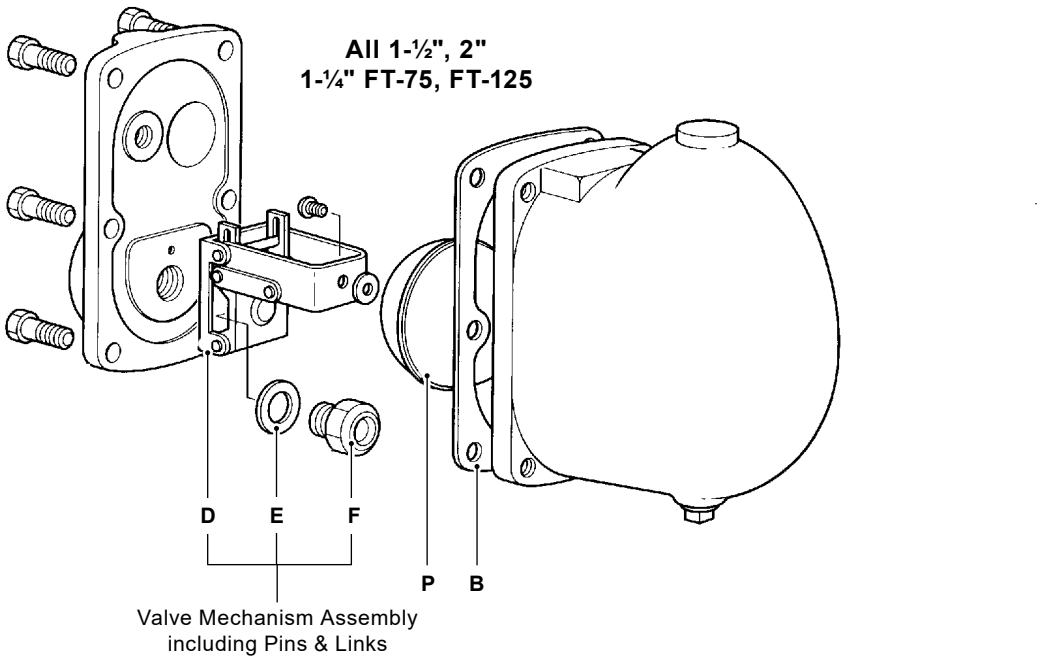
Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, operating mechanism and air vent.
Worn or damaged parts should be replaced using a complete valve mechanism assembly and/or air vent assembly.
Complete installation and maintenance instructions are given in IM-2-300, which accompanies the product.

Spare parts

Gasket Kit (3 of each)	**B, E**
Air Vent Kit	**H, J, L, M, N, O**
Valve Mechanism Kit (less float)	**C, D, E, F, (G)**
Float Kit	**P**
Replacement Module ¾", 1", 1¼" FT-15 ¾", 1", 1¼" FT-30 ¾", 1", FT-15, FT-125	Consists of: Air Vent Assembly and Valve Mechanism (w/Float) attached to a Cover and supplied with a Cover Gasket, Nameplate and a set of Cover Bolts. (Assembled)





TI-P038-08-US
Issue 1

Cast Iron Float and Thermostatic Steam Traps FT-150, FT-200

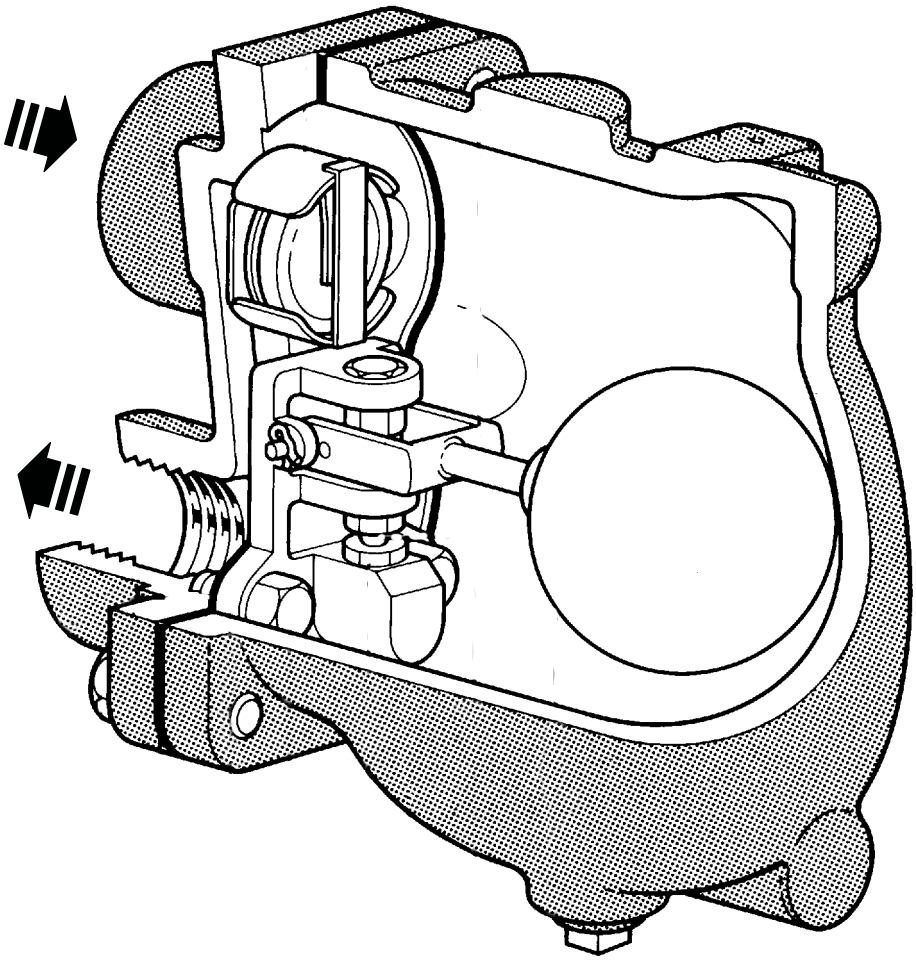
Description

The trap contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature, while non-condensible gases are released by a separate internal balanced pressure thermostatic air vent.

Model	FT-150	FT-200
PMO	150 psi g	200 psi g
Sizes	¾", 1", 1-¼", 1-½"	
Connections	NPT	
Construction	Cast Iron Body and Cover, Stainless Steel Internals	
Option	Gauge Glass Vacuum Breaker	

Typical applications

All process equipment, particularly when controlled by modulating temperature control valves, unit heaters, air heating coils, heat exchangers and steam main drip stations.



Limiting operating conditions

PMO	Maximum Operating Pressure	FT-150:	150 psi g (10.3 bar g)
		FT-200:	200 psi g (13.8 bar g)
Maximum Operating Temperature at all operating pressures			450 °F (232 °C)

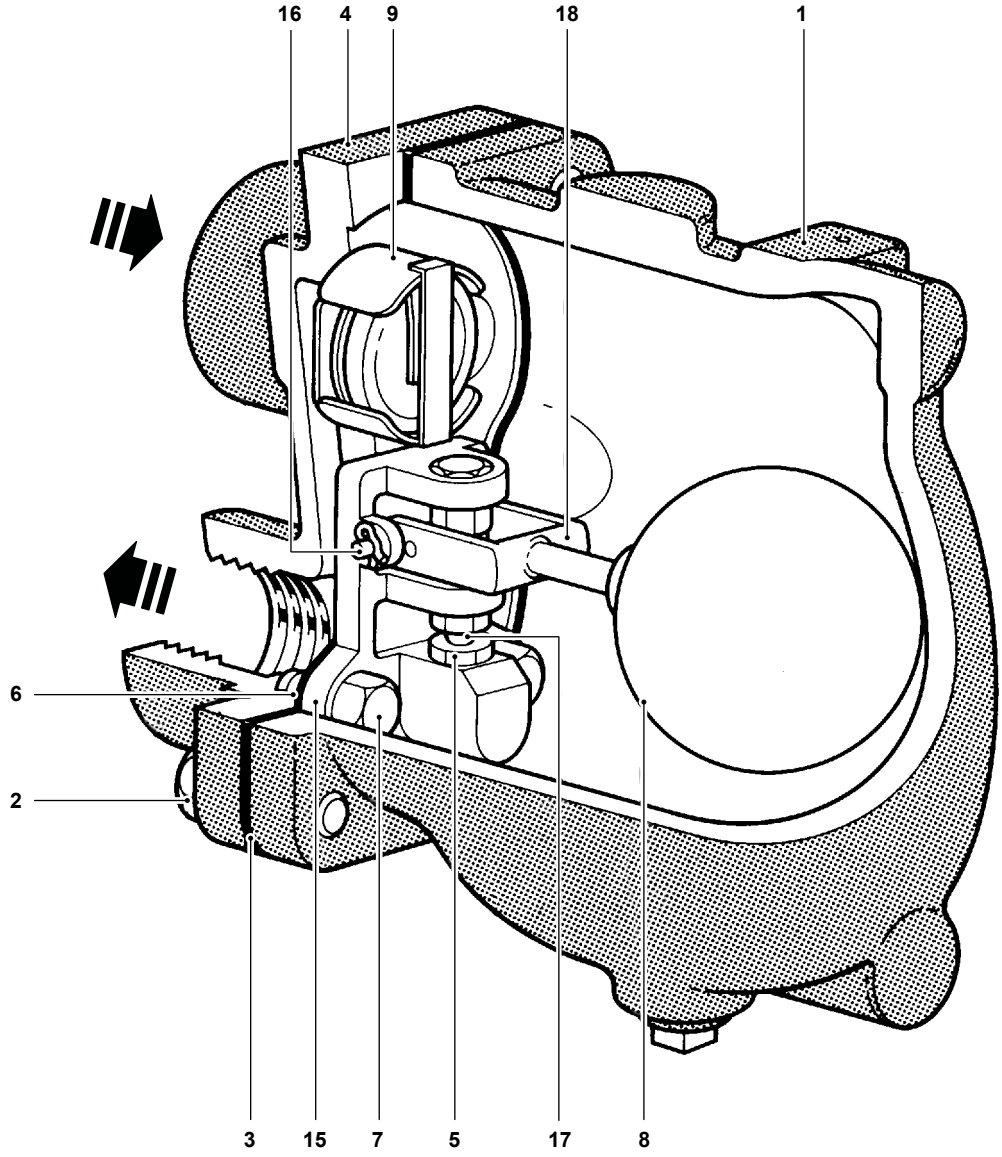
Pressure shell design conditions

PMA	Maximum allowable pressure	200 psi g @ up to 450 °F (13.8 bar g @ up to 232 °C)
TMA	Maximum allowable temperature	450 °F @ 200 psi g (232 °C @ 13.8 bar g)

Capacities

See TI-P038-07-US.

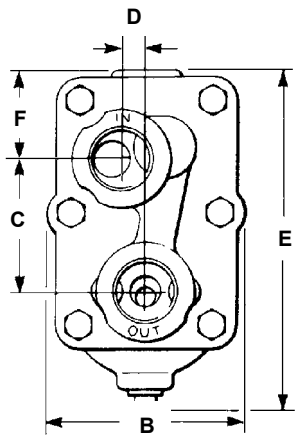
Materials

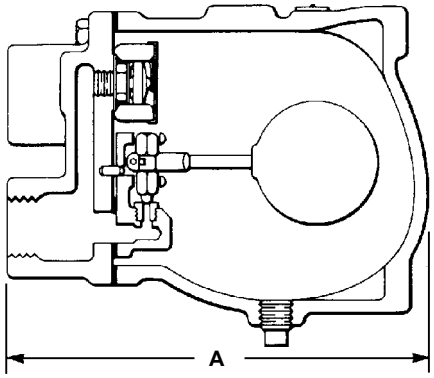


No.	Part	Material	
1	Body	Cast Iron	ASTM A126 CL B
2	Cover screws	Carbon Steel	ASTM A449
3	Cover gasket	Graphite	
4	Cover	Cast Iron	ASTM A126 CL B
5	Valve seat	Stainless Steel	
6	Main valve assembly gasket	Graphite	
7	Main valve assembly Screws	Copper Alloy	
8	Ball float	Stainless Steel	

No.	Part	Material
9	Air vent assembly	Stainless Steel
	Air vent head	Stainless Steel
	Air vent seat	Stainless Steel
15	Main valve assembly housing	Cast Red Brass
16	Pivot pin	Stainless Steel
17	Valve head	Stainless Steel
18	Float arm	Forged Brass (¾", 1")
		Cast Red Brass (1-¼", 1-½")

Dimensions/weights (approximate) in inches (mm) and lbs (kg)





Size	A	B	C	D	E	F	Weight
¾", 1"	8.5 (216)	3.9 (99)	2.6 (66)	0.4 (10)	6.9 (175)	1.8 (46)	15 lb (6.8 kg)
1¼", 1½"	10.75 (273)	5.75 (146)	3 (76)	0.6 (15)	9.1 (231)	2.5 (64)	30 lb (13.6 kg)

Sample specification

Steam traps shall be of the mechanical ball float type having cast iron bodies, NPT connections, and stainless steel valve heads and seats. Incorporated into the trap body shall be a stainless steel balanced pressure thermostatic air vent capable of withstanding 450 °F (232 °C) steam temperature and resisting waterhammer without sustaining damage. Internals of the trap shall be completely servicable without disturbing the piping.

Installation

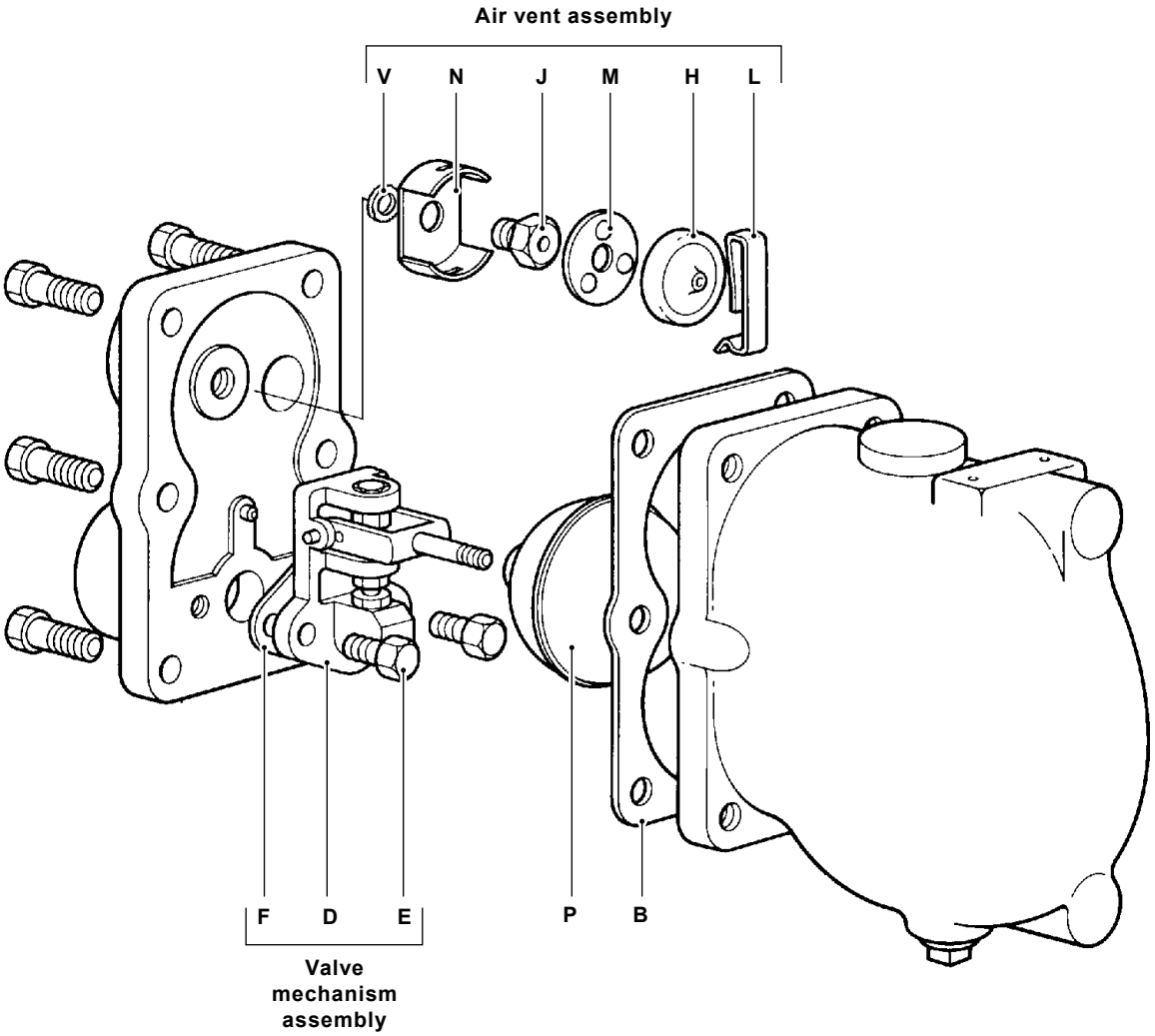
A pipeline strainer should be installed ahead of any steam trap. Full port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap, in a position so that the float arm is in a horizontal plane and the float rises and falls vertically, with the flow direction as indicated on the cover. Refer to IMI 2.300 for complete instructions.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, operating mechanism and air vent. Worn or damaged parts should be replaced using a complete valve mechanism assembly and/or air vent assembly.
Complete installation and maintenance instructions are given in IMI 2.300, which accompanies the product.

Spare Parts

Gasket Kit (3 of each)	B, F
Air Vent Kit	H, J, L, M, N
Valve Mechanism Kit (less float)	D, E, F
Float Kit	P



TI-P021-02-US
Issue 1

Cast Iron Float and Thermostatic Steam Traps FTI-15, FTI-30, FTI-75, FTI-125, FTI-200

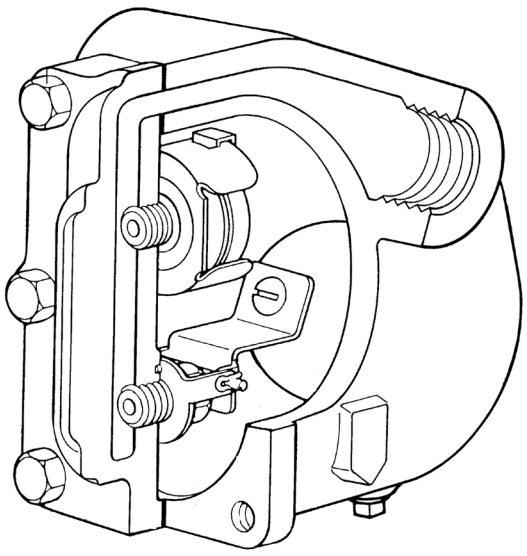
Description

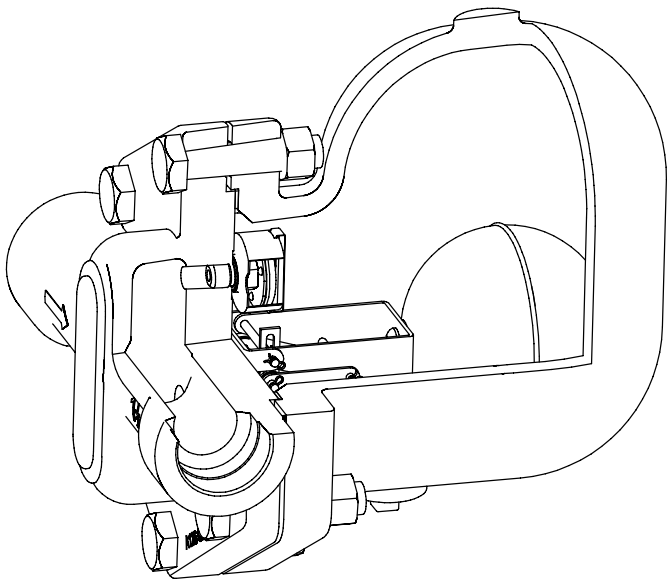
The Spirax Sarco FTI contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature while non-condensible gases are released by a separate internal balanced pressure thermostatic air vent. The in-line piping connections simplify installation.

Model	FTI-15	FTI-30	FTI-75	FTI-125	FTI-200
PMO	15 psi g (1.0 bar g)	30 psi g (2.1 bar g)	75 psi g (5.2 bar g)	125 psi g (8.6 bar g)	200 psi g (13.8 bar g)
Sizes	½", ¾", 1", 1-½"				
Connections	NPT				
Construction	Cast Iron Body and Cover, Stainless Steel Internals				
Options	Gauge Glass, Vacuum Breaker				

Typical applications

Air heating coils, heat exchangers,steam main drip stations; small process equipment, particularly when controlled by a modulating temperature control valve; replacement of less efficient inverted bucket traps on unit heating equipment.





Limiting operating conditions

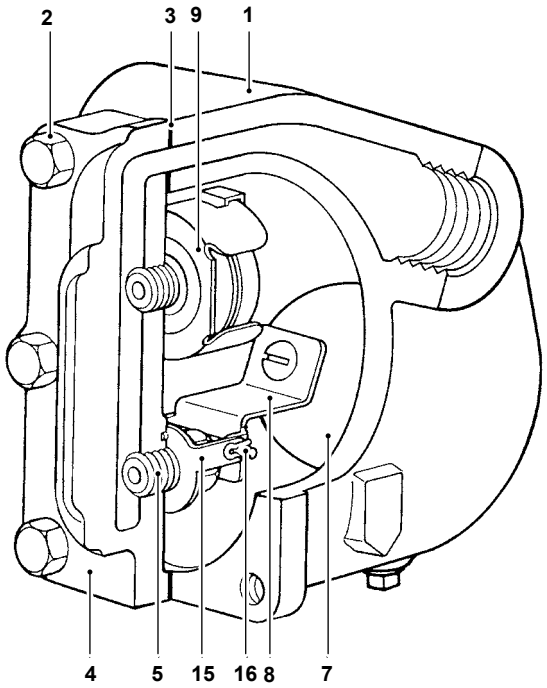
PMO	Maximum operating pressure	FTI-15:	15 psi g	(1.0 bar g)
		FTI-30:	30 psi g	(2.1 bar g)
		FTI-75:	75 psi g	(5.2 bar g)
		FTI-125:	125 psi g	(8.6 bar g)
		FTI-200:	200 psi g	(13.8 bar g)
Maximum operating temperature all operating pressures			450 °F	(232 °C)

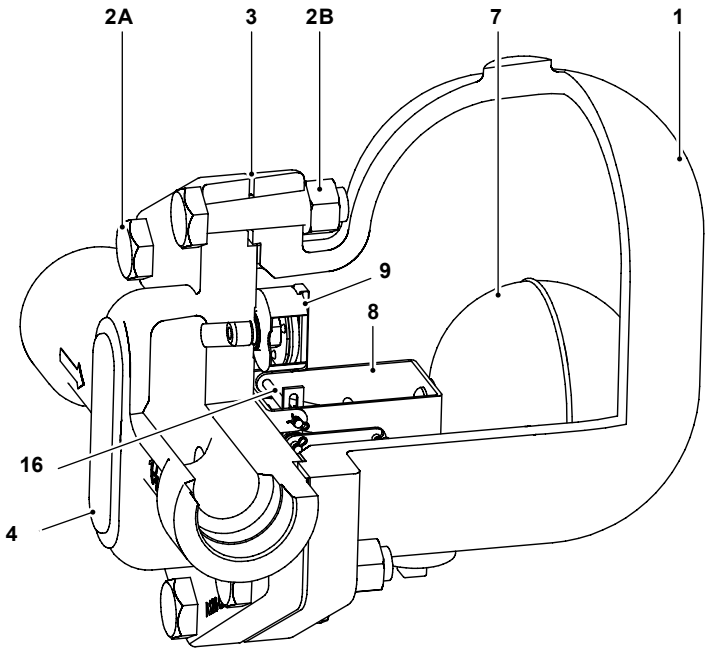
Pressure shell design conditions

PMA	Maximum allowable pressure	200 psi g @ up to 450 °F	(13.8 bar g @ up to 232 °C)
TMA	Maximum allowable temperature	450 °F @ up to 200 psi g	(232 °C @ up to 13.8 bar g)

2.3
14

Materials

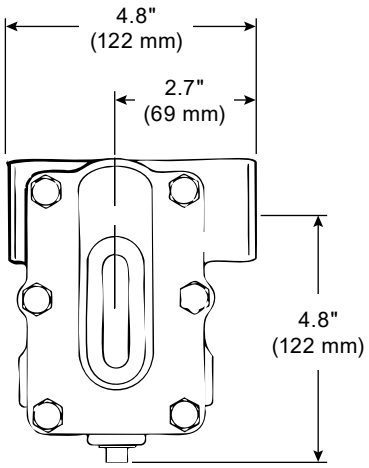


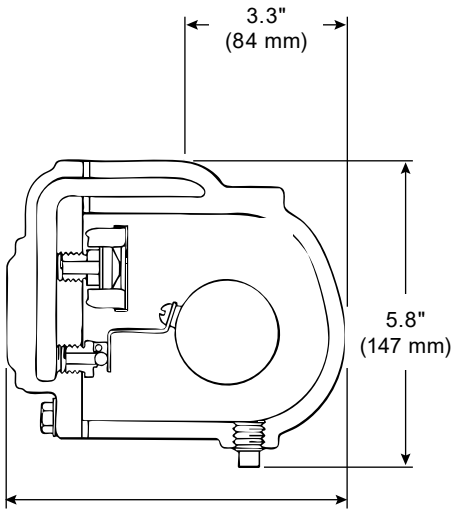


No.	Part	Material	
1	Body	Cast Iron	ASTM A126 CL B
2	Cover screws	Carbon Steel	ASTM A449
2A	Cover bolts	Alloy Steel	ASTM A 193 B7
2B	Cover nuts ¾" & 1"	7/16 - 14 UNC-2A	ASTM A 194 2H
3	Cover gasket	Graphite	
4	Cover	Cast Iron	ASTM A126 CL B

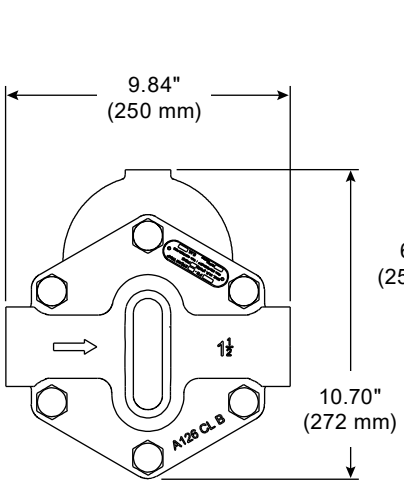
No.	Part	Material
5	Valve seat	Stainless steel
7	Ball float	Stainless steel
8	Float arm	Stainless steel
9	Air vent assembly	Stainless steel
	Air vent head	Stainless steel
	Air vent seat	Stainless steel
15	Seat bracket	Stainless steel
16	Pivot pins	Stainless steel
18	Valve head	Stainless steel

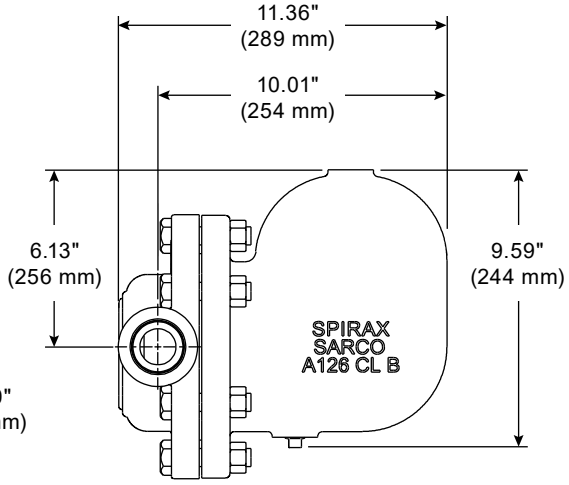
Dimensions/weights (approximate) in inches and lbs (kg)





Weight	
½", ¾" and 1" size	11.3 lb (5.1 kg)





Weight	
1½" size	52 lb (23.6 kg)

Sample specification

Steam traps shall be of the mechanical ball float type having cast iron bodies, NPT horizontal in-line connections, and all stainless steel internals. Incorporated into the trap body shall be a stainless steel balanced pressure thermostatic air vent capable of withstanding 450 °F (232 °C) and resisting waterhammer without sustaining damage. Internals of the trap shall be completely servicable without disturbing the piping.

Installation

A pipeline strainer should be installed ahead of any steam trap. Full-port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap, in a position so that the float arm is in a horizontal plane and the float rises and falls vertically with the flow direction as indicated on the body. Refer to the IMI which accompanies the product for complete instructions.

Maintenance

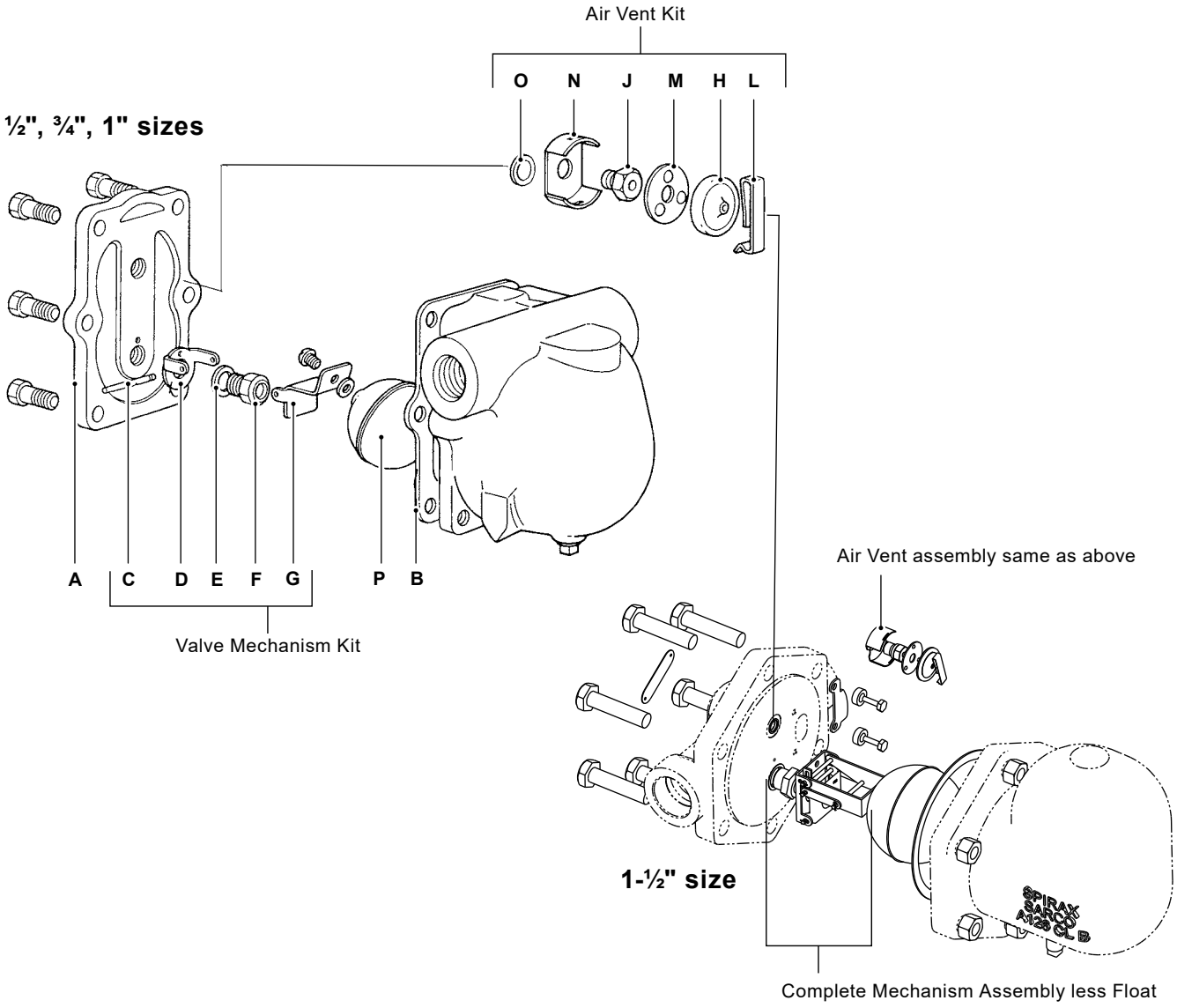
This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, operating mechanism and air vent. Worn or damaged parts should be replaced using a complete valve mechanism assembly and/or air vent assembly.
Complete installation and maintenance instructions are given in the IMI, which accompanies the product.

Spare Parts

Gasket Kit : Cover-Seat Gasket(3 of each)	**B, E**
Air Vent Kit	**H, J, L, M, N, O**
Complete Valve Mechanism Kit (less float)	**C, D, E, F, G**
Float Kit : Float, Washer, Screw	**P**

Replacement Module

Consists of: Air Vent Assembly and Valve Mechanism (w/Float) attached to a Cover and supplied with a Cover Gasket, Nameplate and a set of Cover Bolts.
½", ¾", 1" FTI 15, 30, 75, 125, 200



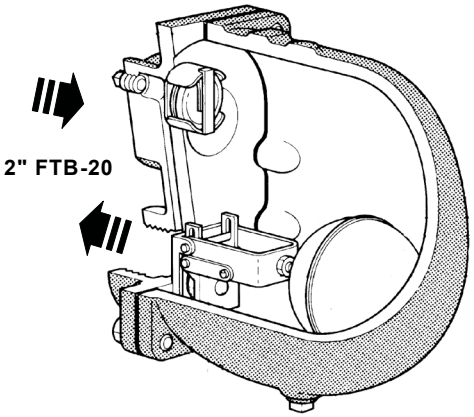
TI-P034-01-US
Issue 2

Cast Iron Float and Thermostatic Steam Traps
FTB Super Capacity Series

Description

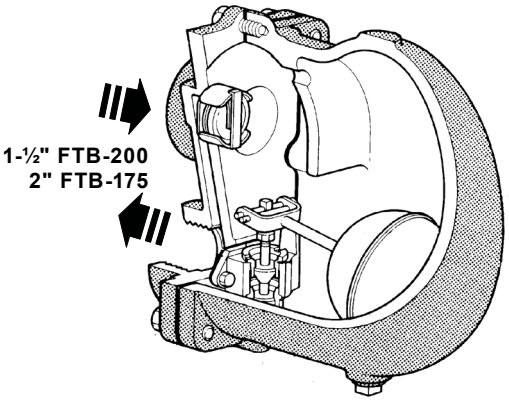
The trap contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature. Non-condensible gases are released by a separate internal balanced pressure thermostatic air vent.

Model	FTB-20	FTB-30	FTB-125	FTB-175	FTB-200
PMO	20 psi g	30 psi g	125 psi g	175 psi g	200 psi g
Sizes	2"	2"	1-½"	2", 2-½"	1-½"
Connections	NPT				
Construction	Cast iron body				
	Stainless steel internals				
Options	Gauge glass, vacuum breaker				



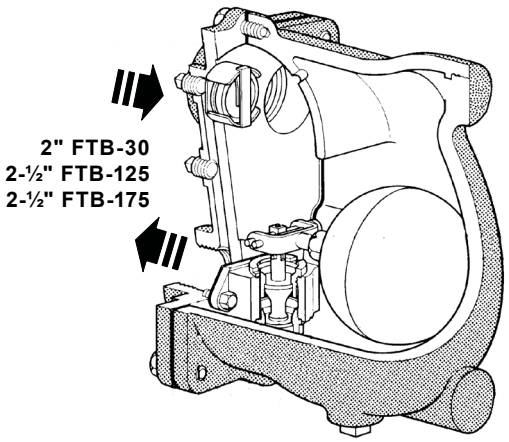
Limiting operating conditions

Maximum operating pressure (PMO)	FTB-20: 20 psi g	(1.4 bar g)
	FTB-30: 30 psi g	(2.1 bar g)
	FTB-125:125 psi g	(8.6 bar g)
	FTB-175:175 psi g	(12.1 bar g)
	FTB-200: 200 psi g	(14.0 bar g)
Maximum operating temperature	450 °F @ 200 psi g	(232 °C @ 14 bar g)



Pressure shell design conditions

PMA	Maximum allowable temperature	FTB-125	175 psi g/up to 450 °F (12.1 bar g/up to 232 °C)
		FTB-175	
		FTB-200	200 psi g/up to 450˚F (14 bar g/up to 232˚C)
		FTB-20	125 psi g/up to 450 °F (8.6 bar g/up to 232˚C)
		FTB-30	
TMA	Maximum allowable temperature	FTB-125	450 ° F/0-175 psi g (232 °C/0-12.1 bar g)
		FTB-175	
		FTB-20	
		FTB-30	450 ° F/0-125 psi g (232 °C/0-8.6 bar g)
		FTB-200	450 °F/0-200 psi g (232 °C/0-8.6 bar g)



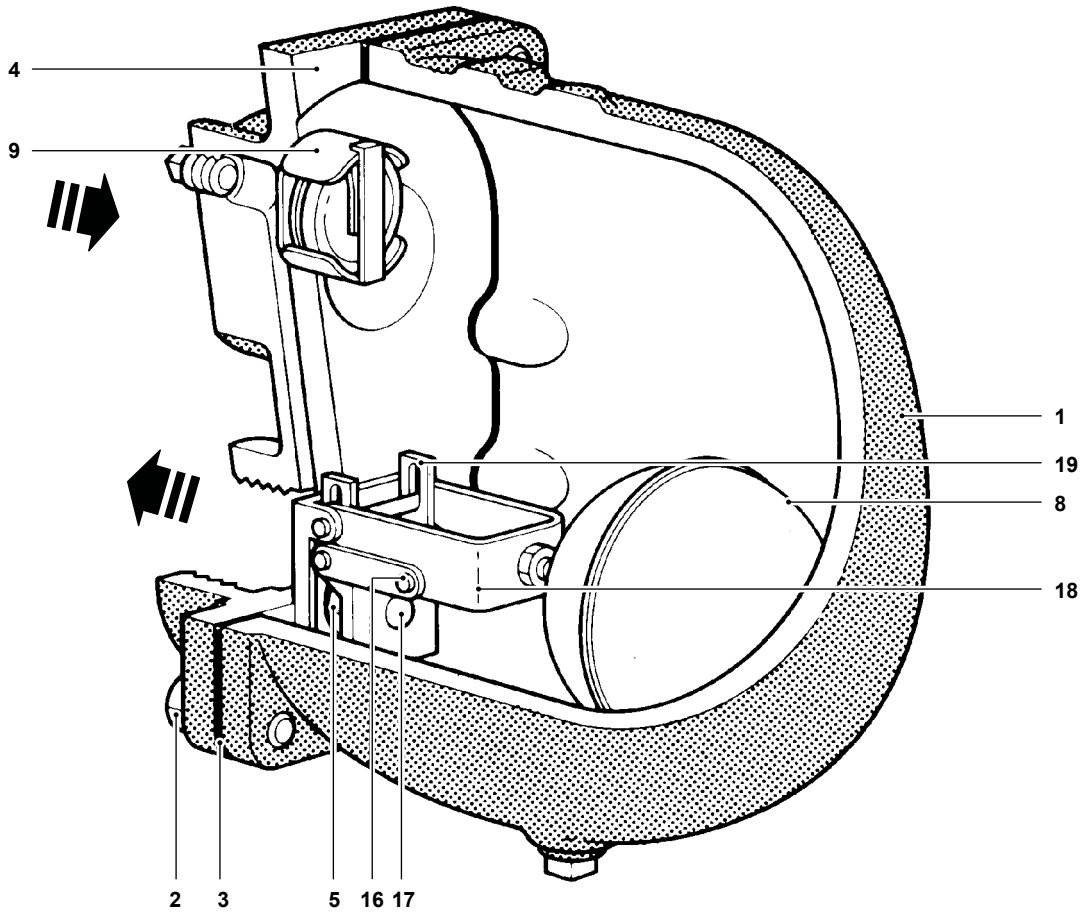
Typical applications

All process heat exchange equipment, particularly when controlled by modulating temperature control valves; unit heaters and air heating coils.

For capacities, see TI-2-317-US

Materials

2" FTB-20

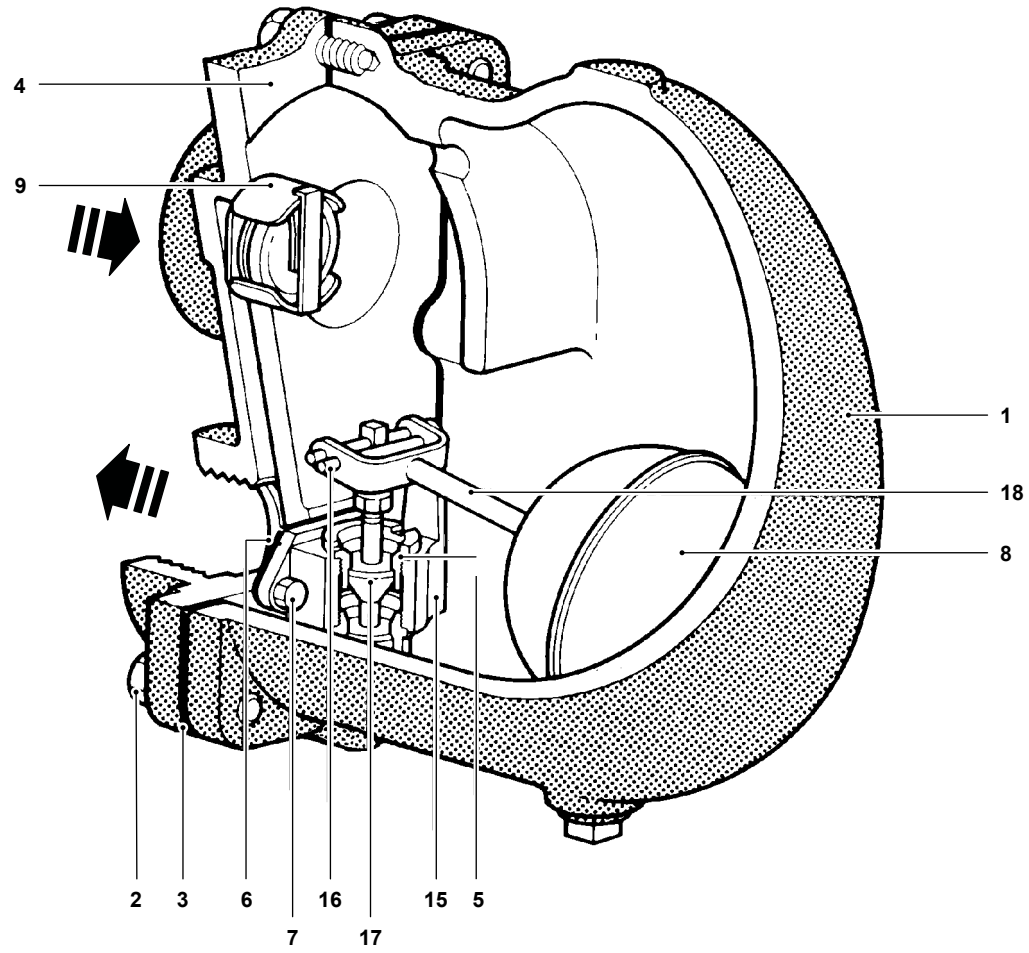


No.	Part	Material	
1	Body	Cast iron	ASTM A126 CL B
2	Cover screws	Carbon steel	ASTM A449 Type 1
3	Cover gasket	Graphite	
4	Cover	Cast iron	ASTM A126 CL B
5	Valve seat	Stainless steel	
8	Ball float	Stainless steel	

No.	Part	Material	
9	Air vent assembly	Stainless steel	
	Air vent head	Stainless steel	
	Air vent seat	Stainless steel	
16	Pivot pin	Stainless steel	
17	Valve head	Stainless steel	(FTB-20, 175, 200)
		Cast stainless steel	(FTB-30, 125, 200)
18	Float arm	Stainless steel	
19	Seat bracket, head bracket, stop, link	Stainless steel	(FTB-20)

Materials

1-½" FTB-200
2" FTB-175

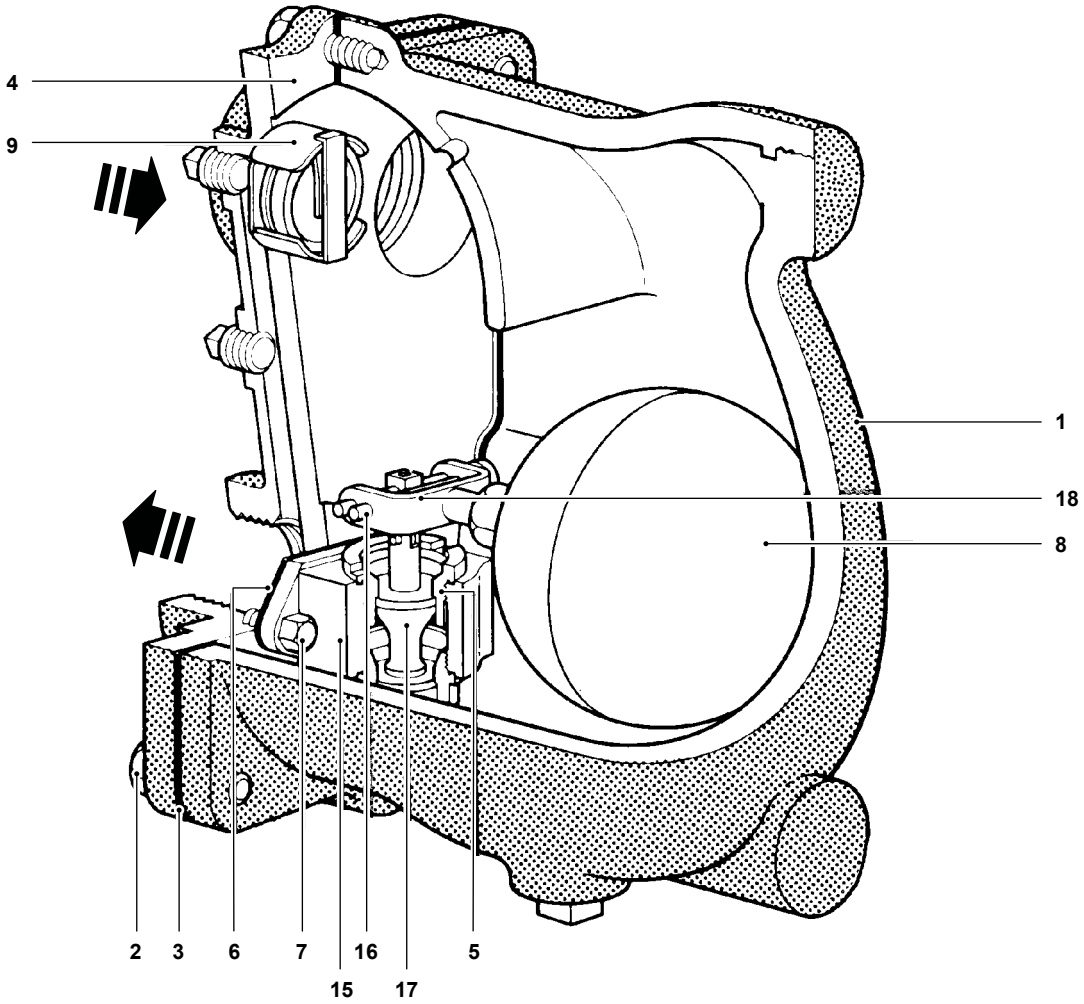


No.	Part	Material	
1	Body	Cast iron	ASTM A126 CL B
2	Cover screws	Carbon steel	ASTM A449 Type 1
3	Cover gasket	Graphite	
4	Cover	Cast iron	ASTM A126 CL B
5	Valve seat	Stainless steel	
6	Valve seat gasket	Stainless steel	(FTB-20)
	Valve assembly gasket	Graphite	
7	Main valve assembly screws	Stainless steel	ASTM A193 Grade B8
8	Ball float	Stainless steel	

No.	Part	Material	
9	Air vent assembly	Stainless steel	
	Air vent head	Stainless steel	
	Air vent seat	Stainless steel	
15	Main valve assembly housing	Stainless steel	
16	Pivot pin	Stainless steel	
17	Valve head	Stainless steel	(FTB-20, 175, 200)
		Cast stainless steel	(FTB-30, 125, 200)
18	Float arm	Stainless steel	

Materials

2" FTB-30
2-½" FTB-125
2-½" FTB-175



No.	Part	Material	
1	Body	Cast iron	ASTM A126 CL B
2	Cover screws	Carbon steel	ASTM A449 Type 1
3	Cover gasket	Graphite	
4	Cover	Cast iron	ASTM A126 CL B
5	Valve seat	Stainless steel	
6	Valve seat gasket	Stainless steel	(FTB-20)
	Valve assembly gasket	Graphite	
7	Main valve assembly screws	Stainless steel	ASTM A193 Grade B8
8	Ball float	Stainless steel	

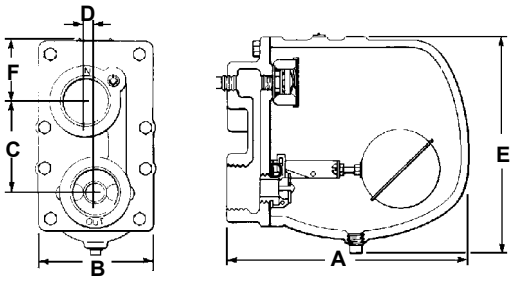
No.	Part	Material	
9	Air vent assembly	Stainless steel	
	Air vent head	Stainless steel	
	Air vent seat	Stainless steel	
15	Main valve assembly housing	Stainless steel	
16	Pivot pin	Stainless steel	
17	Valve head	Stainless steel	(FTB-20, 175, 200)
		Cast stainless steel	(FTB-30, 125, 200)
18	Float arm	Stainless steel	

Dimensions (nominal) in inches (millimeters) and lbs (kg)

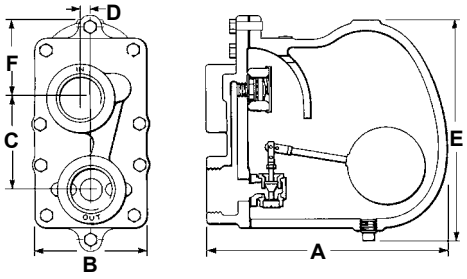
Type & Size	A	B	C	D
FTB-20 2"	12.2 (309)	5.9 (150)	4.5 (114)	0.5 (13)
FTB-30 2"	15.25 (387)	9.25 (235)	7.25 (184)	1.4 (35)
FTB-125 2-½"	15.6 (396)	9.25 (235)	7.25 (184)	1.4 (35)
FTB-175 2"	12.1 (307)	5.9 (150)	4.5 (114)	0.5 (13)
FTB-175 2-½"	15.4 (390)	9.25 (235)	7.25 (184)	1.4 (35)
FTB-200 1-½"	10.8 (274)	5.8 (147)	3 (76)	0.6 (14)

Type & Size	E	F	Weight
FTB-20 2"	10.7 (272)	3 (76)	43 lb (19.5 kg)
FTB-30 2"	15.6 (396)	3.75 (95)	89 lb (40.4 kg)
FTB-125 2-½"	15.6 (396)	3.75 (95)	90 lb (40.8 kg)
FTB-175 2"	11.8 (300)	4 (102)	48 lb (21.8 kg)
FTB-175 2-½"	15.6 (396)	3.75 (95)	90 lb (40.8 kg)
FTB-200 1-½"	9.1 (231)	2.3 (58)	31 lb (14.1 kg)

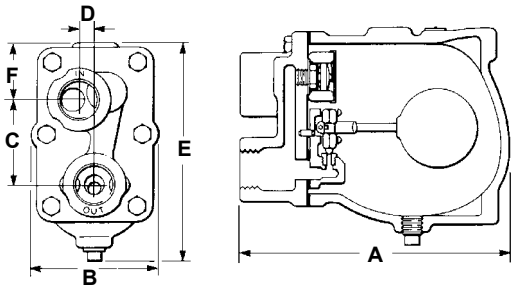
2" FTB-20



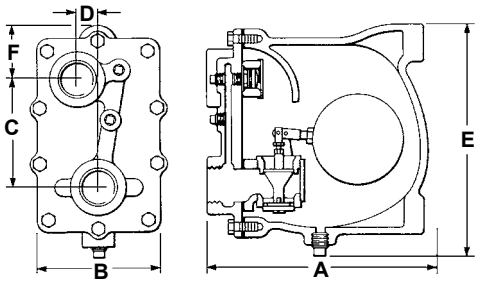
2"FTB-175



1-½" FTB-200



2" FTB-30, 2-½" FTB-125 & 175



Installation

A pipeline strainer should be installed ahead of any steam trap. Full-port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap, in a position with the float arm in a horizontal plane so that the float rises and falls vertically, and with the direction of flow as indicated on the cover. Refer to IM-2-300-US for complete instructions.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.

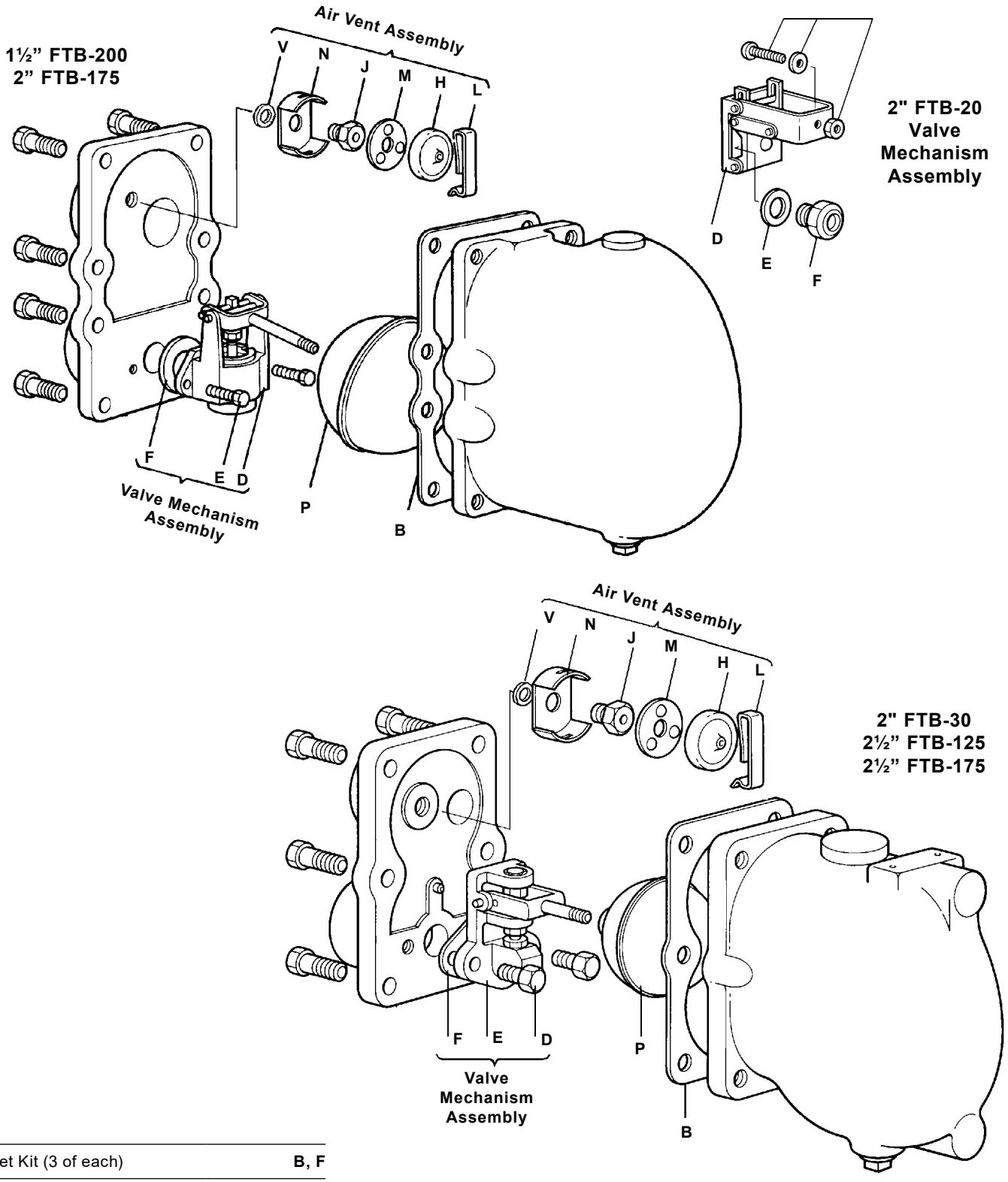
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, and operating mechanism. Worn or damaged parts should be replaced using a complete valve mechanism assembly and/or air vent assembly.

Complete installation and maintenance instructions are given in IM-2-300-US, which accompanies the product.

Sample specification

Steam traps shall be of the mechanical float type having Cast iron bodies, NPT connections, and Stainless steel valve heads and seats. Incorporated into the trap body shall be a Stainless steel balanced pressure thermostatic air vent capable of withstanding 450 ˚F and resisting waterhammer without sustaining damage. Internals of the trap shall be completely servicable without disturbing the piping.

Spare parts



Gasket Kit (3 of each)	**B, F**
Gastket Kit (3 of each) FTB-20	**B, F**
Air Vent Kit	**V, N, J, M, H, L**
Valve Mechanism Kit (less float)	**D, E, F**
Float	**P**

TI-P034-02-US
Issue 1

Cast Steel Float and Thermostatic Steam Traps
FTB Super Capacity Series

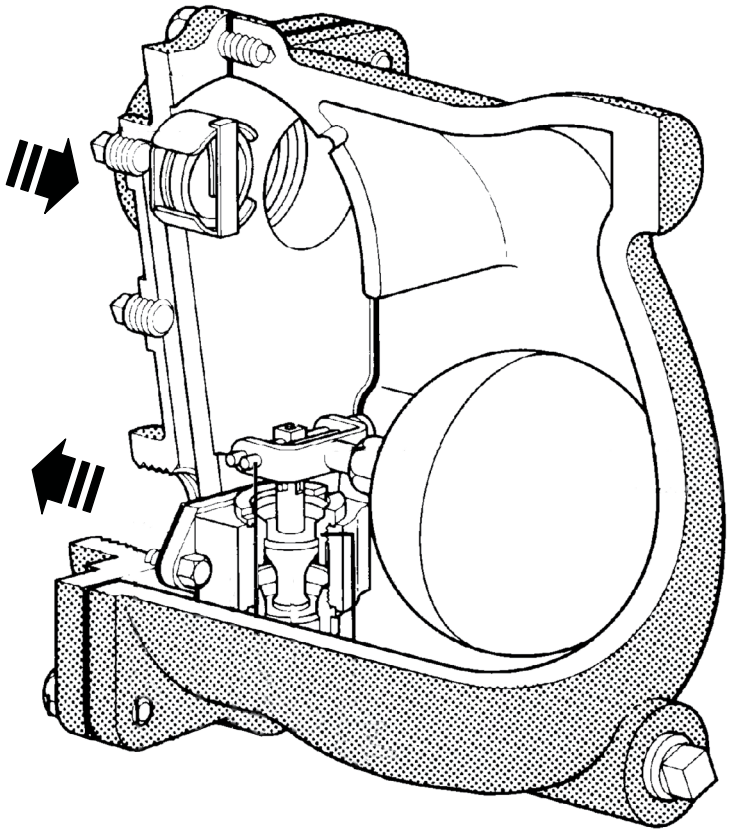
Description

The trap contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature. Non-condensible gases are released by a separate internal balanced pressure thermostatic air vent.

Model	FTB-125		FTB-200	
PMO	125 psi g	8.6 bar g	200 psi g	13.8 bar g
Sizes	2½"			
Connections	NPT, SW			
Construction	Cast steel body			
	Stainless Steel valve head and seat, mechanism housing			
Options	Bimetal Air Vent			

Typical applications

All process heat exchange equipment, particularly when controlled by modulating temperature control valves; unit heaters and air heating coils.



Limiting operating conditions

PMO	Maximum operating pressure	FTB-125:	125 psi g (8.6 bar g)
		FTB-200:	200 psi g (13.8 bar g)

Thermostatic air vent operating range

Steam pressure		Maximum steam temperature	
psi g	bar g	°F	°C
200	13.8	572	300
175	12.1	558	292
150	10.3	555	291
100	6.9	547	286
75	5.2	542	283
50	3.4	534	279
25	1.7	521	272
0	0	464	240

Note: Use bimetal air vent outside range on chart up to 650 °F (343 °C).

Pressure shell design conditions

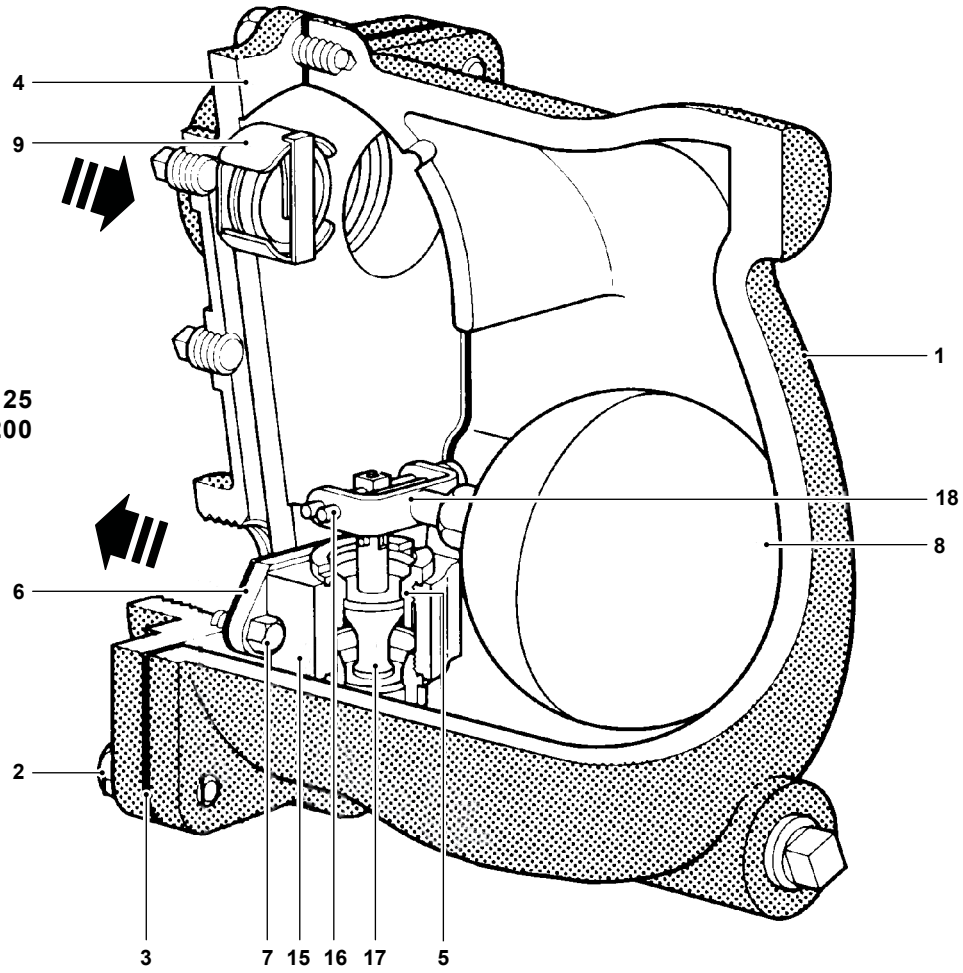
PMA	Maximum allowable pressure	FTB-125 FTB-200	200 psi g @ up to 650 °F (13.8 bar g @ up to 343 °C)
TMA	Maximum allowable temperature	FTB-125 FTB-200	650 °F @ 200 psi g (343 °C @ 13.8 bar g)

Capacities

See TI-P038-07-US

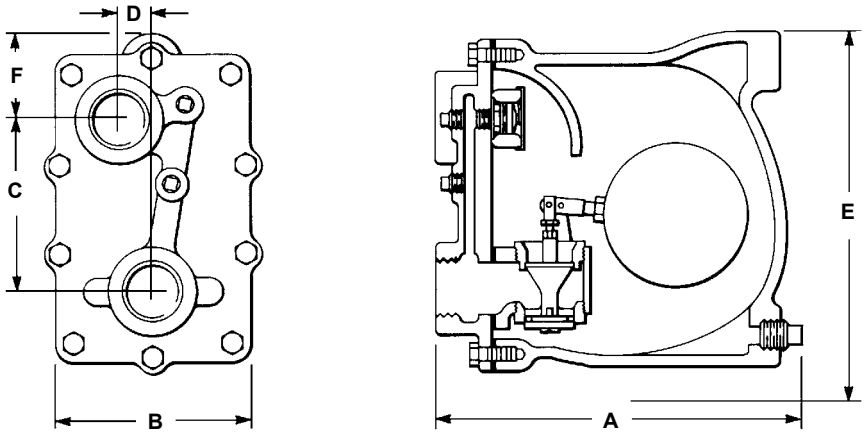
Materials

2-½" FTB-125
2-½" FTB-200



No.	Part	Material	
1	Body	Cast Steel	ASTM A216 WCB
2	Cover Screws	Carbon Steel	ASTM A449 Type 1
3	Cover Gasket	Graphite	
4	Cover	Cast Steel	ASTM A216 WCB
5	Valve Seat	Stainless Steel	
6	Valve Assembly Gasket	Graphite	
7	Main Valve Assembly Screws	Stainless Steel	
8	Ball Float	Stainless Steel	
9	Air Vent Assembly	Stainless Steel	
	Air Vent Head	Stainless Steel	
	Air Vent Seat	Stainless Steel	
15	Main Valve Assy Housing	Stainless Steel	
16	Pivot Pin	Stainless Steel	
17	Valve Head	Stainless Steel (FTB-175)	
		Cast Stainless Steel (FTB-125)	
18	Float Arm	Stainless Steel (FTB-175)	

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



2-½" FTB-125 and 200

Type and Size	A	B	C	D	E	F	Weight
FTB-125 2-½"	15.4 (391)	9.25 (235)	6.9 (175)	1.4 (36)	14.4 (366)	4.0 (102)	112 lb (50.8 kg)
FTB-200 2-½"							

Sample specification

Steam traps shall be of the mechanical float type having cast steel bodies, NPT or SW connections, and stainless steel valve heads and seats. Incorporated into the trap body shall be a stainless steel balanced pressure thermostatic air vent capable of withstanding 572 °F operating temperature and resisting waterhammer without sustaining damage. Internals of the trap shall be completely servicable without disturbing the piping. Trap tested in accordance to ANSI/FCI 85-1. Capacity data obtained in accordance to PTC 39.1.

Installation

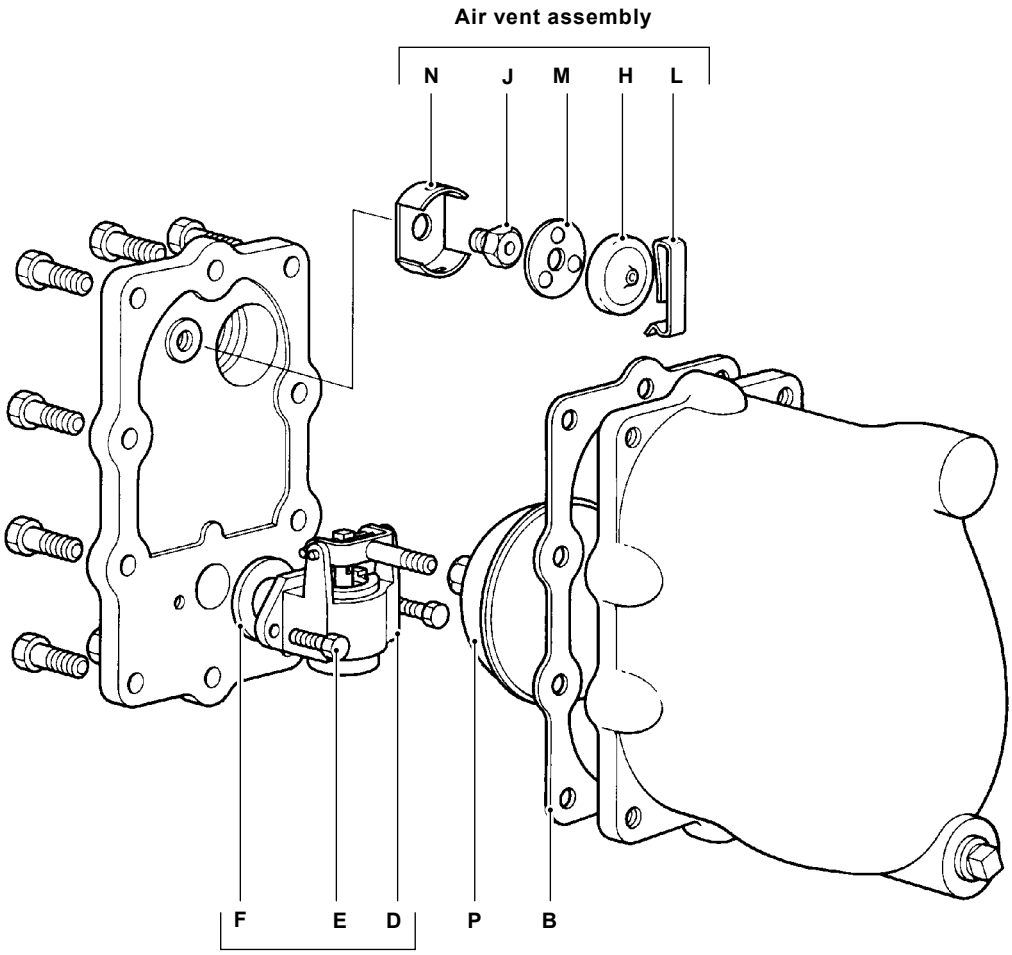
A pipeline strainer should be installed ahead of any steam trap. Full-port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap, in a position with the float arm in a horizontal plane so that the float rises and falls vertically, and with the direction of flow as indicated on the cover. Refer to IMI 2.300 for complete instructions.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, and operating mechanism.
Worn or damaged parts should be replaced using a complete valve mechanism assembly and/or air vent assembly.
Complete installation and maintenance instructions are given in IMI 2.300, which accompanies the product.

Spare Parts

Gasket kit (3 of each)	**B, E (F)**
Air vent Kit	**H, J, L, M, N**
Valve mechanism kit (less float)	**D, E, F**
Float	**P**



TI-P038-07-US
Issue 1

Cast Iron Float and Thermostatic Steam Traps FT, FTI and FTB Capacities

Capacities in lb/h hot condensate

Differential pressure		FT-15				FT-30			
Psi	Bar	¾" 1"	1¼"	1½"	2"	¾" 1"	1¼"	1½"	2"
¼	.017	279	600	1100	2300	279	375	1000	1300
½	.034	369	770	1700	2800	369	500	1300	1800
1	.07	489	980	2400	3600	489	690	1700	2500
2	.14	650	1240	3300	4650	650	910	2300	3400
5	.34	785	1640	5000	6900	785	1200	3400	5200
10	.69	1000	2000	6600	9000	1000	1500	4600	6800
15	1.0	1075	2340	7600	10900	1075	1680	5500	7800
20	1.4					1210	1800	6000	8600
30	2.1					1370	2000	7000	10000
40	2.8								
50	3.4								
75	5.2								
100	6.9								
125	8.6								

orifice dia.	.218" (5.53 mm)	.312" (7.92 mm)	.500" (12.7 mm)	.625" (15.9 mm)	.218" (5.54 mm)	.228" (5.79 mm)	.390" (9.91 mm)	.500" (12.7 mm)

Capacities in lb/h hot condensate, continued on next page

Capacities in lb/h hot condensate

Differential pressure		FT-75			FT-125		
Psi	Bar	¾" 1"	1¼" 1½"	2"	¾" 1"	1¼" 1½"	2"
¼	.017	160	550	850	100	400	550
½	.034	213	725	1100	135	520	675
1	.07	280	960	1500	175	680	880
2	.14	365	1300	2000	230	890	1225
5	.34	520	1900	3100	330	1300	1950
10	.69	700	2650	4150	415	1700	2600
15	1.0	795	3050	4750	500	2050	3000
20	1.4	875	3400	5200	565	2300	3250
30	2.1	970	4000	5800	665	2700	3800
40	2.8	1120	4400	6400	750	3000	4200
50	3.4	1230	4750	6800	830	3200	4600
75	5.2	1450	5400	7700	970	3800	5500
100	6.9				1110	4200	6100
125	8.6				1190	4500	6600

orifice dia.	.166" (4.22 mm)	.312" (7.92 mm)	.421" (10.7 mm)	.125" (3.18 mm)	0.246" (6.25 mm)	.332" (8.43 mm)

Capacities in lb/h hot condensate (continued)

Differential pressure		FTI-15		FTI-30		FTI-75		FTI-125		FTI-200	
Psi	Bar	½" ¾" 1"	1½"	½" ¾" 1"	1½"	½" ¾" 1"	1½"	½" ¾" 1"	1½"	½" ¾" 1"	1½"
¼	.017	279	1020	279	960	160	850	100	520	50	520
½	.034	369	1784	369	1598	213	1450	135	1020	75	1020
1	.07	489	3455	489	2976	280	1880	175	1600	115	1600
2	.14	650	5331	650	4290	365	2683	230	1970	180	1970
5	.34	785	6430	785	5326	520	3335	330	2945	230	2945
10	.69	1000	8163	1000	6413	700	4414	415	3141	305	3141
15	1.0	1075	9673	1075	7850	795	5024	500	3958	365	3958
20	1.4			1210	8242	875	5690	565	4304	415	4304
30	2.1			1370	10200	970	6600	665	5094	495	5094
40	2.8					1120	7111	750	5503	530	5503
50	3.4					1230	7625	830	5655	575	5655
75	5.2					1450	9615	970	6505	680	6505
100	6.9							1110	7666	750	7666
125	8.6							1190	8554	820	8554
150	10.3									895	10026
175	12.0									930	10500
200	13.8									985	11059
orifice dia.		.218" (5.53 mm)	.625" (15.9 mm)	.218" (5.54 mm)	.500" (12.7 mm)	.166" (4.22 mm)	.421" (10.7 mm)	.125" (3.18 mm)	.332" (8.43 mm)	.100" (2.54 mm)	.332" (8.43 mm)

Capacities in lb/h hot condensate

Differential pressure		FT-150				FT-200			
psi	bar	¾"	1"	1¼"	1½"	¾"	1"	1¼"	1½"
¼	.017	170	170	275	275	120	120	250	250
½	.034	235	235	360	360	160	160	335	335
1	.07	315	315	470	470	210	210	450	450
2	.14	425	425	610	610	280	280	600	600
5	.34	650	650	920	920	400	400	870	870
10	.69	810	810	1120	1120	520	520	1100	1100
15	1.0	940	940	1300	1300	600	600	1280	1280
20	1.4	1020	1020	1415	1415	660	660	1410	1410
30	2.1	1175	1175	1600	1600	770	770	1640	1640
40	2.8	1310	1310	1770	1770	850	850	1800	1800
50	3.4	1410	1410	1935	1935	910	910	1910	1910
75	5.2	1625	1625	2210	2210	1050	1050	2200	2200
100	6.9	1755	1755	2360	2360	1175	1175	2410	2410
125	8.6	1900	1900	2600	2600	1260	1260	2610	2610
150	10.3	2025	2025	2750	2750	1370	1370	2825	2825
175	12.1					1440	1440	2975	2975
200	13.8					1512	1512	3130	3130

*2½ FTB-200 ONLY

For kg/h, multiply by .454

Orifice diameter

in **(mm)**	.152 (3.86)	.152 (3.86)	.250 (6.35)	.250 (6.35)	.128 (3.25)	.128 (3.25)	.203 (5.16)	.203 (5.16)

*each orifice of a double seated trap.

Capacities in lb/h hot condensate (continued)

Differential pressure		FTB-20	FTB-30	FTB-50	FTB-125	FTB-175	FTB-200	FTB-175 and FTB-200
psi	bar	2"	2"	1½"	2½"	2"	1½"	2½"
¼	.017	6000	12000	875	19000	2600	920	7000
½	.034	7500	15800	1240	24000	4000	1300	12000
1	.07	9000	19000	1758	29200	5550	1850	17000
2	.14	11500	24000	1995	35000	7100	2100	21000
5	.34	15500	31500	2470	44000	9500	2600	27000
10	.69	19000	38000	3040	52000	11500	3200	32000
15	1.0	22000	41500	3563	57500	13000	3750	35500
20	1.4	25000	43500	3990	61500	14000	4200	38500
30	2.1		45500	4750	68500	16000	5000	42500
40	2.8			5368	73500	17500	5650	46000
50	3.4			5910	78000	18500	6220	48500
75	5.2				86000	21000	7400	54000
100	6.9				93000	22500	8310	58000
125	8.6				100000	24000	9220	61000
150	10.3					25500	10150	64000
175	12.1					27000	10950	68000
200	13.8						11498	69400*

*2½ FTB-200 ONLY

For kg/h, multiply by .454

Orifice diameter

in **(mm)**	.937 (23.8)	2.125* (54.0*)	.375* (9.53*)	2.125* (54.0*)	.750* (19.05*)	.375* (9.53*)	1.500* (38.1*)

*each orifice of a double seated trap.

TI-S02-03
CMGT Issue 14

FT14
Ball Float Steam Trap (Screwed)

Description
The FT14 is an SG iron bodied ball float steam trap having stainless steel working internals and integral automatic air venting facility. The FT14 can be maintained without disturbing the pipework.

Available types

FT14 (R-L)	Horizontal connections with flow from right to left
FT14 (L-R)	Horizontal connections with flow from left to right
FT14V	Vertical connections with flow downwards

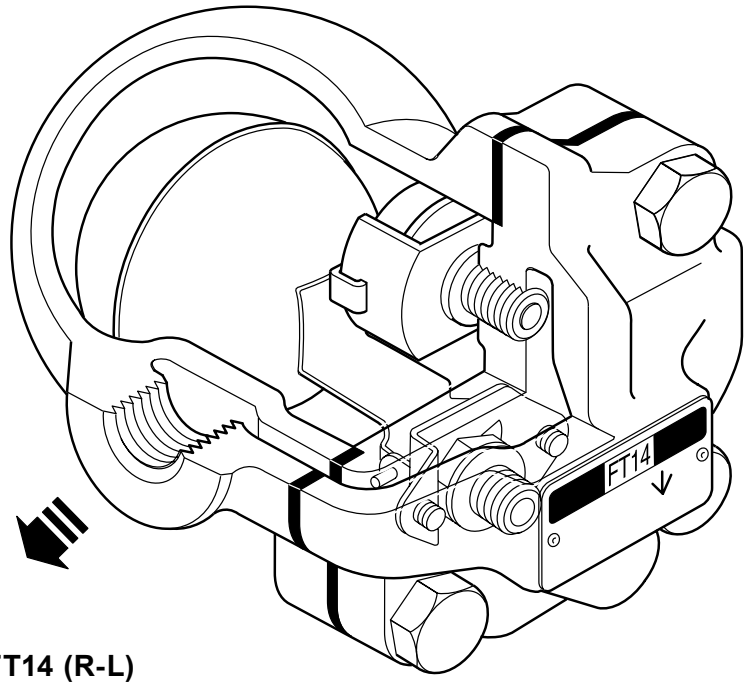
Capsule
The BP99/32 capsule which is used in the FT14 is suitable for use on 150 °C (270 °F) superheat @ 0 bar g (0 psi g) and 50 °C (91 °F) superheat @ 32 bar g (464 psi g).

Optional extras
A **manually adjustable needle valve** (designated 'C' on the nomenclature i.e. **FT14-C**) can be fitted to the trap. This option provides a **steam lock release** (**SLR**) feature in addition to the standard air vent. For further information please consult Spirax Sarco.

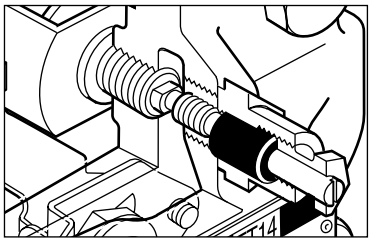
The FT14 has the option of an **integral strainer screen** (designated 'X' on the nomenclature i.e. **FT14X-**).

Standards
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

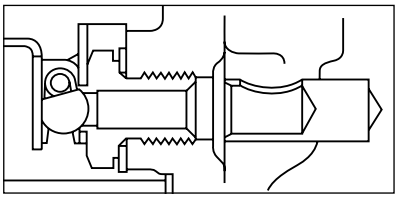
Certification
This product is available with a manufacturers' Typical Test Report.
Note: All certification / inspection requirements must be stated at the time of order placement.



FT14 (R-L)



FT14-C (R-L)

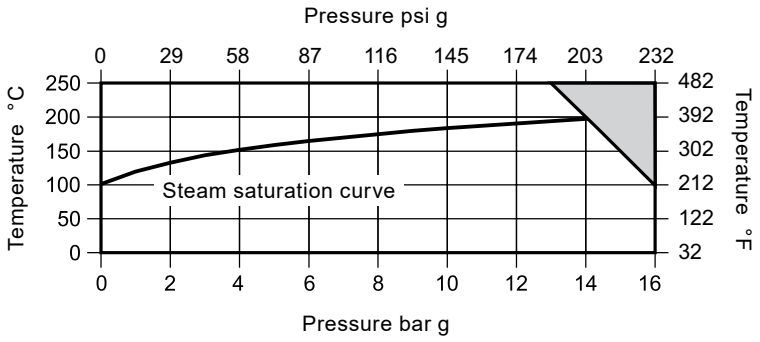


Main valve assembly 1"

Sizes and pipe connections

½", ¾" and 1" screwed BSP T Rp (ISO 7-1) or NPT.

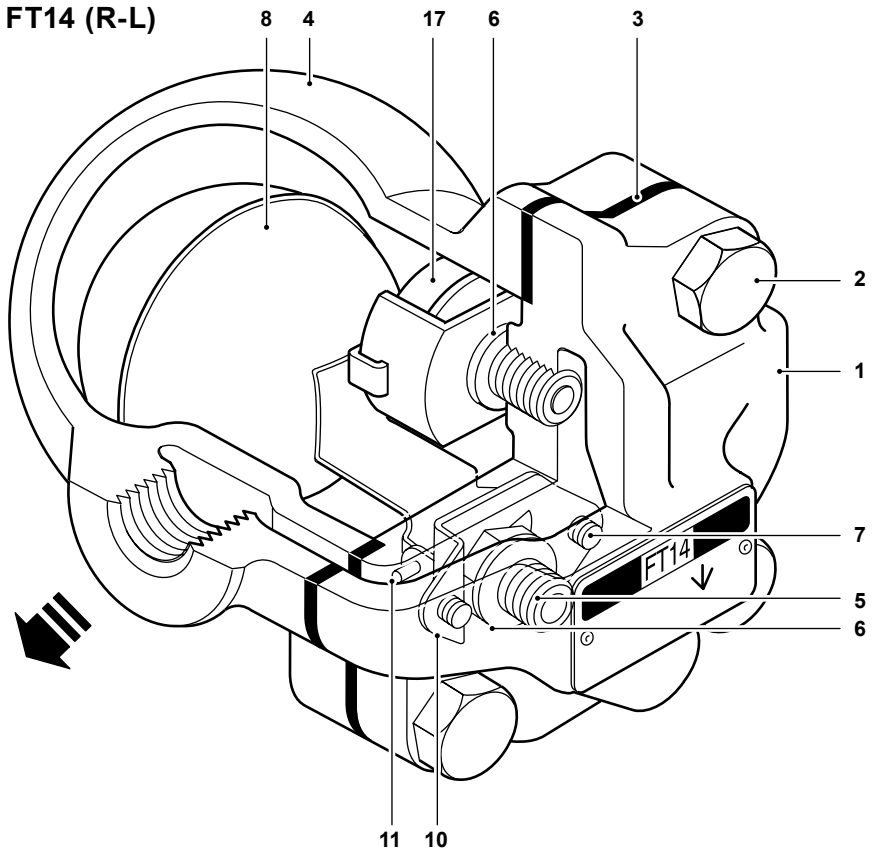
Pressure/temperature limits (ISO 6552)

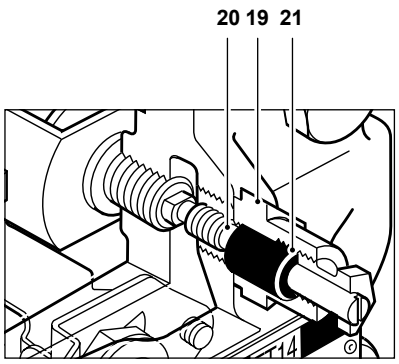


The product **must not** be used in this region.

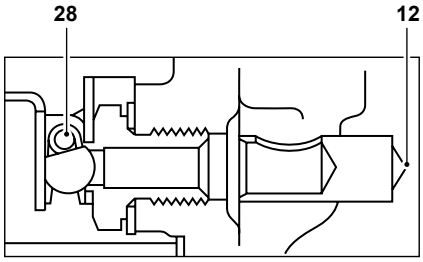
Body design conditions				PN16
PMA	Maximum allowable pressure		16 bar g @ 100 °C	232 psi g @ 212 °F
TMA	Maximum allowable temperature		250 °C @ 13 bar g	482 °F @ 189 psi g
Minimum allowable temperature			-10 °C	14 °F
PMO	Maximum operating pressure for saturated steam service		14 bar g	203 psi g
TMO	Maximum operating temperature		250 °C @ 13 bar g	482 °F @ 189 psi g
Minimum operating temperature			0 °C	32 °F
ΔPMX	Maximum differential pressure	FT14-4.5	4.5 bar	65 psi g
		FT14-10	10 bar	145 psi
		FT14-14	14 bar	203 psi
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of:			24 bar g	348 psi g

Materials





FT14-C (R-L)

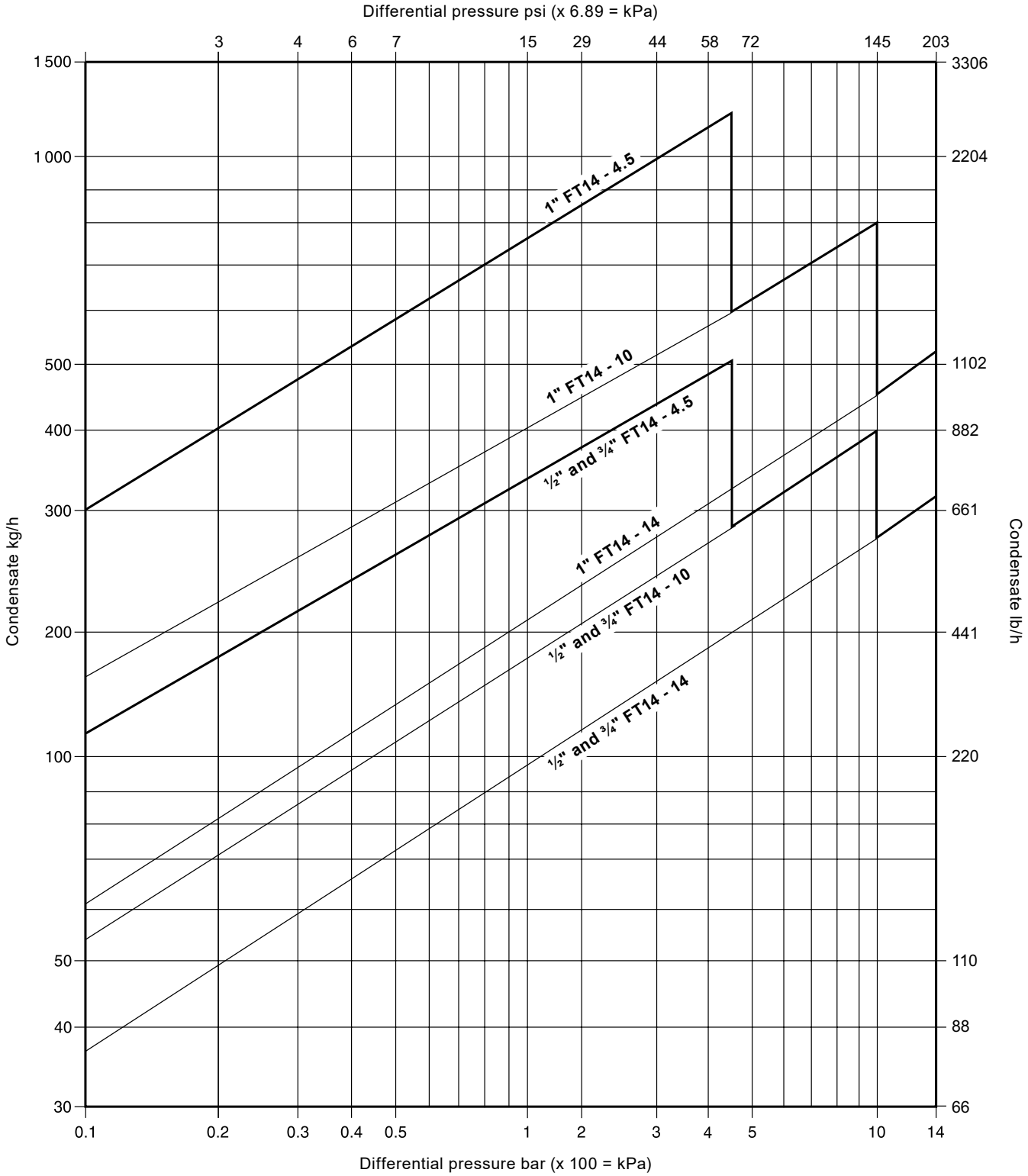


Main valve assembly 1"

No.	Part	Material	
1*	Body	SG iron	EN 1563 EN-GJS-400-15
2	Cover bolts	Steel	BS 3692 Gr.8.8
3	Cover gasket	Reinforced exfoliated graphite	
4	Cover	SG iron	EN 1563 EN-GJS-400-15
5	Valve seat	Stainless steel	BS 970 431 S29
6	Valve seat gasket	Stainless steel	BS 1449 409 S19
7	Pivot frame assembly screws	Stainless steel	BS 6105 Cl A2-70
8	Ball float and lever	Stainless steel	BS 1449 304 S16
10	Pivot frame	Stainless steel	BS 1449 304 S16
11	Pivot pin	Stainless steel	
12*	Erosion deflector (1" only)	Stainless steel	BS 970 431 S29
17	Air vent assembly	Stainless steel	
18	Air vent gasket	Stainless steel	BS 1449 409 S19
19	SLR assembly	Stainless steel	BS 970 303 S21
20	SLR gasket	Stainless steel	BS 1449 304 S16
21	SLR seal	Graphite	
28	Valve spring (1" only)	Stainless steel	BS 2056 302 S26

*** Note: Item 12 is pressed into item 1 (1" only).**

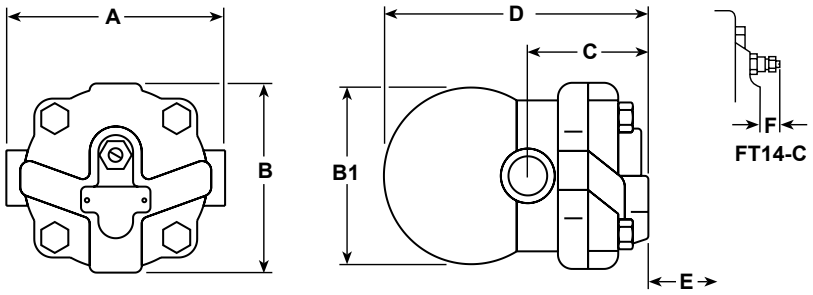
Capacities



Capacities shown above are based on condensate at saturation temperature. When discharging sub-cooled condensate the air vent provides extra capacity. Under start-up conditions when the condensate is cold the internal thermostatic air vent will be open and provides additional capacity to the main valve.
On 4.5 bar (65 psi) units this will provide a minimum of 50% increased capacity above the hot condensate figures shown. On 10 bar (145 psi) and 14 bar (203 psi) units this will be a minimum increase of 100% on the published capacity. The following table gives the minimum additional cold water capacities from the air vent.

ΔP (bar)	0.5 (7)	1 (15)	2 (29)	3 (44)	4.5 (65)	7 (102)	10 (145)	14 (203)
	Minimum additional cold water capacity (kg/h)							
½" and ¾"	70 (154)	140 (309)	250 (551)	380 (838)	560 (1235)	870 (1918)	1130 (2491)	1500 (3307)
1"	120 (265)	240 (529)	360 (794)	500 (1102)	640 (1411)	920 (2028)	1220 (2690)	1500 (3307)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	A	B	B1	C	D	E Withdrawal distance	F	Weight
½"	121 (4.8)	107 (4.2)	96 (3.8)	67 (2.6)	147 (5.8)	105 (4.1)	30 (1.1)	2.9 (6.4)
¾"								
1"	145 (5.74)	107 (4.2)	117 (4.6)	75 (3.0)	166 (6.5)	110 (4.3)	23 (0.9)	4.0 (8.8)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-S02-13) supplied with the product.

Installation note:

The FT14 must be installed with the direction of flow as indicated on the body, and with the float arm in a horizontal plain so that it rises and falls vertically. If required the flow orientation can be changed on site.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

How to order

Example: 1 off Spirax Sarco ½" FT14-4.5 (R-L) ball float steam trap with screwed BSP T Rp (ISO 7-1) connections and integral air vent.

Spare parts

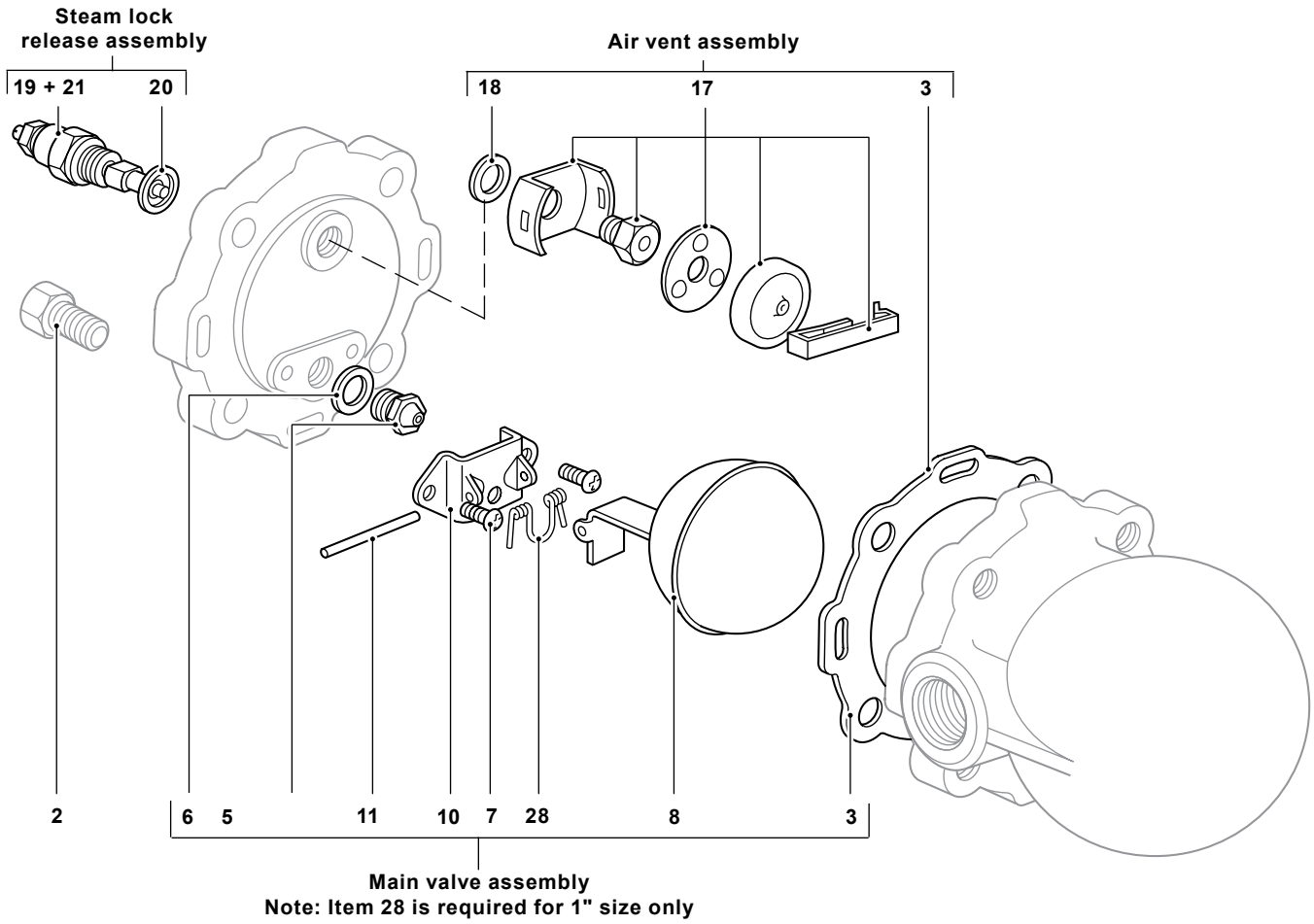
The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Main valve assembly with float	**3, 5, 6, 7** (2 off)**, 8, 10, 11, 28** (1" only)
Air vent assembly	**3, 17, 18**
Steam lock release and air vent assembly	**3, 17, 18, 19, 20, 21**
Cover gasket (packet of 3)	**3**
Maintenance kit	**3, 5, 6, 7** (2 off)**, 8, 10, 11, 17, 18, 28** (1" only)

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, type of trap and pressure range.
Example: 1 - Main valve assembly for a Spirax Sarco ½" FT14-10 ball float steam trap.



Recommended tightening torques

Item	or mm		N m	ft lbf
2	17 A/F	M10 x 30	47 - 50	35 - 37
5	17 A/F		50 - 55	37 - 41
7	Pozidrive	M4 x 6	2.5 - 3.0	1.8 - 2.2
17	17 A/F		50 - 55	37 - 41
19 and **21**	19 A/F		50 - 55	37 - 41

TI-P615-01
CMGT Issue 8

IFT14
Ball Float Steam Trap with Integral Spiratec Sensor

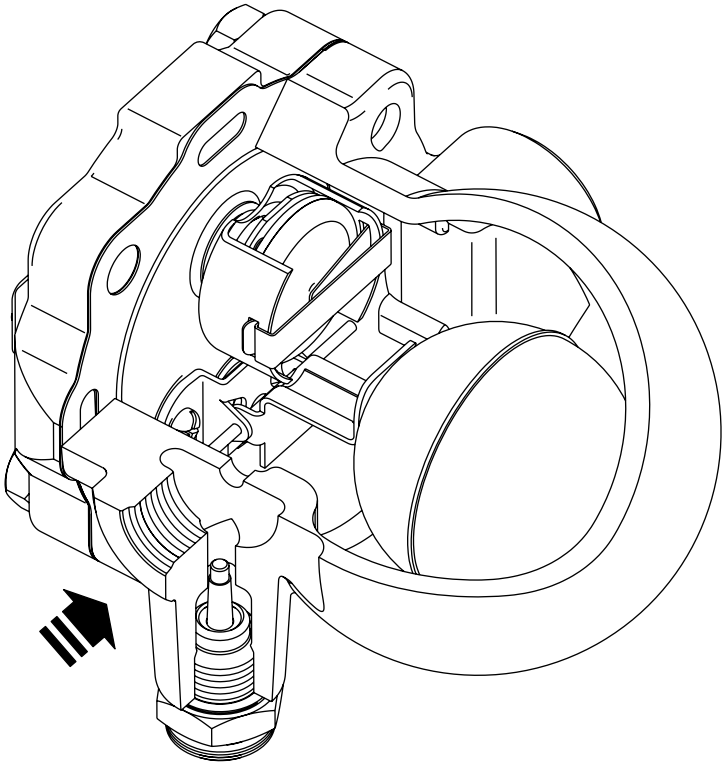
Description
The IFT14 is an SG iron bodied ball float steam trap having stainless steel working internals, integral Spiratec sensor and automatic air venting facility. It can be supplied with either a WLS1 sensor to detect waterlogging and steam leakage or a SS1 sensor for steam leakage only. The IFT14 is supplied with horizontal connections, having flow from right to left (R – L), and can be simply integrated into all existing Spiratec monitoring systems.

Capsule
The BP99/32 capsule which is used in the FT14 is suitable for use on 150 °C (270 °F) superheat @ 0 bar g (0 psi g) and 50 °C (91 °F) superheat @ 32 bar g (464 psi g).

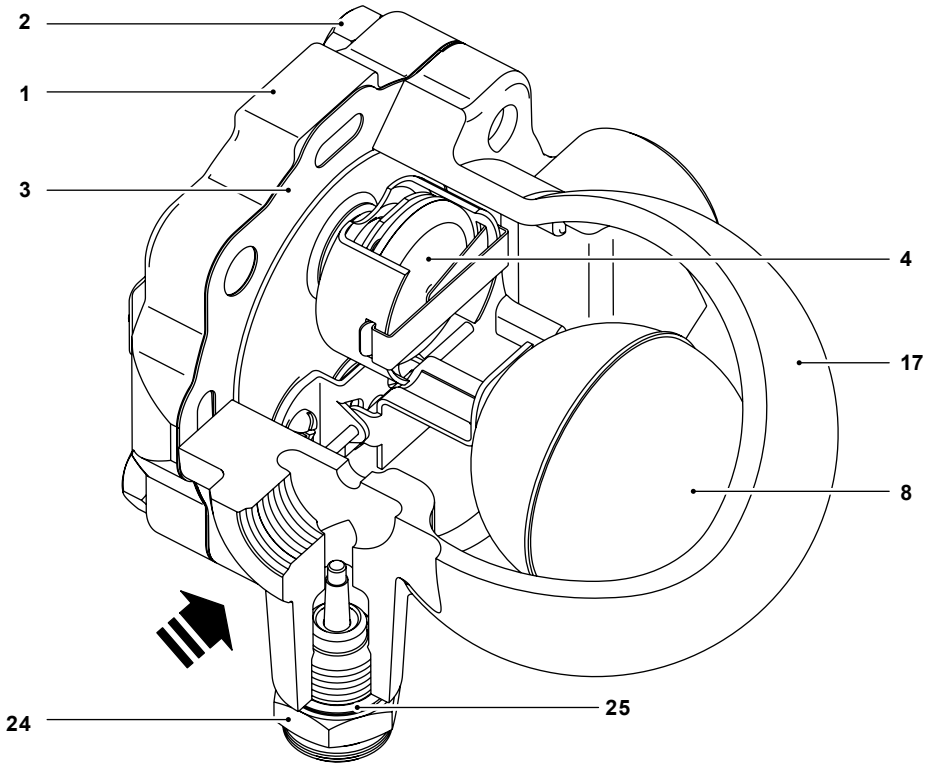
Standards
The product fully complies with the requirements of the Pressure Equipment Directive (PED).

Certification
This product is available with a manufacturers' Typical Test Report.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections
½" and ¾" screwed BSP or NPT.



Materials

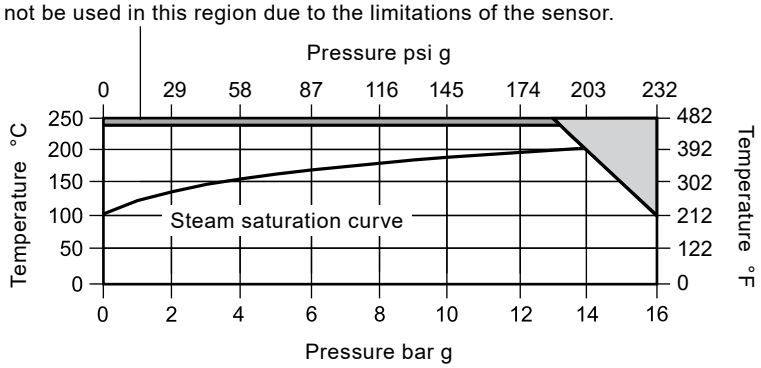


*** Note:** Items 5, 6, 7, 10, 11 and 18 are shown more clearly in spare parts.

No.	Part	Material	
1	Body	SG iron	DIN 1693 GGG 40
2	Cover bolts	Steel	BS 3692 Gr. 8.8
3	Cover gasket	Stainless steel reinforced exfoliated graphite	
4	Cover	SG iron	DIN 1693 GGG 40
5 *	Valve seat	Stainless steel	BS 970 431 S29
6 *	Valve seat gasket	Stainless steel	BS 1449 304 S11
7 *	Pivot frame assembly screws	Stainless steel	BS 6105 CI A2-70
8	Ball float and lever	Stainless steel	BS 1449 304 S16
10 *	Pivot frame	Stainless steel	BS 1449 304 S16
11 *	Pivot pin	Stainless steel	
17	Air vent assembly	Stainless steel	
18 *	Air vent seat gasket	Stainless steel	BS 1449 304 S11
24	Sensor	Stainless steel	BS 1449 304 S16
25	Sensor gasket	Stainless steel	BS 1449 304 S16
27	Blanking plug (not shown)	Steel	

Pressure/temperature limits (ISO 6552)

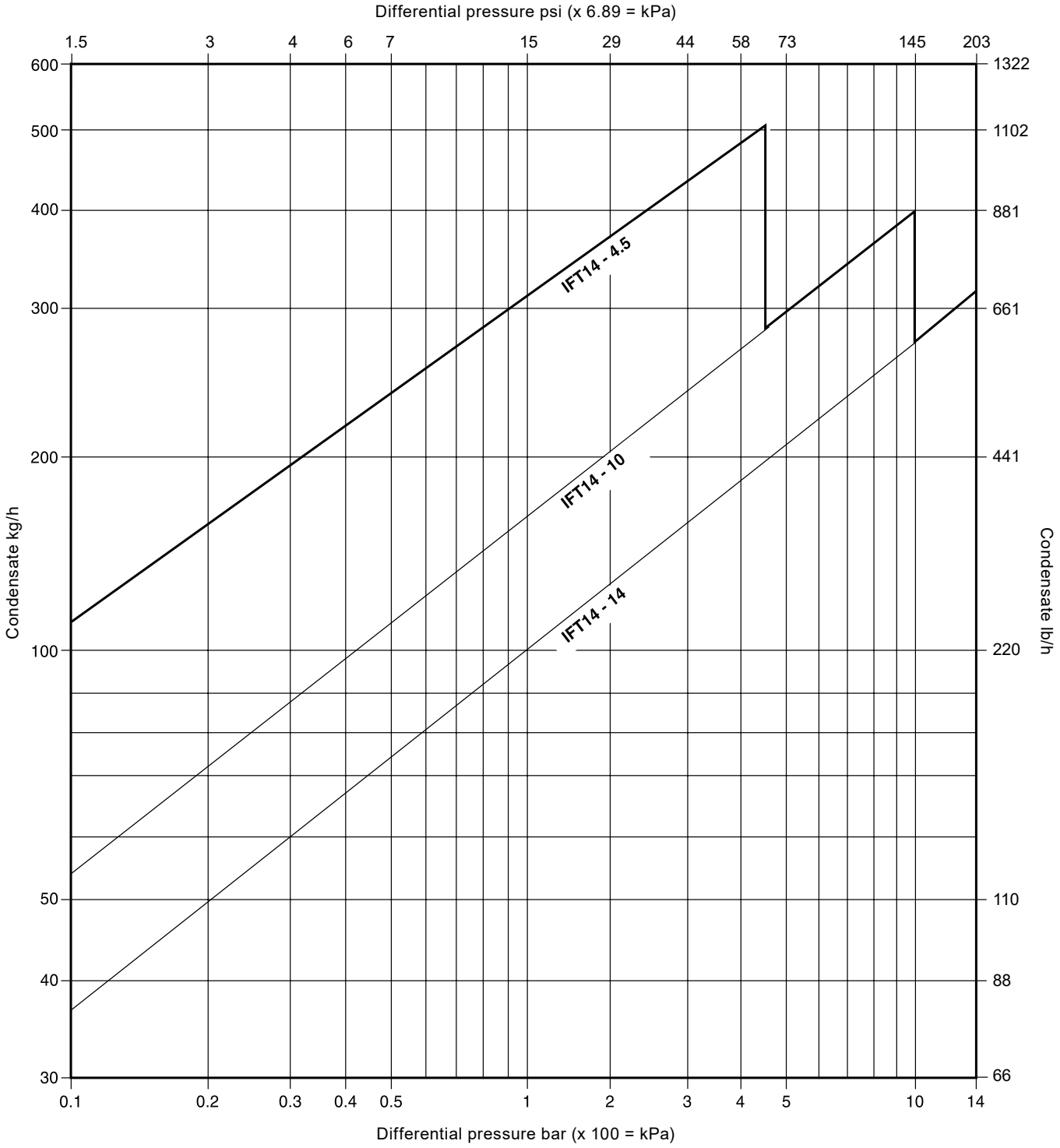
The product should not be used in this region due to the limitations of the sensor.



The product **must not** be used in this region.

Body design conditions				PN16
PMA	Maximum allowable pressure		16 bar g @ 100 °C	232 psi g @ 212 °F
TMA	Maximum allowable temperature		250 °C @ 13 bar g	482 °F @ 188 psi g
Minimum allowable temperature			-10 °C	14 °F
PMO	Maximum operating pressure for saturated steam service		14 bar g	203 psi g
TMO	Maximum operating temperature		240 °C @ 13 bar g	464 °F @ 188 psi g
Minimum operating temperature			0 °C	32 °F
ΔPMX	Maximum differential pressure	**IFT14-4.5**	4.5 bar	65 psi
		IFT14-10	10 bar	145 psi
		IFT14-14	14 bar	203 psi
Designed for a maximum cold hydraulic test pressure of:			24 bar g	348 psi g

Capacities

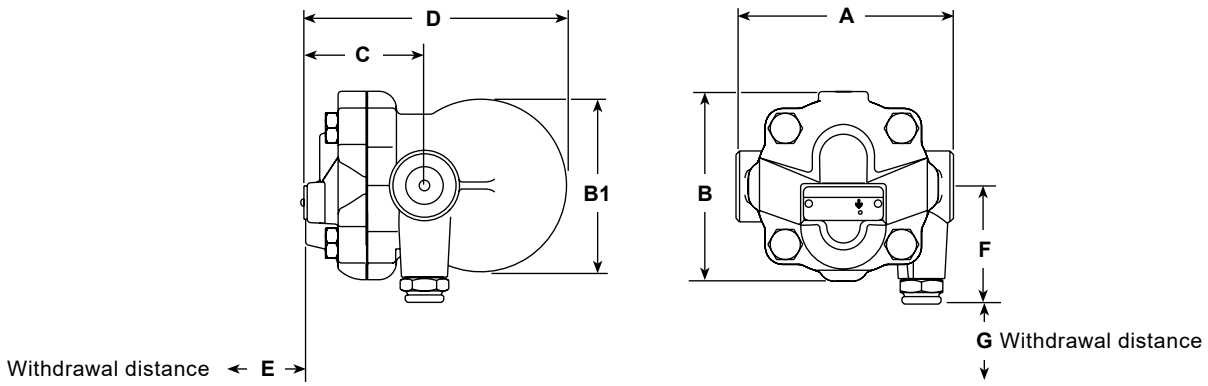


Additional cold water capacities from the thermostatic air vent under start-up conditions

Capacities shown above are based on condensate at saturation temperature. When discharging sub-cooled condensate the air vent provides extra capacity. Under start-up conditions when the condensate is cold the internal thermostatic air vent will be open and provides additional capacity to the main valve. On the IFT14-4.5 units, this will provide a minimum of 50% increased capacity above the hot condensate figures shown. On the IFT14-10 and IFT14-14 units there will be a minimum increase of 100% on the published capacity. The following table gives the minimum additional cold water capacities from the air vent.

ΔP (bar)	0.5 (7)	1 (15)	2 (29)	3 (44)	4.5 (65)	7 (101)	10 (145)	14 (203)
	Minimum additional cold water capacity (kg/h)							
½" and ¾"	70 (154)	140 (309)	250 (551)	380 (838)	560 (1235)	870 (1918)	1130 (2491)	1500 (3307)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	A	B	B1	C	D	E	F	G	Weight
½"	122.5 (4.8)	107 (4.2)	96 (3.8)	67 (2.6)	147 (5.8)	105 (4.1)	66 (2.6)	33 (1.3)	2.9 (6.4)
¾"									

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-F01-30) supplied with the product.

Installation note:

The IFT14 must be installed with the direction of flow as indicated on the body, and with the float arm in a horizontal plain so that it rises and falls vertically. It is recommended that a strainer, with a screen having 0.8 mm perforations, is installed upstream of the unit to ensure adequate removal of dirt from the steam system.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

How to order

Example: 1 off Spirax Sarco ½" IFT14-4.5 ball float steam trap with screwed BSP connections having either an integral sensor to identify waterlogging and steam wastage (WLSI sensor) or for steam leakage only (SSI sensor). Sensors to be compatible with Spiratec indicators, automatic monitors and test points:

- R1 (single trap) remote test point,
- R12 (12 trap) remote test point,
- Type 30 hand held indicator,
- R16C (16 traps) automatic steam trap monitor with PNP/NPN output where appropriate.

Spare parts

The spare parts available are shown in solid outline. Parts shown in a grey line are not supplied as spares.

Available spares

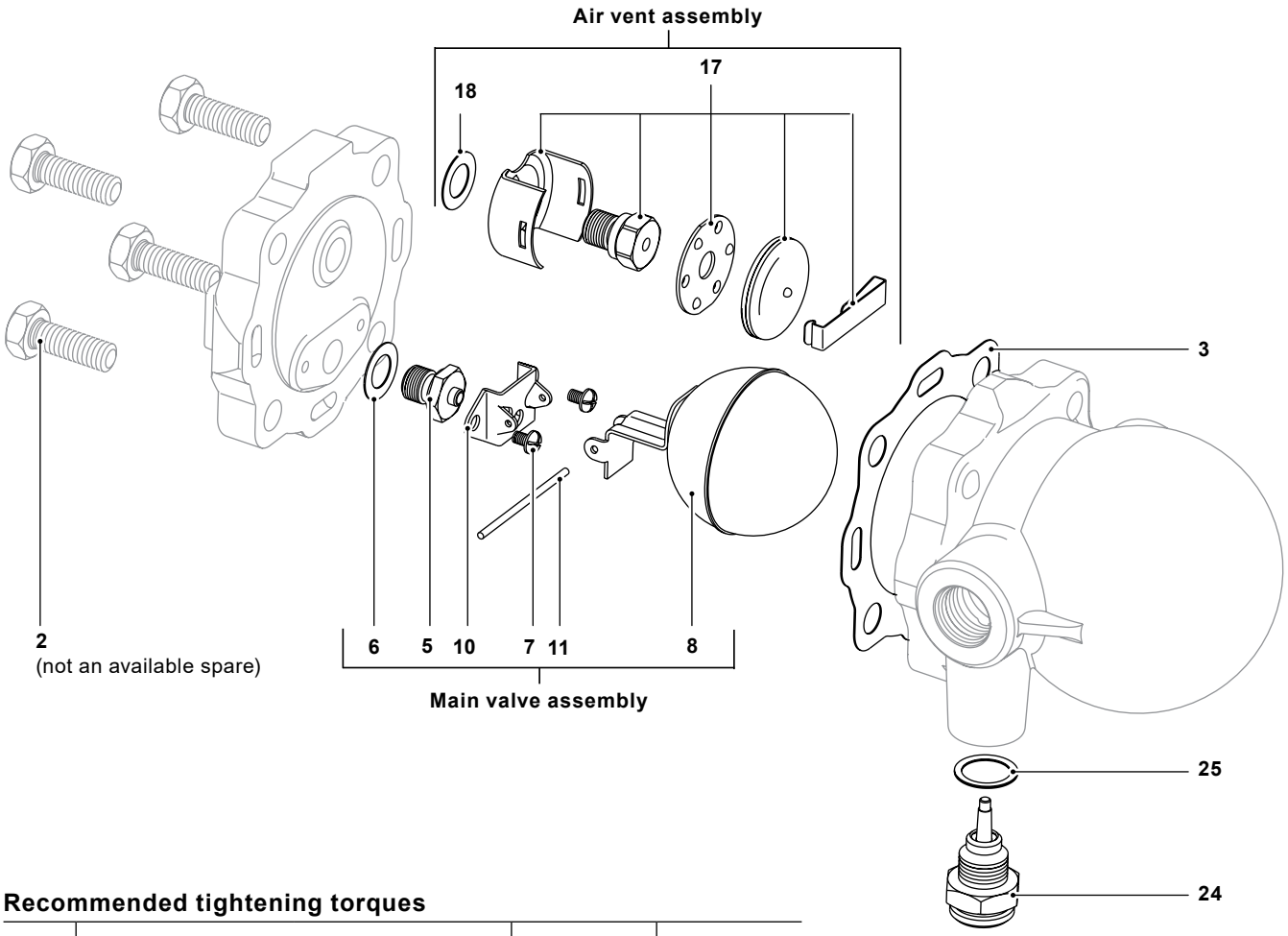
Main valve assembly with float	**3, 5, 6, 7 (2 off), 8, 10, 11**
Air vent assembly	**3, 17, 18**
Cover gasket (packet of 3)	**3**
Sensor and sensor gasket	**24, 25**

How to order spares

Always order spare parts by using the description given in the column headed 'Available spares' and state the size, Model no. and pressure rating of the trap.

Example: 1 - Main valve assembly for a Spirax Sarco ½" IFT14-4.5 ball float steam trap with integral Spiratec sensor.

Note: The pressure range is either 4.5, 10 or 14 bar.

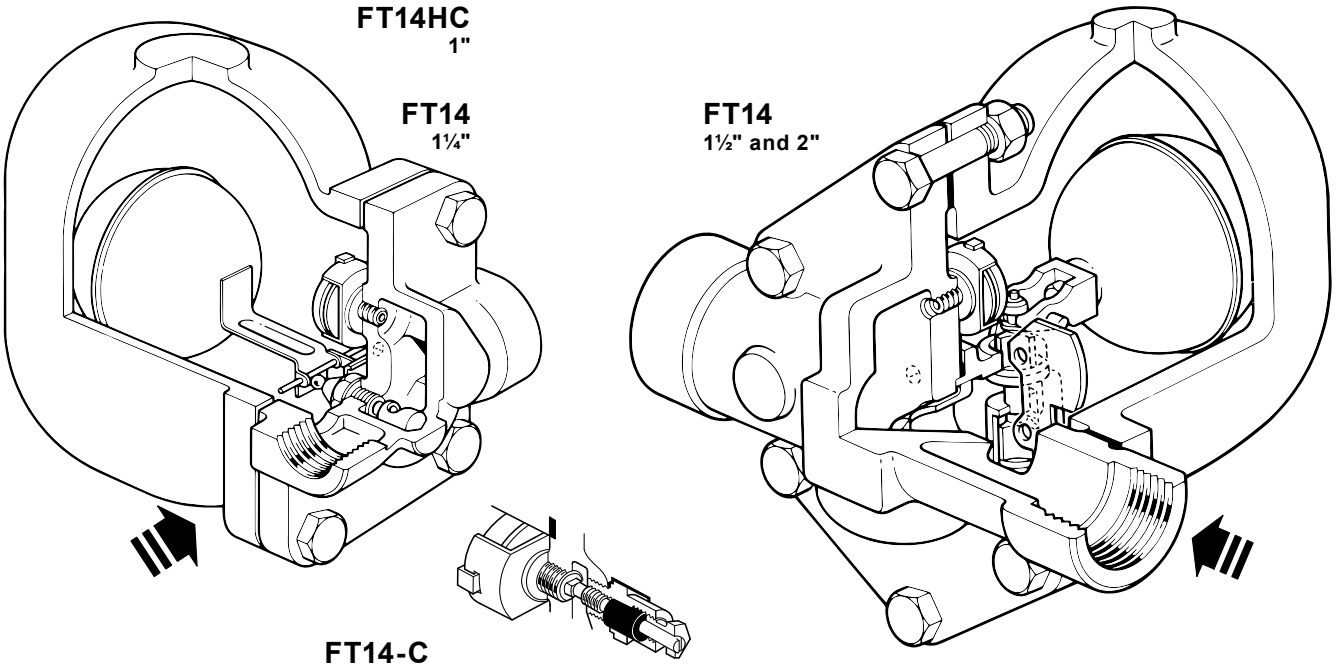


Recommended tightening torques

Item		or mm		N m	ft lbf
2	17 A/F		M10 x 30	45 - 55	33 - 41
5	17 A/F			50 - 55	37 - 41
7	Pozidrive		M4 x 6	2.5 - 3.0	1.8 - 2.2
17	17 A/F			50 - 55	37 - 41
24	24 A/F			50 - 55	37 - 41

TI-S02-27
CMGT Issue 11

FT14 and FT14HC
SG Iron
Ball Float Steam Traps (1" HC, 1¼", 1½" and 2")



Description

The FT14 and FT14HC are iron bodied ball float steam traps having stainless steel working internals and integral automatic air venting facility. These traps are supplied with horizontal screwed connections only and can be maintained without disturbing the pipework. The flow direction is as indicated on the valve body.

Available types

FT14	Standard 1¼", 1½" and 2"
FT14HC	High capacity (1" only) - As standard the FT14HC is available with flow direction in either left-to-right or right-to-left direction. Please state preference when placing an order.

Note: These ball float steam traps are available with either 4.5, 10 or 14 bar (65, 145, 203 psi) internals (ΔPMX).

Capsule

The BP99/32 capsule which is used in the FT14 and FT14HC ball float steam traps is suitable for use on 150 °C (270 °F) superheat @ 0 bar g (0 psi g) and 50 °C (91 °F) superheat @ 32 bar g (464 psi g).

Optional extras will only be supplied if specified at the point of order

A manually adjustable needle valve (designated 'C' on the nomenclature i.e. **FT14-C**) can be fitted to the trap. This option provides a **steam lock release (SLR)** feature in addition to the standard air vent. For further information please consult Spirax Sarco.

The **top of the cover can be drilled and tapped up to ⅜" BSP T Rp (ISO 7-1) or NPT** for the purpose of fitting a balance line.

The **bottom of the cover can be drilled and tapped ⅜" BSP T Rp (ISO 7-1) or NPT** for the purpose of fitting a drain cock.

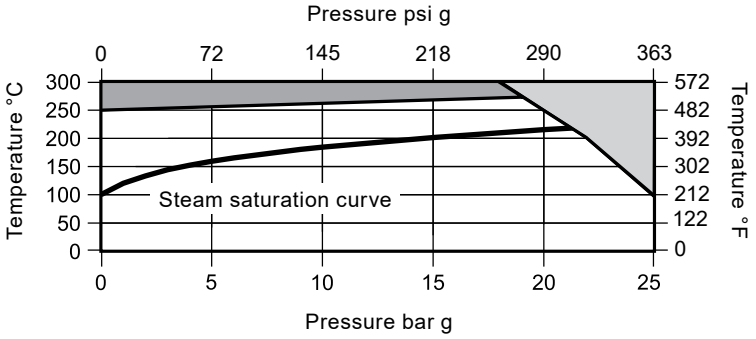
Standards
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification
This product is available with a manufacturers' Typical Test Report.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections
1" (FT14HC only), 1¼", 1½" and 2" screwed BSP T Rp (ISO 7-1) and NPT.

Pressure/temperature limits

PN25



FT14HC 1"

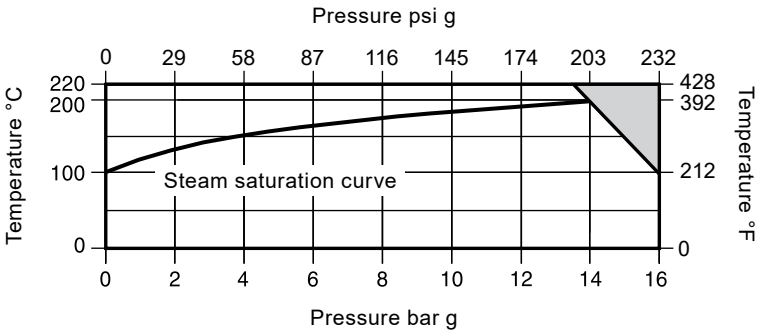
and

FT14 1¼"

The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

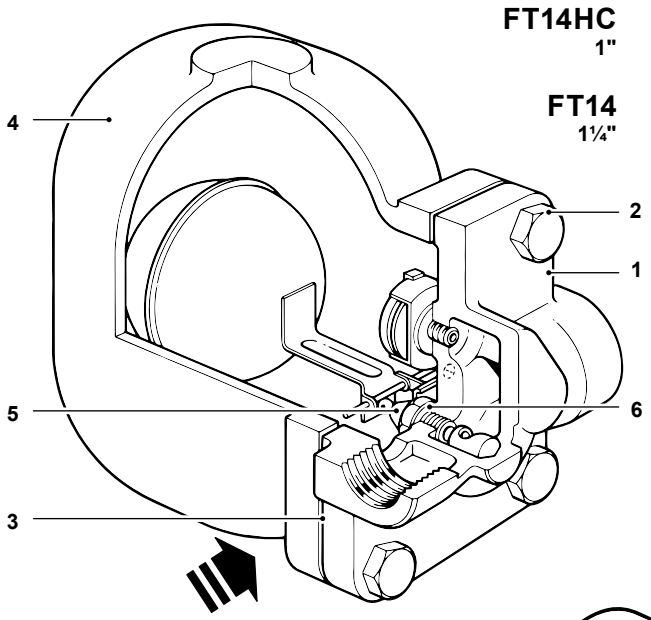
PN16

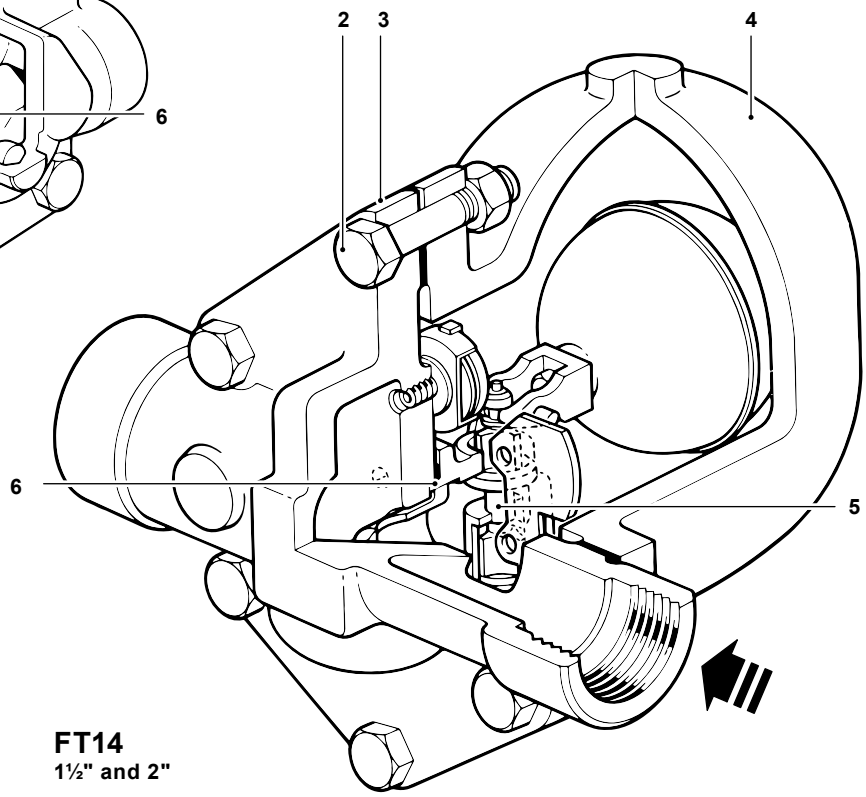


FT14 1½" and 2"

Size			**1" HC and 1¼"**		**1½" and 2"**
Body design conditions			PN25		PN16
PMA	Maximum allowable pressure		25 bar g @ 100 °C (363 psi g @ 212 °F)		16 bar g @ 100 °C (232 psi g @ 212 °F)
TMA	Maximum allowable temperature		300 °C @ 18 bar g (572 °F @ 261 psi g)		220 °C @ 13.5 bar g (428 °F @ 196 psi g)
Minimum allowable temperature			-10 °C (14 °F)		
PMO	Maximum operating pressure for saturated steam service		21 bar g (305 psi g)		14 bar g (203 psi g)
TMO	Maximum operating temperature		275 °C @ 19 bar g (527 °F @ 276 psi g)		220 °C @ 13.5 bar g (428 °F @ 196 psi g)
Minimum operating temperature **Note:** For lower temperatures consult Spirax Sarco			0 °C (32 °F)		
ΔPMX	Maximum differential pressure	**Size**	**1" HC**	**1¼"**	**1½" and 2"**
		4.5 bar	FT14HC-4.5	FT14-4.5	FT14-4.5
		10 bar	FT14HC-10	FT14-10	FT14-10
		14 bar	FT14HC-14	FT14-14	FT14-14
Product is safe for use under full vacuum conditions					
Designed for a maximum cold hydraulic test pressure of:			38 bar g (551 psi g)		24 bar g (348 psi g)

Materials



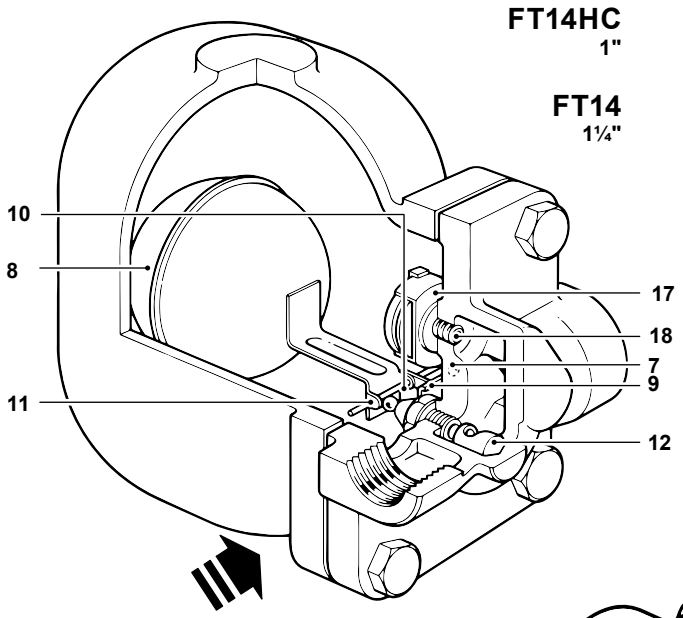


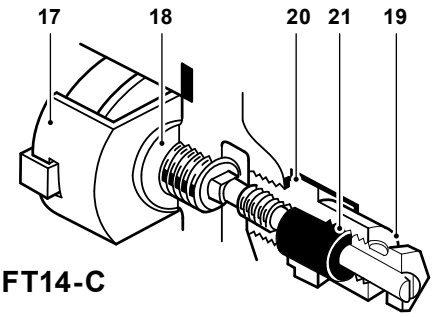
FT14
1½" and 2"

No.	Part		Material	
1	Body	1" and 1¼"	SG iron	BS EN 1563 JS 1030
		1½" and 2"	Cast iron	DIN 1691 GG 25
2	Cover bolts	1"	Steel	BS 3692 Gr. 8.8
	Cover bolts	1¼"	Steel	ASTM A193 B7
	Cover bolts and nuts	1½" and 2"	Steel	BS 3692 Gr. 8.8
3	Cover gasket		Reinforced exfoliated graphite	
4	Cover	1" and 1¼"	SG iron	BS EN 1563 JS 1030
		1½" and 2"	Cast iron	DIN 1961 GG 25
	Valve seat	1" and 1¼"	Stainless steel	BS 970 431 S29
5	Main valve assembly with erosion deflector	1½" and 2"	Stainless steel	BS 3146 Part 2 ANC 2
	Valve seat gasket	1" and 1¼"	Stainless steel	BS 1449 304 S11
6	Main valve assembly gasket	1½" and 2"	Reinforced exfoliated graphite	
	Pivot frame assembly set screws	1" and 1¼"	Stainless steel	BS 4183 18/8

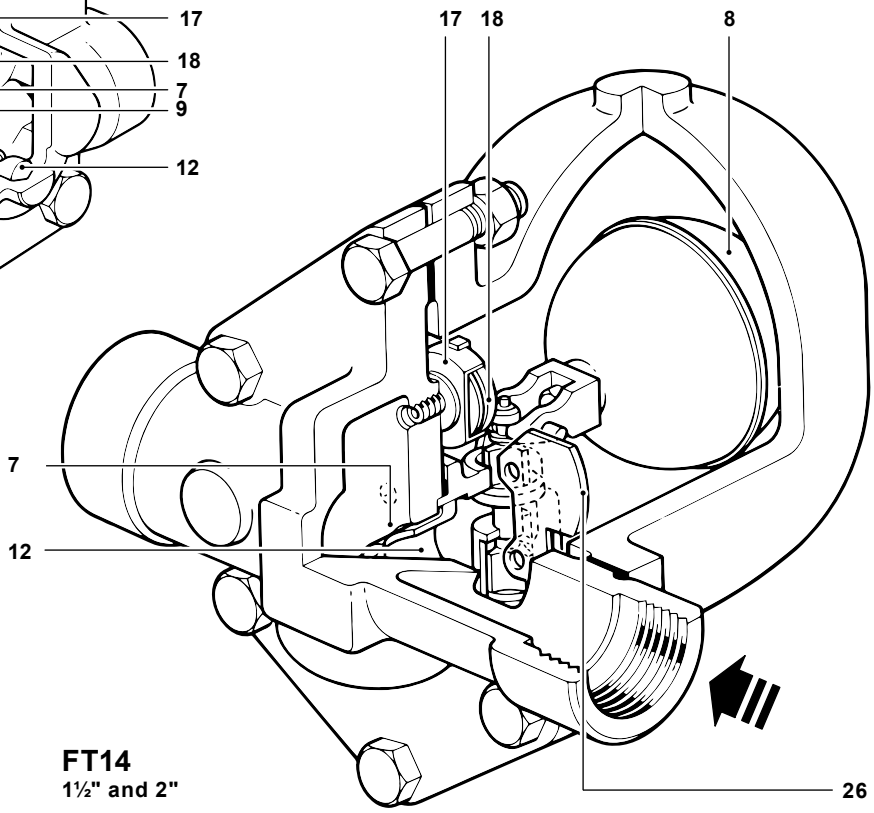
Materials are continued on the next page

Materials (continued)





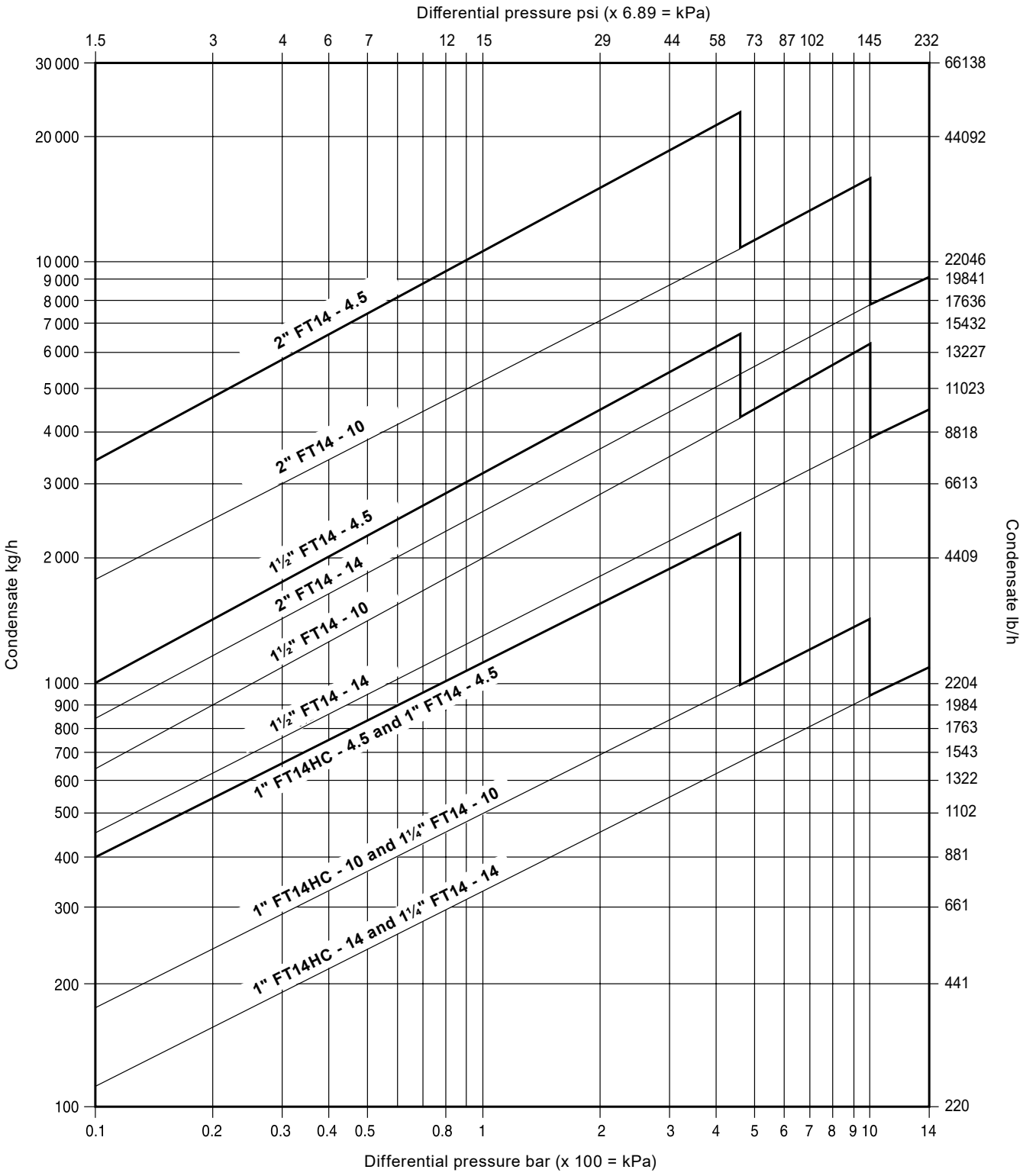
FT14-C



FT14
1½" and 2"

No.	Part			Material	
7	Main valve assembly bolts	Bolts	1½"	Stainless steel	ISO 3506-2: A2-70
		Studs and nuts	2"	Stainless steel	BS 6105 A4-80
8	Ball float and lever			Stainless steel	BS 1449 304 S16
9	Support frame		1" and 1¼"	Stainless steel	BS 1449 304 S16
10	Pivot frame		1" and 1¼"	Stainless steel	BS 1449 304 S16
11	Pivot pin		1" and 1¼"	Stainless steel	
12	Erosion deflector			Stainless steel	BS 970 431 S29
17	Air vent assembly			Stainless steel	
18	Air vent seat gasket			Stainless steel	BS 1449 304 S11
19	SLR assembly			Stainless steel	BS 970 303 S21
20	SLR gasket			Mild steel	BS 1449 CS4
21	SLR seal			Graphite	
26	Inlet plate		1½" and 2" only	Stainless steel	BS 1449 304 S16

Capacities



Additional cold water capacities from the thermostatic air vent under start-up conditions

Capacities shown above are based on condensate at saturation temperature.

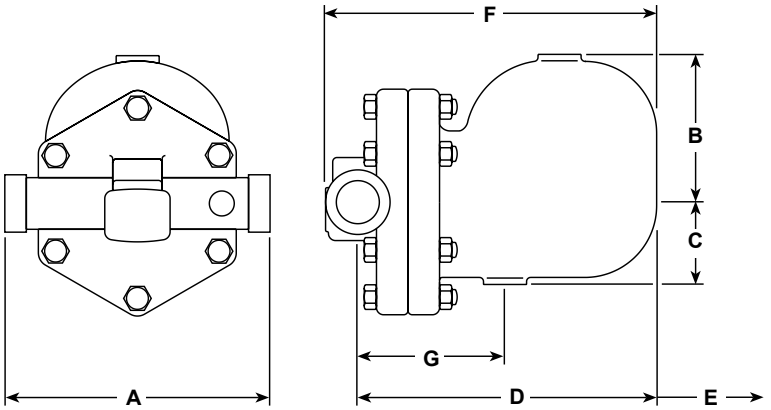
Under start-up conditions when the condensate is cold the internal thermostatic air vent will be open and provides additional capacity to the main valve.

The following table gives the minimum additional cold water capacities from the air vent.

ΔP bar (psi)	0.5 (7)	1 (15)	2 (29)	3 (44)	4.5 (65)	7 (102)	10 (145)	14 (203)
	Minimum additional cold water capacity kg/h (lb/h)							
1" HC	580 (1279)	600 (1323)	650 (1433)	670 (1477)	700 (1543)	1000 (2205)	1300 (2866)	1600 (3527)
1¼, 1½" and 2"								

Dimensions/weights (approximate) in mm (in) and kg (lb)

1½" and 2" shown



Size	A	B	C	D	E	F	G	Weight
1" HC	120 (4.7)	110 (4.3)	80 (3.1)	195 (7.7)	160 (6.3)	220 (8.7)	115 (4.5)	6.8 (15.0)
1¼"								6.9 (15.2)
1½"	270 (10.6)	130 (5.1)	108 (4.2)	248 (9.8)	200 (7.9)	270 (10.6)	115 (4.5)	17.5 (38.5)
2"	300 (11.8)	138 (5.4)	125 (4.9)	250 (9.8)	200 (7.9)	288 (11.3)	140 (5.5)	22.0 (48.5)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-S02-30) supplied with the product.

Installation note:

The FT14 must be installed with the direction of flow as indicated on the body, and with the float arm in a horizontal plane so that it rises and falls vertically.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

How to order

Example: 1 off Spirax Sarco 1" screwed BSP T Rp (ISO 7-1) FT14HC-14 ball float steam trap having an SG iron body and cover, with thermostatic air vent - flow direction left-to-right. The cover is to be suitable for tapping ⅜" for drain/balance pipe connection.

Spare parts

The spare parts available are shown in solid outlines. Parts drawn in a grey line are not supplied as spares.

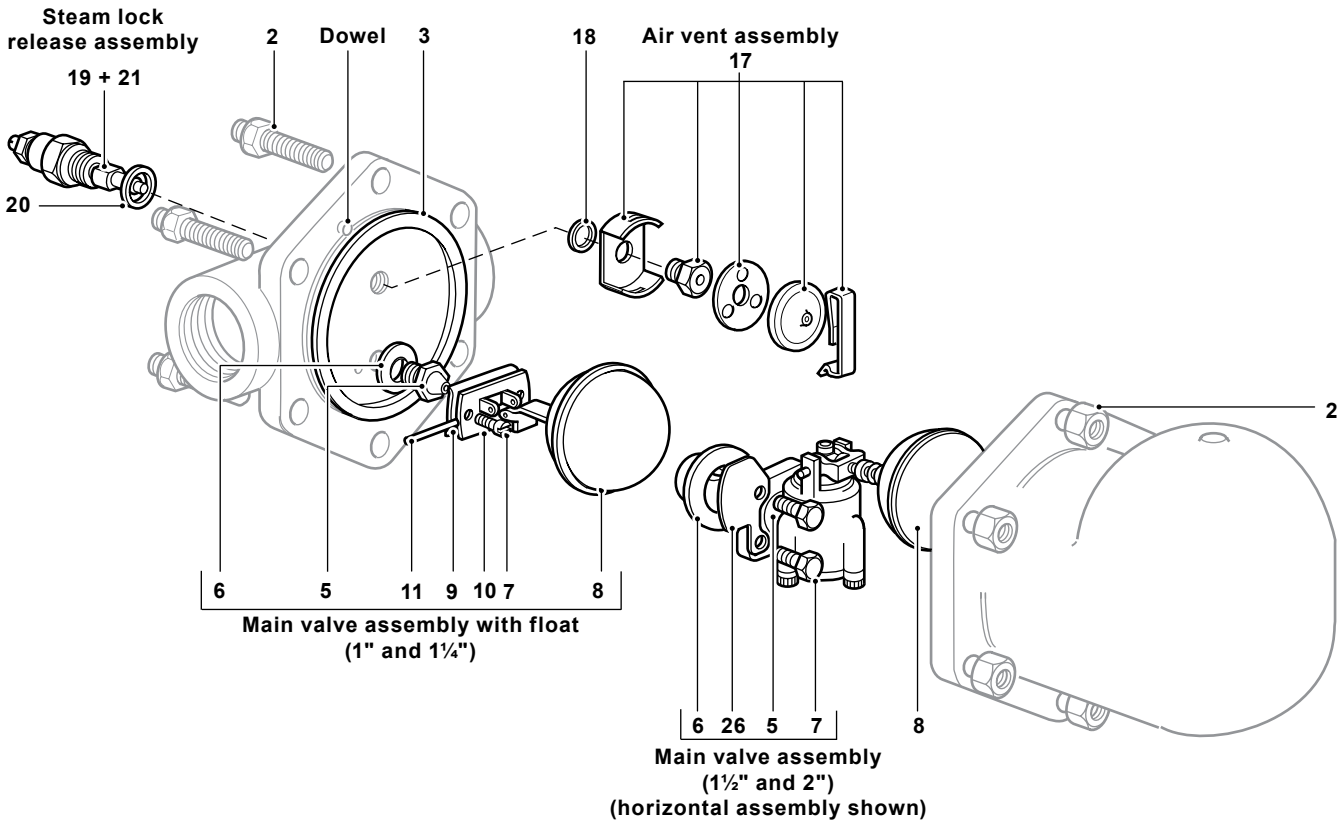
Available spares

Main valve assembly	with float (1" and 1¼")	**5, 6, 7, 8, 9, 10, 11**
	with erosion deflector (1½" and 2")	**5, 6, 7, 26**
Ball float (1½" and 2")		**8**
Air vent assembly		**17, 18**
Manually adjustable needle valve (SLR) and air vent assembly		**17, 18, 19, 20, 21**
Complete set of gaskets (packet of 3 sets)		**3, 6, 18, 20**

Note: The erosion deflector on the 1" and 1¼" is pressed into the body during manufacture and is not available as a spare.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.
Example: 1 - Air vent assembly for a Spirax Sarco 2" FT14-4.5 ball float steam trap.

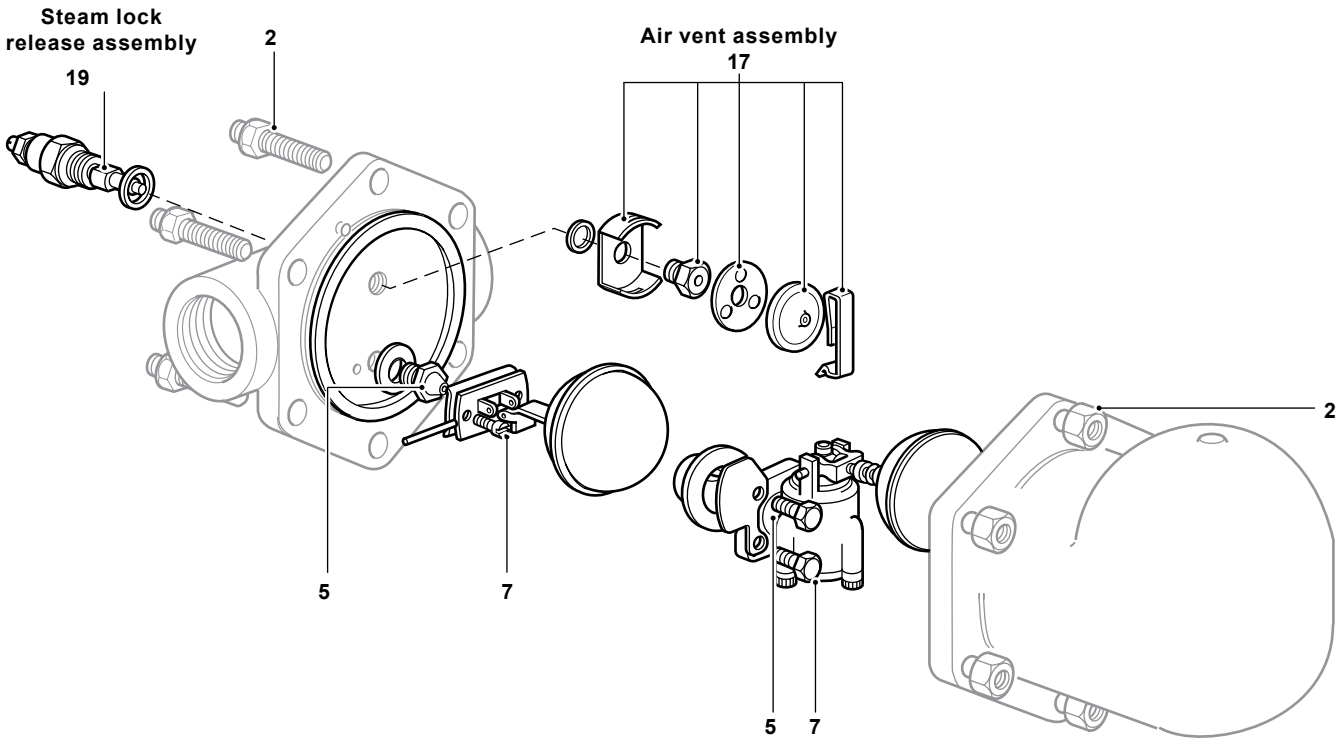


Recommended tightening torques are shown on the next page

Recommended tightening torques

Item	Size	or mm		N m	ft lbf
2	1"	17	M10 x 30	29 - 33	21 - 24
	1¼"	14*	M10 x 30	29 - 33	21 - 24
	1½"	19	M12 x 60	60 - 66	44 - 49
	2"	24	M16 x 70	80 - 88	59 - 65
5	1" and 1¼"	17	-	40 - 45	30 - 33
7	1" and 1¼"	-	M5 x 20	10 - 12	7 - 9
	1½"	10	M6 x 20	10 - 12	7 - 9
	2"	13	M8 x 20	20 - 24	15 - 18
17	-	17	-	50 - 55	37 - 41
19	-	21	-	40 - 45	30 - 33

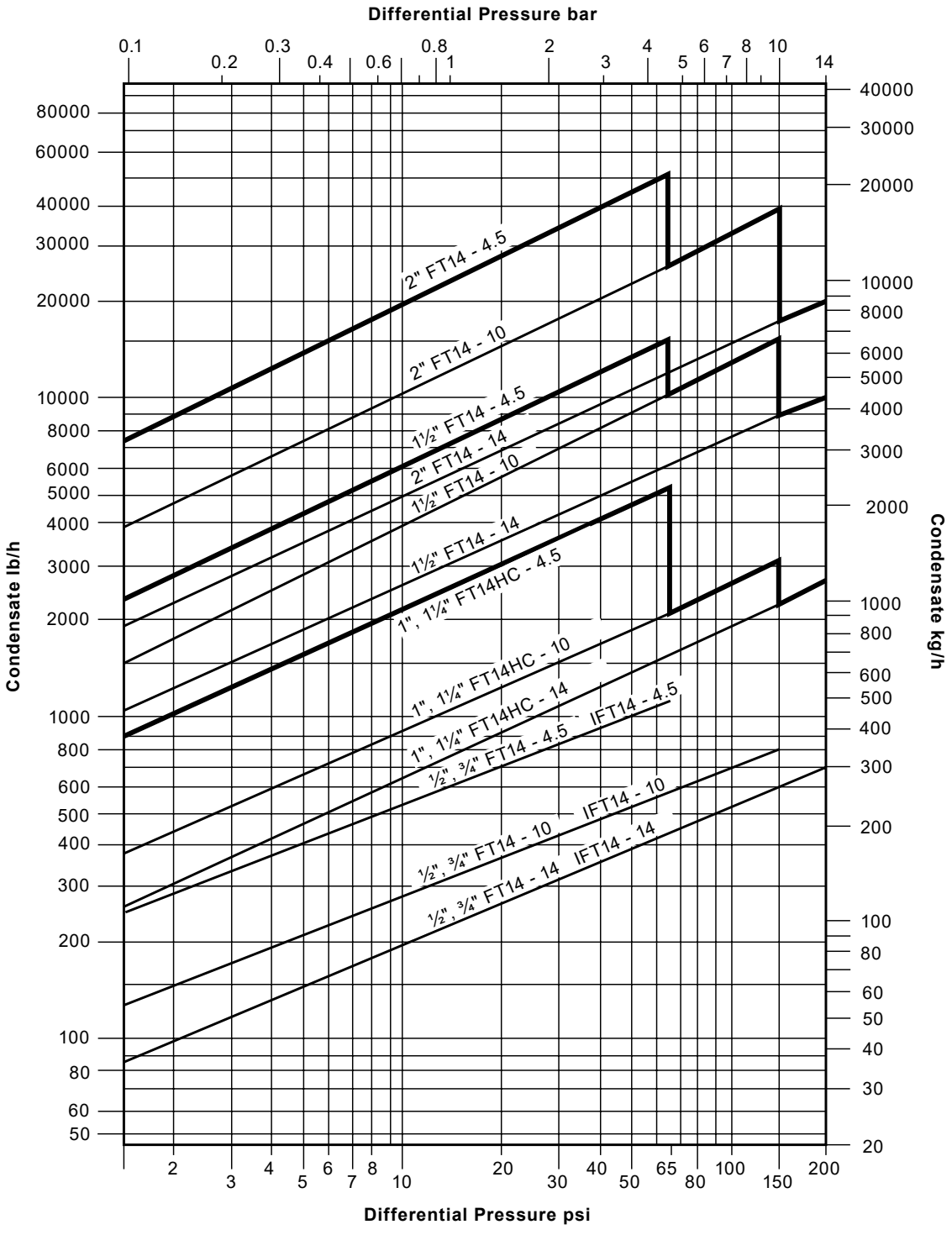
***Note:** Reduced A/F bolt head required



TI-S02-28-US
Issue 2

Float and Thermostatic Steam Trap
FT14, IFT14, 1"FT14HC

Capacities in lb/h (kg/h) hot condensate



TI-P026-02-US
Issue 2

Cast Steel Float and Thermostatic Steam Trap FT450

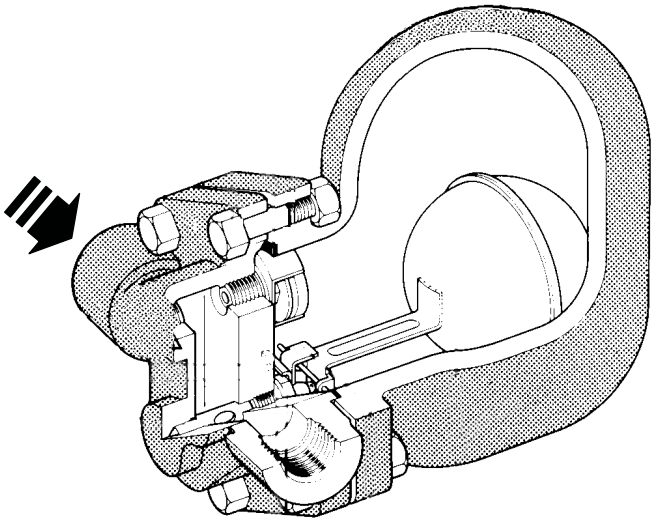
Description

The trap contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature, while non-condensible gases are released by a separate internal balanced pressure thermostatic air vent.

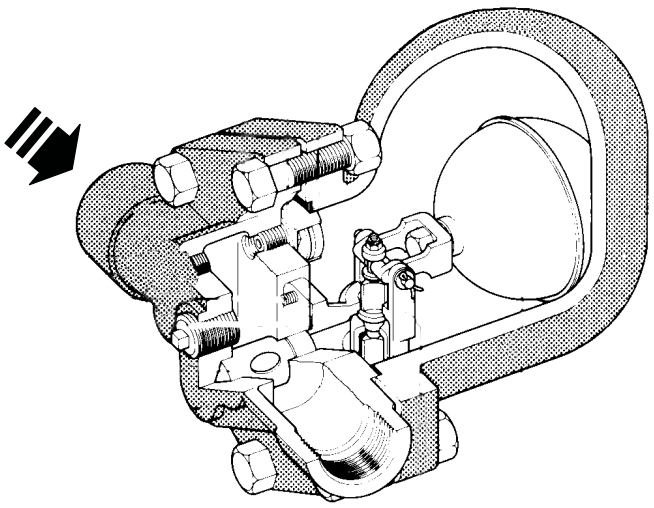
Model	**FT 450 (Replaces FT 32)**
PMO	465 psi g (limiting operating conditions, on page 2)
Sizes	¾" to 2"
Connections	NPT Carbon Steel Body
Construction	Stainless Steel Internals
Options	ANSI 150, 300 or 600 RF flanged SW Connections to ANSI B16.11 Bimetal Air Vent on 4.5, 10, 14, 21 and 32 models for superheat operation Drain plug tapped ½" NPT

Typical applications

All process equipment, particularly when controlled by modulating temperature control valves; unit heaters, air heating coils, heat exchangers and steam main drip stations.



1½" and 2"



¾" and 1"

Limiting operating conditions*

PMO	Maximum Operating Pressure	FT450-4.5:	65 psi g	(4.5 bar g)
		FT450-10:	145 psi g	(10 bar g)
		FT450-14:	200 psi g	(14 bar g)
		FT450-21:	300 psi g	(21 bar g)
		FT450-32:	465 psi g	(32 bar g)
Maximum Operating Temperature See graph for thermostatic air vent		Bimetal optional air vent 750 °F (400 °C) at operating pressures below 505 psi g (35 bar g)		

Product is safe for use under full vacuum conditions.

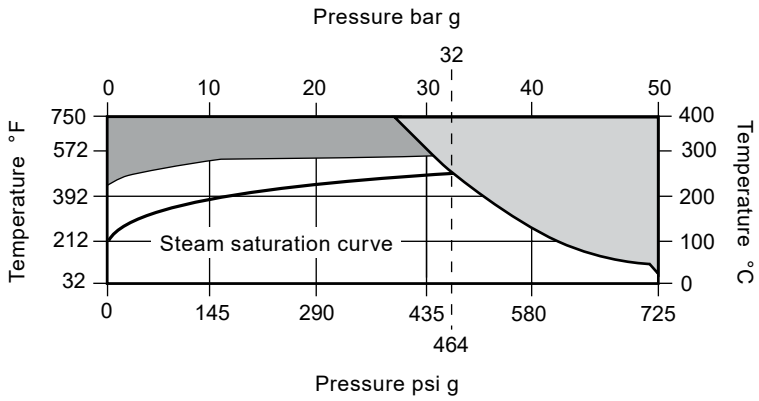
Pressure shell design conditions

For NPT, SW, ANSI 300, ANSI 600*

PMA	Maximum allowable pressure	535 psi g @ 650 °F (37 bar g @ 343 °C)
		505 psi g @ 750˚F (35 bar g @ 400 °C)
TMA	Maximum allowable temperature	750 °F @ 0-505 psi g (400 °C @ 0-35 bar g)

* The limiting operating and design conditions for ANSI 150 flanged units will be limited by the Flange Rating.

Thermostatic air vent operating range



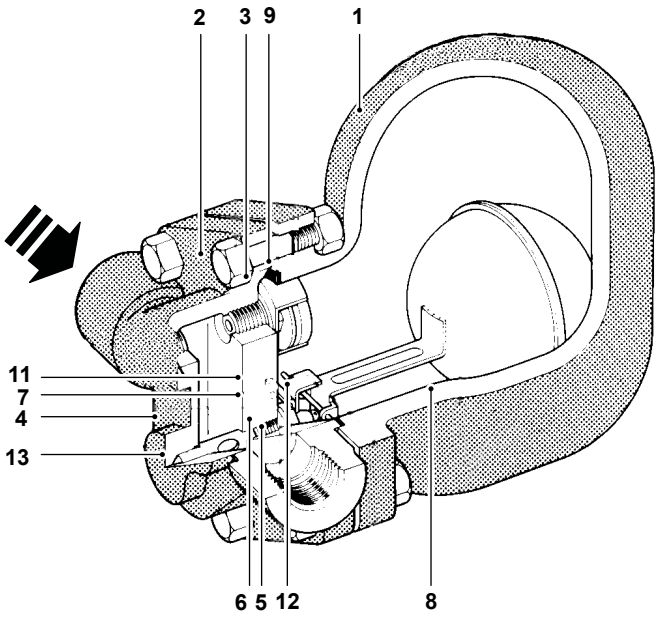
The product **must not** be used in this region.

Bimetal air vent required for use in this range.

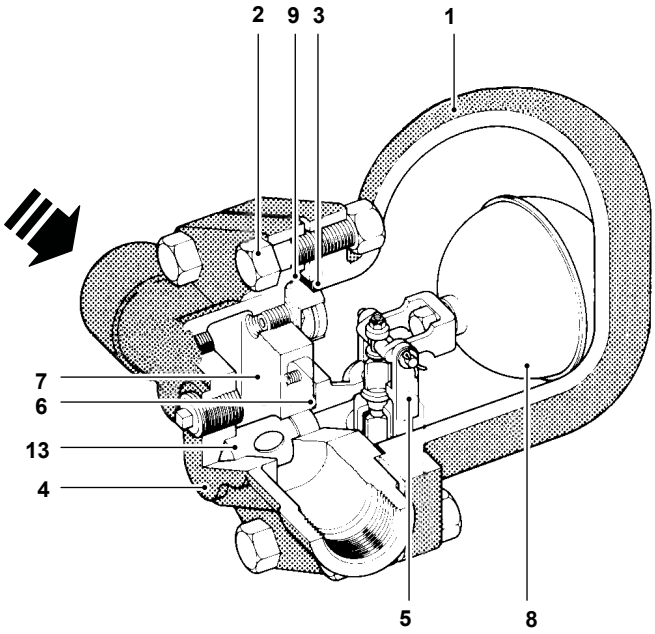
Capacities

See TI-S02-55-US

Materials



¾" and 1"

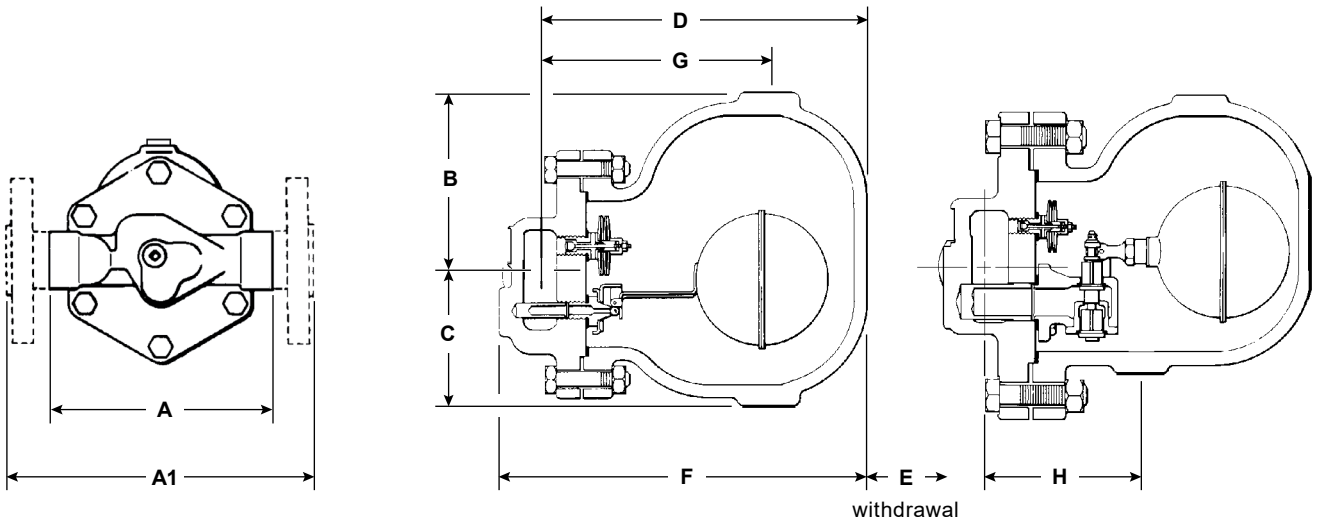


1½" and 2"

No.	Part		Material	
1	Body		Cast Steel	ASTM A216 WCB
2	Cover Bolts		Alloy Steel	ASTM A 193 B7
	Cover Nuts	¾" and 1"	7/16 - 14 UNC-2A	ASTM A 194 2H
		1½" and 2"	5/8-11UNC-2A	
3	Cover Gasket		Exfoliated Graphite	
4	Cover		Cast Steel	ASTM A216 WCB
5	Valve Seat (¾" and 1")		Stainless Steel	
	Main Valve Assembly w/ erosion deflector (1½" and 2")		Stainless Steel	
6	Valve Seat Gasket (¾" and 1")		Stainless Steel	
	Main Valve Assy		Stainless Steel Reinforced Exfoliated Graphite	
	Gasket 1½" and 2"			

No.	Part	Material
7	Pivot Frame Assy	Stainless Steel
	Set Screws (¾" and 1")	10-24 Fillister Head
	Main Valve Assembly	Stainless Steel
	Cap Screws (1½")	¼-20
	Studs and Nuts (2")	5/16-18
8	Ball Float and Lever	Stainless Steel
9	Air Vent Assembly	Standard Stainless Steel
9A	Optional Bimetal	Corrosion resistant Bimetal and Stainless Steel
10	Air Vent Seat Gasket	Stainless Steel
11	Support Frame	Stainless Steel
12	Pivot Frame	Stainless Steel
13	Erosion Deflector	Stainless Steel

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Size DN	Dimensions									Weights	
	A	A1	B	C	D	E	F	G	H	NPT/SW	Flg
¾" (20	6.1 (155)	10.0 (254)	2.6 (66)	2.6 (66)	6.4 (163)	4.7 (119)	7.4 (188)	4.0 (102)	-	18.0 lb (8.2 kg)	23.8 lb (10.8 kg)
1" (25	6.5 (165)	10.4 (264)	4.5 (114)	3.3 (84)	8.2 (208)	6.3 (160)	9.2 (234)	5.8 (147)	-	28.0 lb (12.7 kg)	33.0 lb (15.0 kg)
1½" (40	9.8 (249)	14.0 (356)	5.1 (130)	3.1 (79)	9.7 (246)	7.7 (196)	11.0 (279)	6.4 (163)	4.7 (119)	55.1 lb (25.0 kg)	64.0 lb (29.0 kg)
2" (50	11.8 (300)	16.0* (406)*	5.5 (140)	3.6 (91)	9.9 (251)	7.7 (196)	11.5 (292)	6.5 (165)	6.0 (152)	68.0 lb (31.0 kg)	82.0 lb (37.2 kg)

*ANSI 600 16.5" 419 mm

Sample specification

Steam traps shall be of the mechanical ball float type having steel bodies, horizontal line connections, and stainless steel valve heads, seats and ball floats. Incorporated into the trap body shall be a stainless steel balanced pressure thermostatic air vent capable of withstanding 45 ˚F (25 °C) of superheat and resisting waterhammer without sustaining damage. Internals of the trap shall be completely servicable without disturbing the piping.

Installation

A pipeline strainer should be installed ahead of any steam trap. Full port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap, in a position so that the float arm is in a horizontal plane and the float rises and falls vertically, with the flow direction as indicated on the body. Refer to IMI 2.300 for complete instructions.

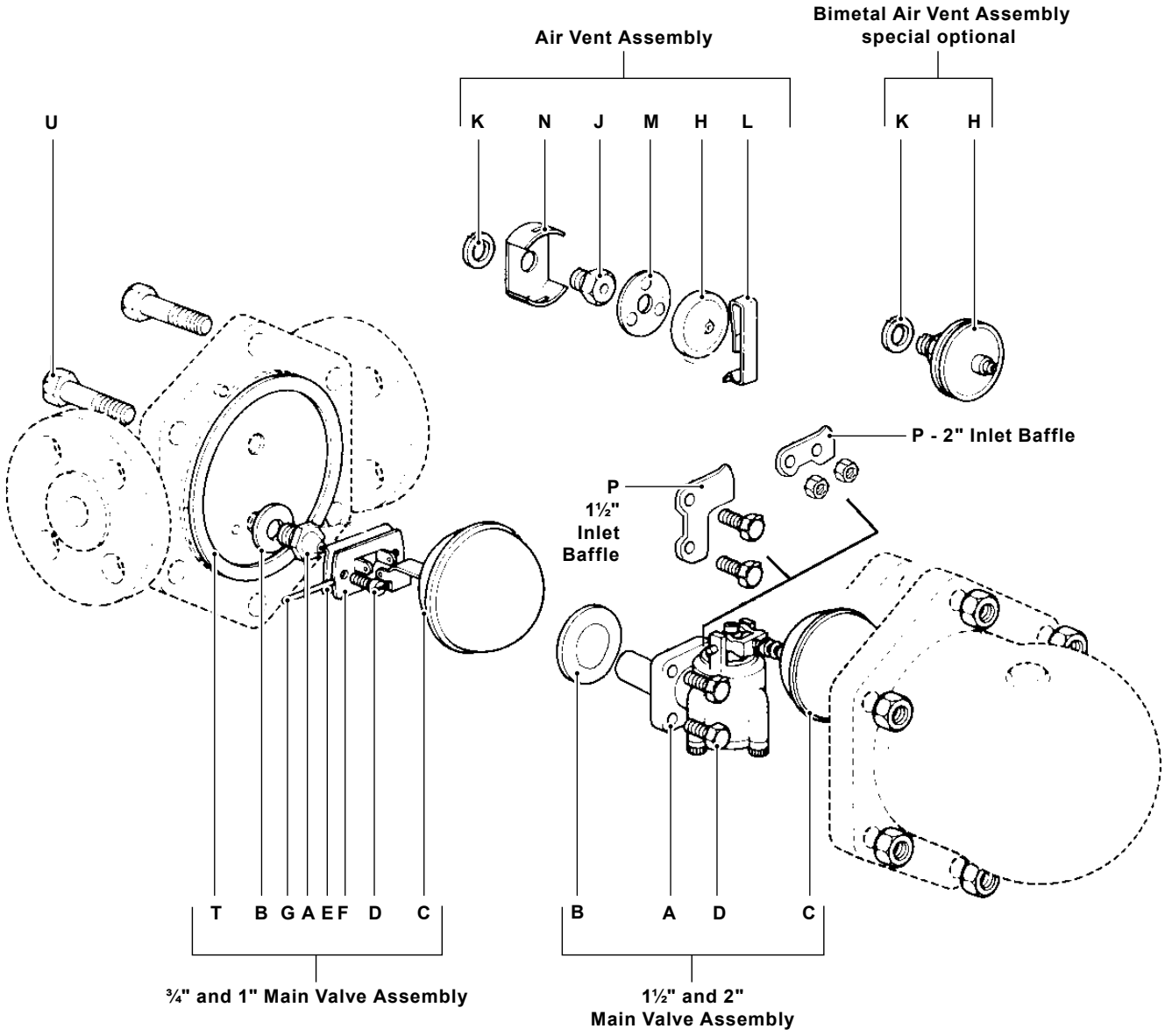
Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed. The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, operating mechanism and air vent.
Worn or damaged parts should be replaced using a complete valve mechanism assembly and/or air vent assembly.

Complete installation and maintenance instructions are given in IMI 2.300, which accompanies the product.

Spare parts

Valve Mechanism Kit with Float (¾" and 1")	**A,B,C,D,E,F,G**
Valve Mechanism Kit (1½" and 2")	**A,B,D,P**
Air Vent Kit (PMO up to 21 bar)	**H,J,L,M,N**
Air Vent Kit (PMO 32 bar)	**H,K**
Gasket Kit (3 of each)	**B,K,T**
Ball Float (1½"and 2")	**C**

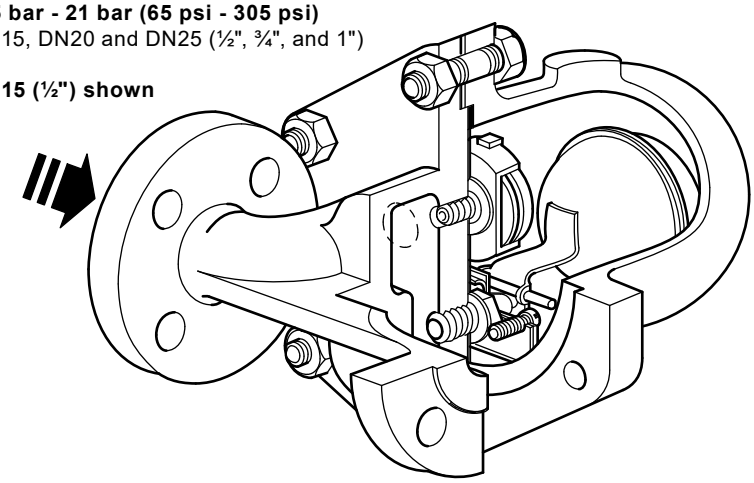


TI-P143-01
CMGT Issue 15

FT46
Stainless Steel
Ball Float Steam Traps DN15 to DN50 (½" to 2")

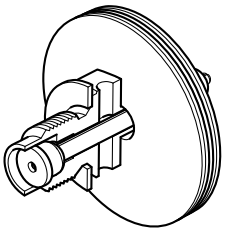
FT46
4.5 bar - 21 bar (65 psi - 305 psi)
DN15, DN20 and DN25 (½", ¾", and 1")

DN15 (½") shown

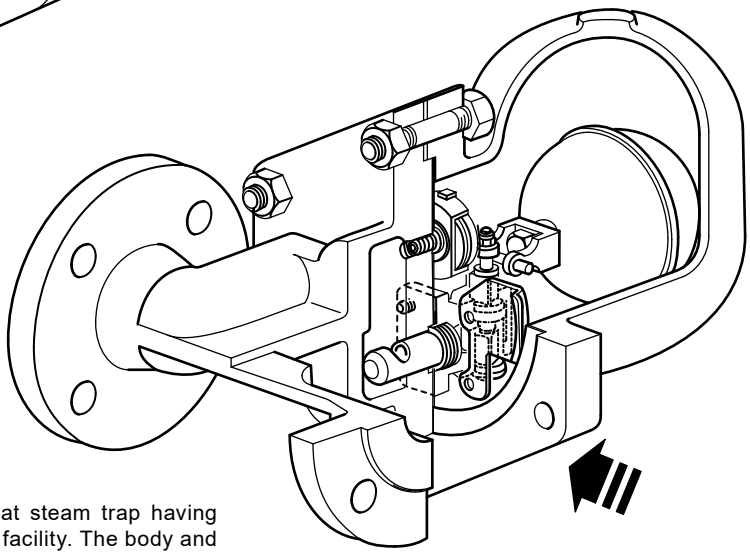


FT46
DN15 to DN50
(½" to 2")

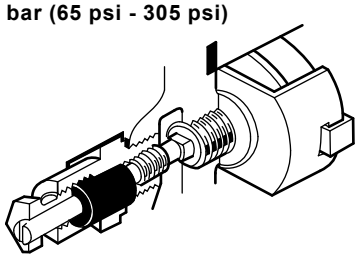
32 bar



FT46
4.5, 10 and 21 bar (65, 145, and 305 psi)
DN40 and DN50 (1½" and 2")
DN50 (2") shown



FT46-C
4.5-21 bar (65 psi - 305 psi)



Description

The FT46 is an austenitic stainless steel bodied ball float steam trap having stainless steel working internals and automatic air venting facility. The body and cover castings are produced by a TÜV approved foundry. The trap is supplied with integrally flanged connections and can be maintained without disturbing the pipework. Flow direction for the horizontal trap is clearly illustrated above.

Air vent

The BP99/32 capsule which is used in the FT46 is suitable for use on 150 °C (302 °F) superheat @ 0 bar g. This value reduces with elevated pressure.
The bimetallic element is fitted as standard to the 32 bar (464 psi) variants to provide additional superheat resistance. It is also available on other variants on request. Please refer to the Pressure/temperature limits graph on page 2.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU and carries the CE mark when so required.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Optional extras

A **manually adjustable needle valve** (designated '**C**' on the nomenclature i.e. **FT46-C**) can be fitted to the trap. This option provides a **steam lock release (SLR)** feature in addition to the standard air vent.
Note: The SLR and bimetallic air vent cannot be used in conjunction with each other. Alternative arrangements may be available. For further information please consult Spirax Sarco.
The **top of the cover can be drilled and tapped ⅜" BSP T Rp (ISO 7-1) or NPT** for the purpose of fitting a balance line if requested at the point of order.
The **bottom of the cover can be drilled and tapped ⅜" BSP T Rp (ISO 7-1) or NPT** for the purpose of fitting a drain cock if requested at the point of order.

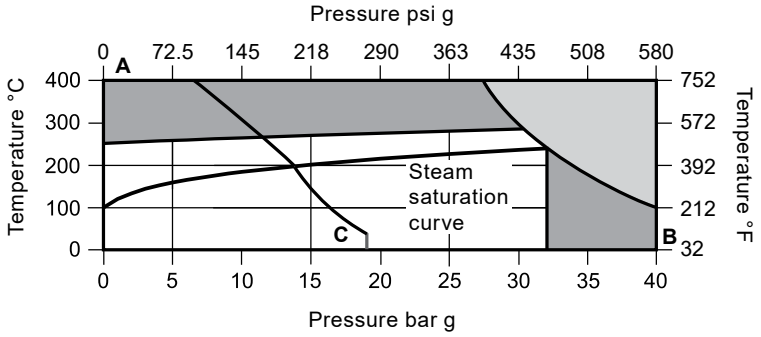
Sizes and pipe connections

DN15, DN20, DN25, DN40 and DN50 (½", ¾", 1", 1½" and 2").

Note: Flow direction when facing the body: **-** DN15 to DN25 (½" to 1") is left to right. **-** DN40 and DN50 (1½" and 2") is right to left.

Standard flanges are EN 1092 PN40 with face-to-face dimensions in accordance with EN 26554 (Series 1).
On request - ASME (ANSI) B 16.5 Class 150 and 300 flanges are available with face-to-face dimensions in accordance with EN 26554 (Series 1).
Note: ASME (ANSI) flanges are supplied with tapped (UNC) holes for flange bolts.

Pressure/temperature limits



The product **must not** be used in this region.

This product should not be used in this region as damage to the air vent may occur.

A - B Flanged EN 1092 PN40 and ASME (ANSI) 300.

A - C Flanged ASME (ANSI) 150.

Note: The use of the bimetallic element extends the superheat resistance to in excess of 400 °C (752 °F).

Body design conditions				
PMA	Maximum allowable pressure		40 bar g @ 100 °C	580 psi g @ 212 °F
TMA	Maximum allowable temperature		400 °C @ 27.4 bar g	752 °F @ 397 psi g
Minimum allowable temperature			-10 °C	14 °F
PMO	Maximum operating pressure for saturated steam service		32 bar g @ 239 °C	464 psi g @ 462 °F
TMO	Maximum operating temperature	When fitted with a capsule	285 °C @ 30.3 bar g	545 °F @ 439 psi g
		When fitted with a bimetallic air vent	400 °C @ 27.4 bar g	752 °F @ 397 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F

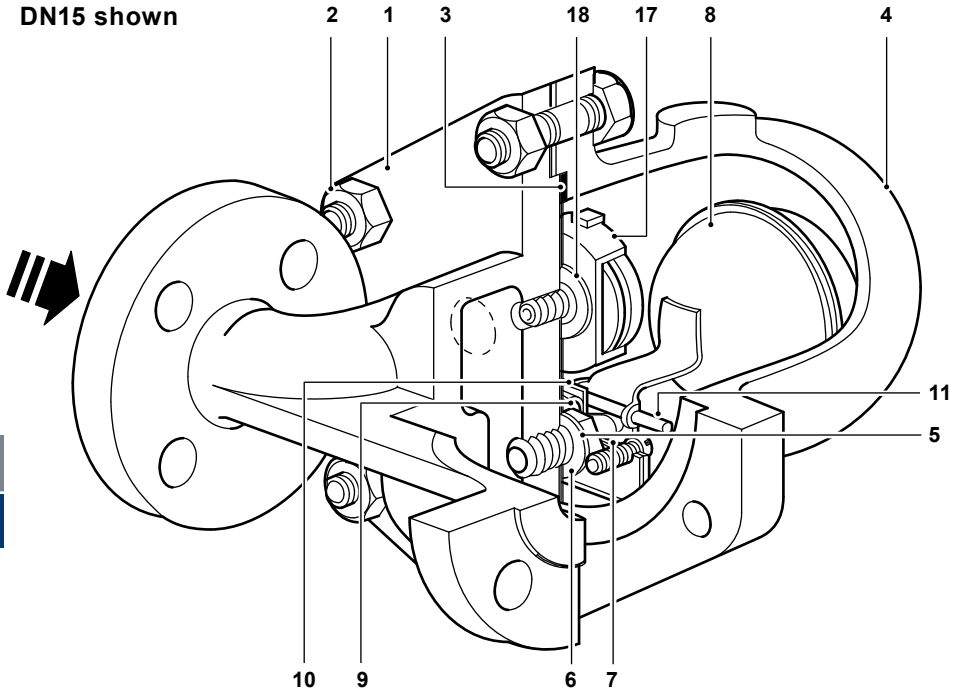
		Size	**DN15 DN20 DN25**	**½" ¾" 1"**	**DN40 DN50**	**1½" 2"**
Δ PMX	Maximum differential pressure	**FT46-4.5**	4.5 bar	65 psi	4.5 bar	65 psi
		FT46-10	10 bar	145 psi	10 bar	145 psi
		FT46-14	14 bar	203 psi	-	-
		FT46-21	21 bar	305 psi	21 bar	305 psi
		FT46-32	32 bar	464 psi	32 bar	464 psi

Product is safe for use under full vacuum conditions		
Designed for a maximum cold hydraulic test pressure:	60 bar g	870 psi g
Note: With internals fitted, test pressure must not exceed:	48 bar g	696 psi g

Caution: The trap in its complete operational form must not be subjected to a pressure greater than 48 bar (696 psi) otherwise damage to the internal mechanism may result.

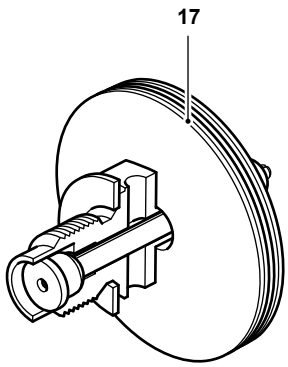
Materials - FT46 4.5 bar - 21 bar DN15, DN20 and DN25

DN15 shown



FT46
DN15 to DN50

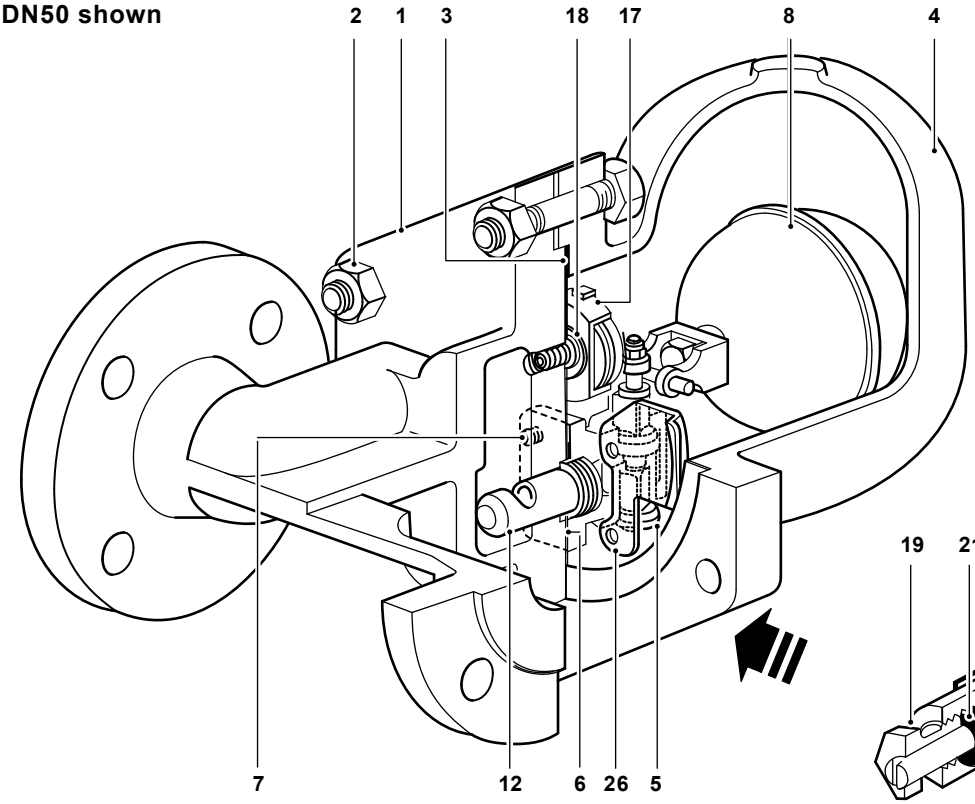
32 bar



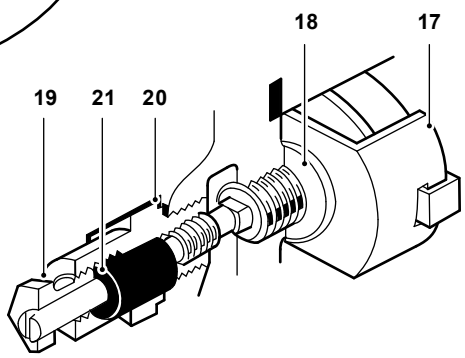
No.	Part		Material		
1	Body		Austenitic stainless steel (316)		1.4408/CF8M
2	Cover studs		Austenitic stainless steel		A2.70
	Cover nuts		Austenitic stainless steel		A4
3	Cover gasket		Reinforced exfoliated graphite		
4	Cover		Austenitic stainless steel (316)		1.4408/CF8M
5	Valve seat		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 970 431 S29
	Main valve assembly		DN40 and DN50 (1½" and 2")	Stainless steel	BS 3146 Pt2 ANC2 BS 970 416 S37
6	Valve seat gasket		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 1449 304 S11
	Main valve assembly gasket		DN40 and DN50 (1½" and 2")	Reinforced exfoliated graphite	
7	Pivot frame assembly set screws		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 4183 18/8
	Main valve assembly	Bolts	DN40 (½")	Stainless steel	BS 970 304 S15
		Studs and nuts	DN50 (¾")	Stainless steel	BS 6105 A4.80
8	Ball float and lever			Stainless steel	BS 1449 304 S16
9	Support frame		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 1449 304 S16
10	Pivot frame		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 1449 304 S16
11	Pivot pin		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	
17	Air vent assembly for all pressure ratings			Stainless steel	
18	Air vent seat gasket			Stainless steel	BS 1449 409 S19

Materials - FT46 4.5, 10 and 21 bar DN40 and DN50

DN50 shown

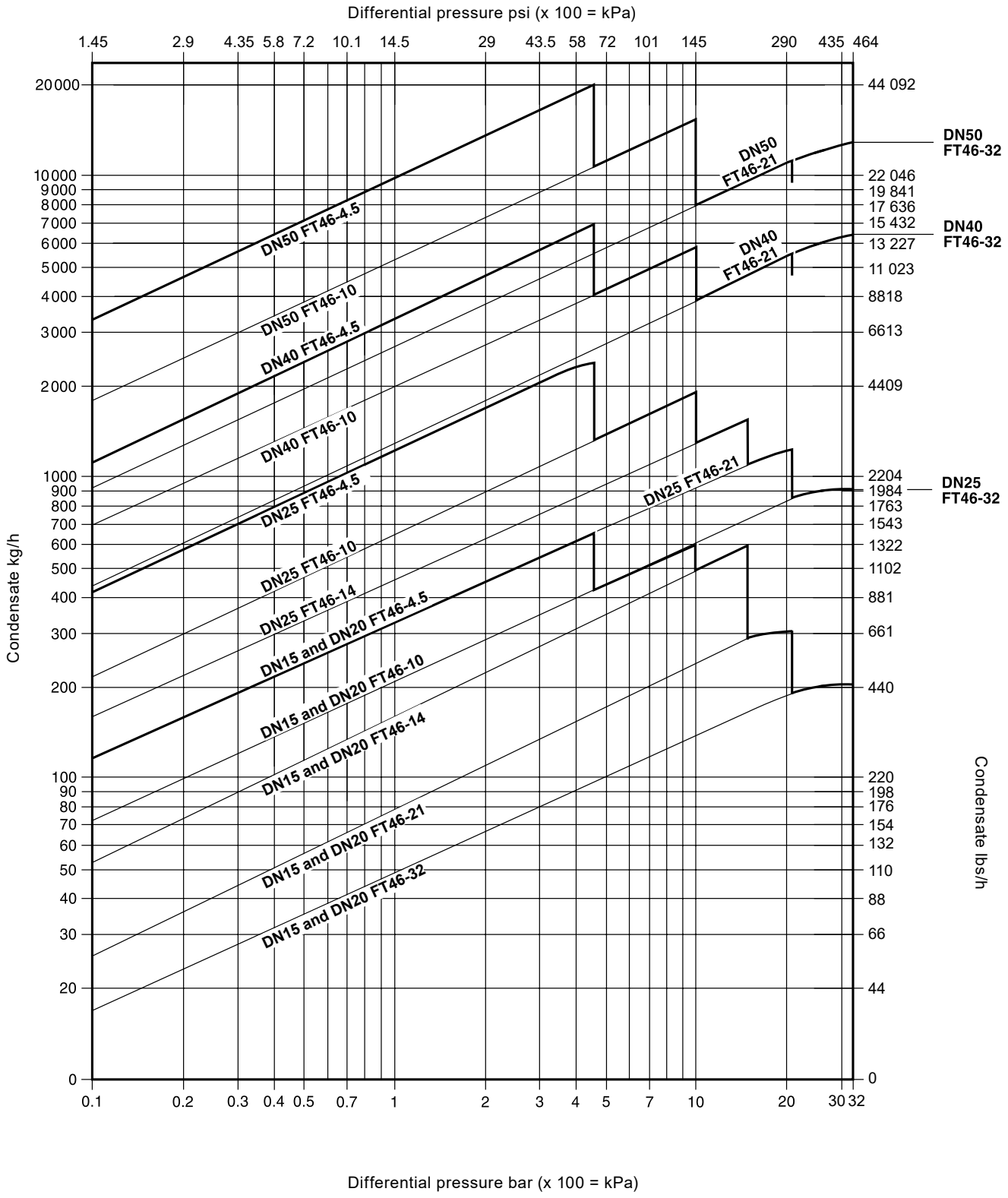


FT46-C 4.5-21 bar



No.	Part		Material		
1	Body		Austenitic stainless steel (316)		1.4408/CF8M
2	Cover studs		Austenitic stainless steel		A2.70
	Cover nuts		Austenitic stainless steel		A4
3	Cover gasket		Reinforced exfoliated graphite		
4	Cover		Austenitic stainless steel (316)		1.4408/CF8M
5	Valve seat		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 970 431 S29
	Main valve assembly		DN40 and DN50 (1½" and 2")	Stainless steel	BS 3146 Pt2 ANC2 BS 970 416 S37
6	Valve seat gasket		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 1449 304 S11
	Main valve assembly gasket		DN40 and DN50 (1½" and 2")	Reinforced exfoliated graphite	
7	Pivot frame assembly set screws		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 4183 18/8
	Main valve assembly	Bolts	DN40 (½")	Stainless steel	BS 970 304 S15
		Studs and nuts	DN50 (¾")	Stainless steel	BS 6105 A4.80
8	Ball float and lever			Stainless steel	BS 1449 304 S16
9	Support frame		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 1449 304 S16
10	Pivot frame		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	BS 1449 304 S16
11	Pivot pin		DN15, DN20 and DN25 (½", ¾" and 1")	Stainless steel	
12	Erosion deflector			Stainless steel	BS 970 431 S29
17	Air vent assembly for all pressure ratings			Stainless steel	
18	Air vent seat gasket			Stainless steel	BS 1449 409 S19
19	SLR assembly			Stainless steel	BS 970 303 S31
20	SLR gasket			Stainless steel	BS 1449 304 S11
21	SLR seal			Graphite	
26	Inlet plate		DN40 and DN50 (1½" and 2") only	Stainless steel	BS 1449 304 S16

Capacities


Differential pressure psi (x 100 = kPa)
1.45 2.9 4.35 5.8 7.2 10.1 14.5 29 43.5 58 72 101 145 290 435 464
20000 10000 9000 8000 7000 6000 5000 4000 3000 2000 1000 900 800 700 600 500 400 300 200 100 90 80 70 60 50 40 30 20 0
44 092 22 046 19 841 17 636 15 432 13 227 11 023 8818 6613 4409 2204 1984 1763 1543 1322 1102 881 661 440 220 198 176 154 132 110 88 66 44 0
DN50 FT46-32
DN40 FT46-32
DN25 FT46-32
DN50 FT46-4.5
DN50 FT46-21
DN50 FT46-10
DN40 FT46-4.5
DN40 FT46-21
DN40 FT46-10
DN25 FT46-4.5
DN25 FT46-21
DN25 FT46-10
DN25 FT46-14
DN15 and DN20 FT46-4.5
DN15 and DN20 FT46-10
DN15 and DN20 FT46-14
DN15 and DN20 FT46-21
DN15 and DN20 FT46-32
Condensate kg/h
Condensate lbs/h
0.1 0.2 0.3 0.4 0.5 0.7 1 2 3 4 5 7 10 20 30 32
Differential pressure bar (x 100 = kPa)

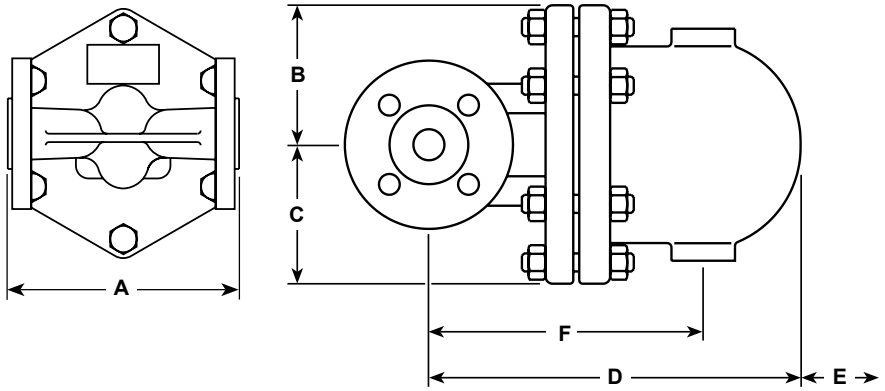
Additional cold water capacities from the thermostatic air vent under start-up conditions

Capacities shown above are based on condensate at saturation temperature. Under start-up conditions when the condensate is cold the internal thermostatic air vent will be open and provides additional capacity to the main valve.

The following table gives the minimum additional cold water capacities from the air vent.

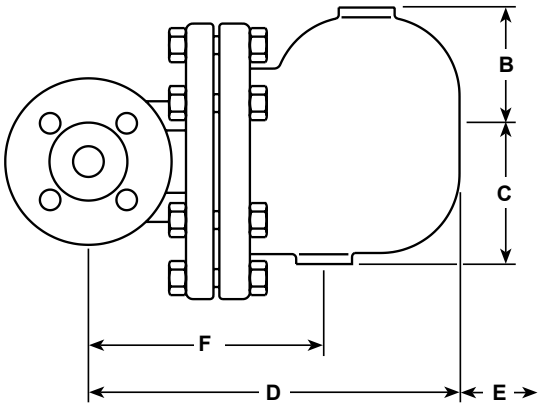
ΔP (bar)		0.5 (7)	1 (15)	2 (29)	3 (44)	4.5 (65)	7 (102)	10 (145)	14 (203)	21 (305)	32 (464)
		Minimum additional cold water capacity in kg/h (lb/h)									
DN15 and DN20	up to 21 bar	450 (992)	600 (1323)	780 (1720)	1040 (2293)	1140 (2513)	1350 (2976)	1530 (3373)	1750 (3858)	2300 (5071)	-
	32 bar only	170 (375)	250 (551)	380 (838)	520 (1146)	600 (1323)	780 (1720)	860 (1896)	1140 (2513)	1170 (2579)	1200 (2646)
DN25, DN40 and DN50	up to 21 bar	460 (1014)	680 (1499)	900 (1984)	1080 (2381)	1300 (2866)	1600 (3527)	1980 (4365)	2050 (4519)	2600 (5732)	-
	32 bar only	90 (198)	120 (264)	350 (772)	460 (1014)	600 (1323)	850 (1874)	900 (1984)	1020 (2249)	1200 (2646)	1300 (2866)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



FT46

DN15 and DN20
(½" and ¾")



FT46

DN25, DN40 and DN50
(1", 1½" and 2")

Size	A	B	C	D	E	F	Weight
DN15	150 (5.91)	80 (3.15)	80 (3.15)	215 (8.46)	120 (4.72)	155 (6.10)	10.8 (23.8)
DN20						165 (6.50)	10.8 (23.8)
DN25	160 (6.30)	115 (4.53)	85 (3.35)	276 (10.9)	170 (6.69)	215 (8.46)	15.0 (33.1)
DN40	230 (9.06)	130 (5.12)	80 (3.15)	326 (12.8)	200 (7.87)	200 (7.87)	33.0 (72.8)
DN50		141 (5.55)	91 (3.58)	332 (13.1)		236 (9.29)	43.0 (94.8)

Face-to-face dimensions in accordance with EN 26554 (Series 1)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-S02-30) supplied with the product.

Installation note:

The FT46 must be installed with the direction of flow as indicated on the body, and with the float arm in a horizontal plane so that it rises and falls vertically.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

How to order

Note: Although FT46 4.5 bar - 21 bar (65 psi - 305 psi) versions are fitted with a capsule air vent assembly as standard, they can be fitted with a bimetallic air vent assembly upon request.
Example: 1 off Spirax Sarco DN25 FT46-21 ball float steam trap, having an austenitic stainless steel body and cover with a bimetallic air vent assembly. Connections are to be flanged to EN1092 PN40.

Note: Although the FT46 32 bar (464 psi) is fitted with a bimetallic air vent assembly as standard, it can be fitted with a capsule air vent assembly and steam lock release feature upon request.
Example: 1 off Spirax Sarco DN25 FT46-21 ball float steam trap, having an austenitic stainless steel body and cover with a capsule air vent assembly. Connections are to be flanged to EN1092 PN40.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

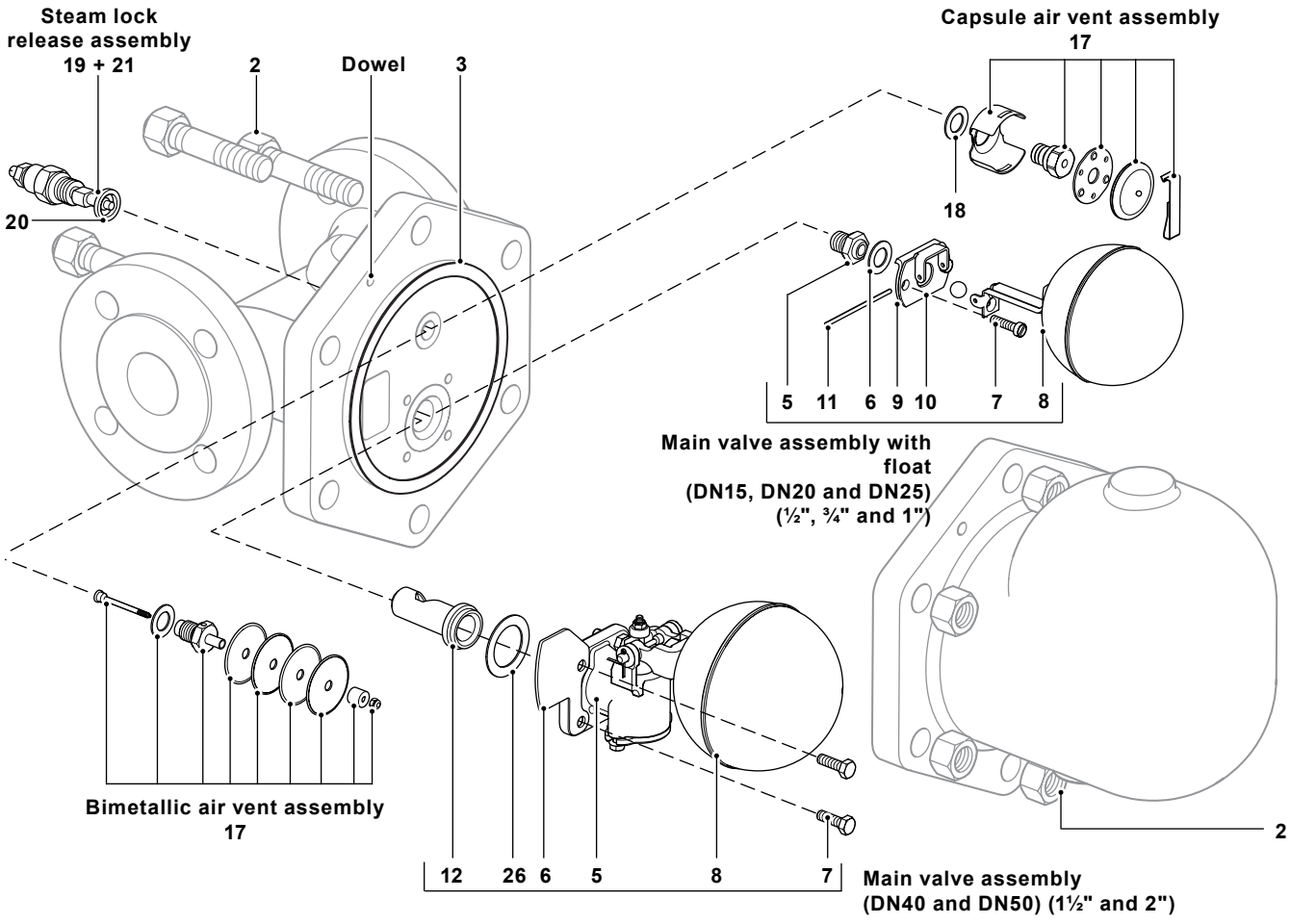
Available spares

Main valve assembly with float	DN15, DN20, and DN25 (½", ¾" and 1")	**5, 6, 7, 8, 9, 10, 11**
Main valve assembly	DN40 and DN50 (1½" and 2")	**5, 6, 7, 12, 26**
Ball float	DN40 and DN50 (1½" and 2")	**8**
Air vent assembly	Bimetallic air vent assembly	**17, 18**
	Capsule air vent assembly	
Steam lock release and capsule air vent assembly (FT46-C)		**17, 18, 19, 20, 21**
Complete set of gaskets (packet of 3 sets)		**3, 6, 18, 20, 21**

Note: Item 12 (Erosion deflector) is only used in DN40 and DN50 (1½" and 2").

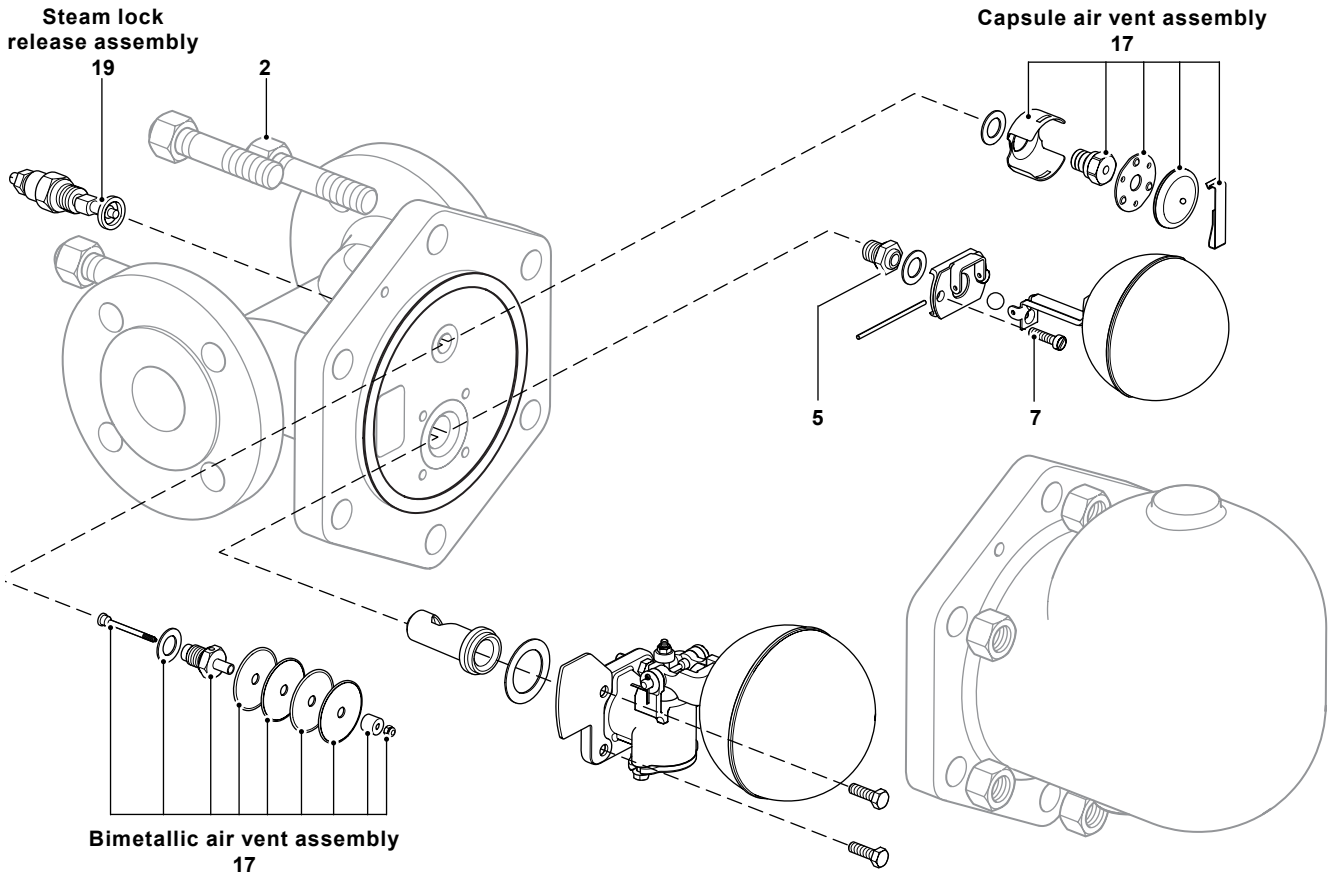
How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap, including pressure range.
Example: 1 - Capsule air vent assembly for a Spirax Sarco DN20 FT46-4.5 ball float steam trap.



For Recommended tightening torques, see next page

Recommended tightening torques

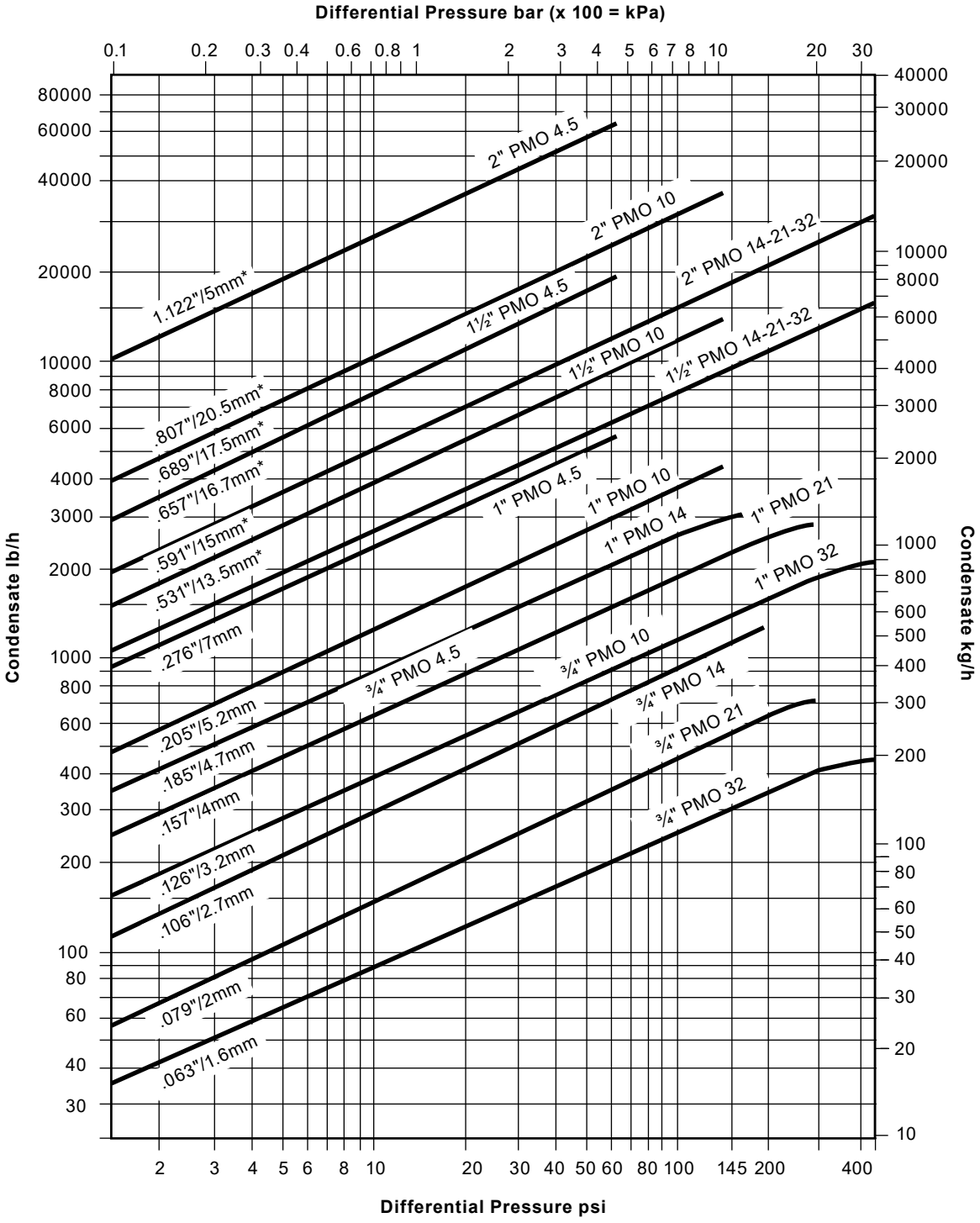


Item	Size	or mm		N m	(lbf ft)
2	DN15, 20 and 25	17 A/F	M10 x 60	19 - 22	(14-16)
	DN40	19 A/F	M16 x 85	60 - 66	(44-47)
	DN50	24 A/F	M16 x 85	80 - 88	(59-65)
5	DN15, 20 and 25	17 A/F		50 - 55	(37-41)
7	DN15, 20 and 25		M5 x 20	2.5 - 2.8	(1-2)
	DN40	10 A/F	M6 x 20	10 - 12	(7-9)
	DN50	13 A/F	M8 x 20	20 - 24	(15-18)
17		17 A/F		50 - 55	(37-41)
19		22 A/F			

TI-S02-55-US
Issue 1

Float and Thermostatic Steam Trap Capacities FT46, FT450

Capacities in lb/hr (kg/h) hot condensate



FT46 Capacities
4.5, 10, 14, 21 only

FT450 Capacities
1½" & 2"
4.5, 10, 32 bar only

FT450
¾" & 1"
All Capacities

* Each orifice of a double-seated mechanism

Capacities in lb/hr (kg/h) hot condensat

Model	Size	Orifice		Differential Pressure, psi				
		inches	mm	¼	½	1	2	5
FT14-4.5	½", ¾"	.157	4	115	155	205	265	390
FT14-10	½", ¾"	.110	2.8	56	76	100	137	200
FT14-14	½", ¾"	.079	2	40	53	71	95	138
FT14-4.5	1"	.276	7	374	529	748	1058	1566
FT14-10	1"	.205	5.2	163	230	325	459	695
FT14-14	1"	.157	4	109	154	218	309	441
FT14-4.5	1-½"	.689*	17.5*	975	1378	1949	2756	4388
FT14-10	1-½"	.591*	15*	608	860	1216	1720	2700
FT14-14	1-½"	.531*	13.5*	394	557	788	1114	1764
FT14-4.5	2"	1.122*	28.5*	3196	4520	6392	9040	14332
FT14-10	2"	.807*	20.5*	1637	2315	3274	4630	7166
FT14-14	2"	.657*	16.7*	780	1102	1559	2205	3418
FT450-4.5	¾"	.157	4	110	155	219	310	440
FT450-10	¾"	.126	3.2	65	91	129	183	275
FT450-14	¾"	.106	2.7	47	66	93	132	203
FT20-21 FT450-21	½" ¾"	.079	2.0	25	35	50	70	110
FT450-32	¾"	.063	1.6	16	22	31	44	66
FT450-4.5	1"	.276	7	389	550	778	1100	1655
FT450-10	1"	.205	5.2	202	285	403	570	870
FT450-14	1"	.185	4.7	150	212	300	425	640
FT450-21	1"	.157	4	110	155	219	310	440
FT450-32	1"	.126	3.2	65	91	129	183	275
FT450-4.5	1-½"	.689*	17.5*	1209	1710	2418	3420	5733
FT450-10	1-½"	.591*	15*	624	882	1247	1764	2734
FT450-14/21/32	1-½"	.531*	13.5*	407	575	813	1150	1764
FT450-4.5	2"	1.122*	28.5*	4289	6065	8577	12130	18522
FT450-10	2"	.807*	20.5*	1559	2205	3118	4410	6950
FT450-14/21/32	2"	.657*	16.7*	780	1103	1559	2705	3528

* each orifice of double seated trap

Note: for FT32 and FT46, use capacities for FT450.

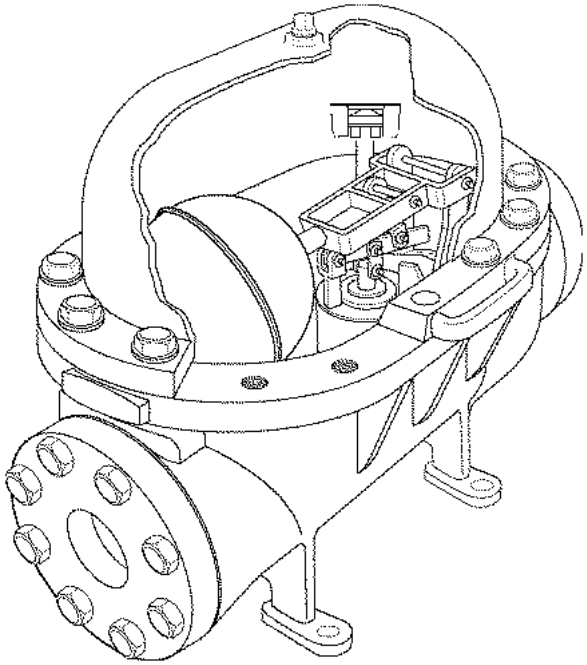
TI-P026-01-US
Issue 2

Cast Steel Float and Thermostatic Steam Trap 3'' (DN80) and 4'' (DN100) FT450

Description

The trap contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature, while non-condensible gases are released by a separate internal thermostatic air vent.

Model	FT450	
PMO	450 psi g (31 bar g)	
Sizes	3" (DN80)	4" (DN100)
Connections	NPT, SW, Flanged	Flanged
Construction	Carbon steel body Stainless steel internals	



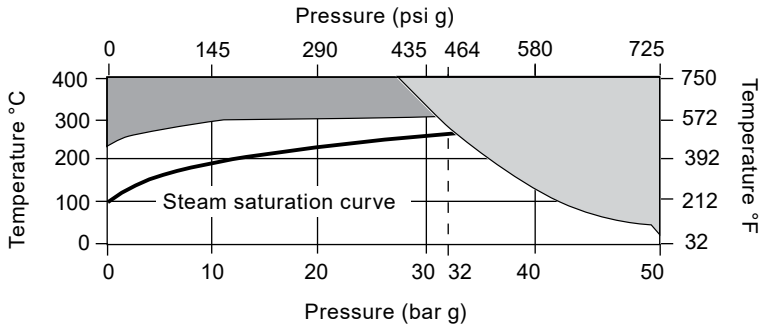
Typical applications

- Reboilers, heat exchangers and other large process equipment
- Large absorption chillers
- In combination with the Spirax Sarco 4" (DN100) Pressure Powered Pump™

Certification

This product is available with certification to EN 10204 3.1. Designed in accordance with ASME VIII Div 1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Pressure/temperature limits



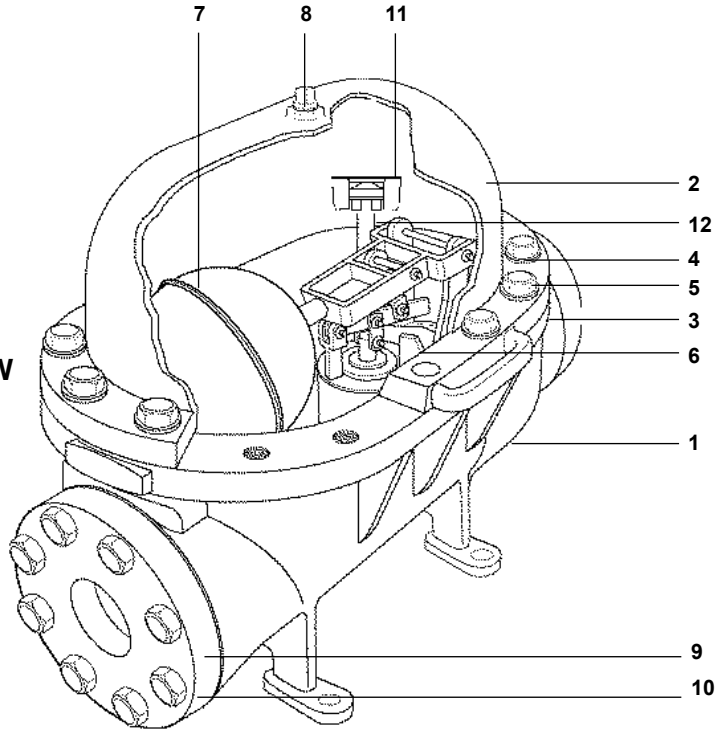
The product **must not** be used in this region.

Use bi-metal air vent

Maximum operating pressure		450 psi g	31 bar g
			Optional Bimetal
Maximum operating temperature		650 °F @ 450 psi g	343 °C @ 31 bar g
		750 °F @ up to 375 psi g	400 °C @ up to 26 bar g
		450 psi g @ up to 650 °F	31 bar g @ up to 343 °C
PMA	Maximum allowable pressure	425 psi g @ 700 °F	29 bar g @ 371 °C
		375 psi g @ 750 °F	26 bar g @ 400 °C
TMA	Maximum allowable temperature	750 °F @ 375 psi g	400 °C @ 26 bar g

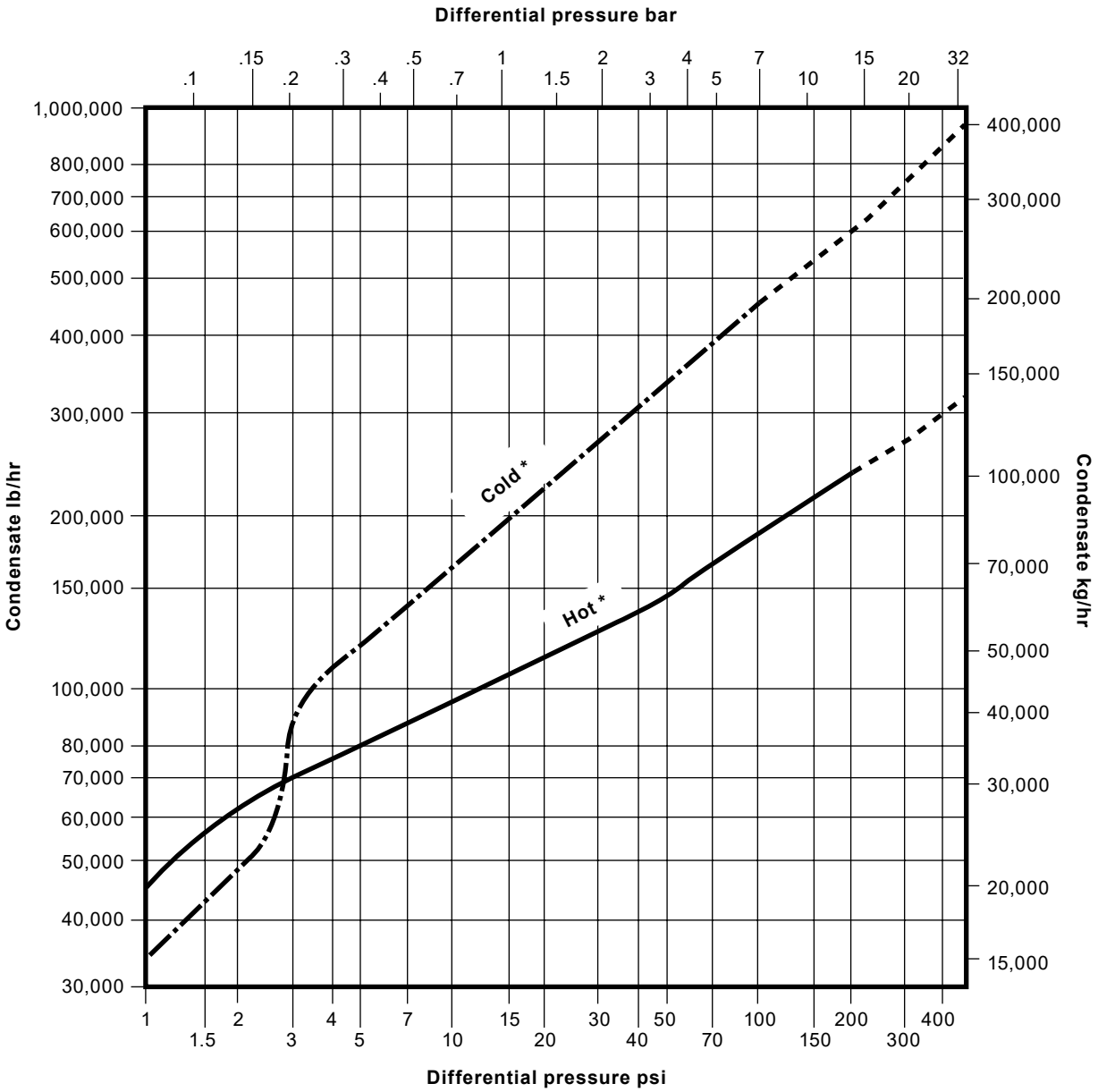
Materials

3" NPT/SW



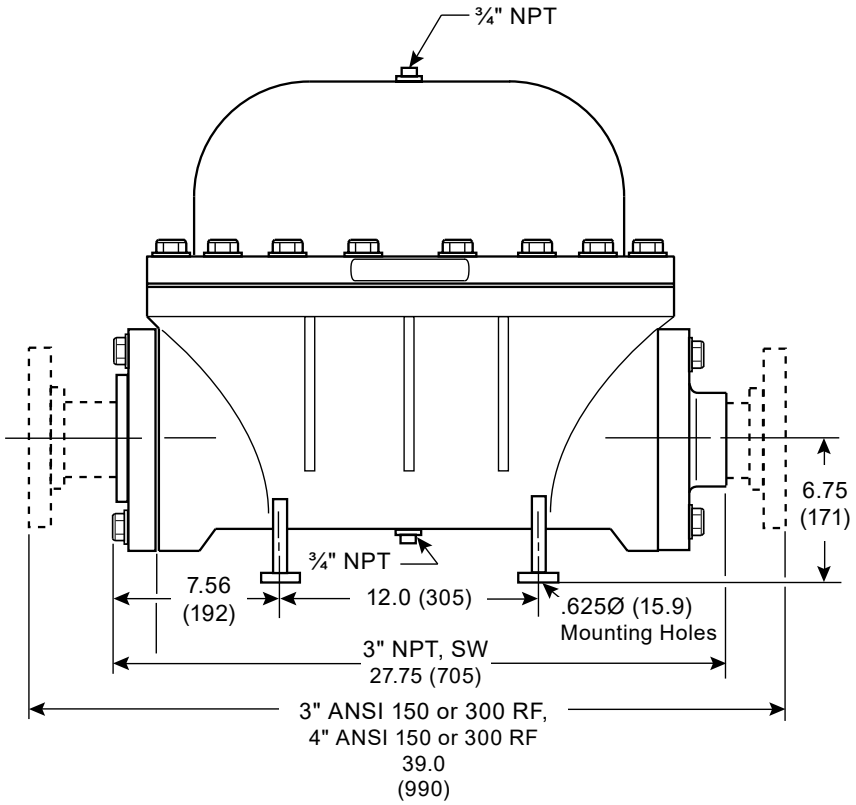
No.	Part	Material	
1	Body	Cast carbon steel	ASTM A216 WCB
2	Cover	Cast carbon steel	ASTM A216 WCB
3	Cover gasket	Graphite with SS insert	
4	Cover bolts	Alloy Steel	ASTM A193 GR B7
5	Lockwashers	Steel	
6	Main valve assembly	Stainless steel	
	Valve mechanical gasket	Graphite	
	Valve mechanical screws	Stainless steel	
7	Float	Stainless steel	ASTM A240 Type 304
8	Cover plug (¾" NPT)	Steel	
	Drain Plug (¾" NPT)	Steel	
9	Companion flange	Forged steel	
10	Flange bolts	Alloy steel	ASTM A193 GR B7
11	Air vent assembly	Stainless steel	
11A	Air vent	Stainless steel and bimetal	RAU Type RR
12	Air vent pipe	Stainless steel	

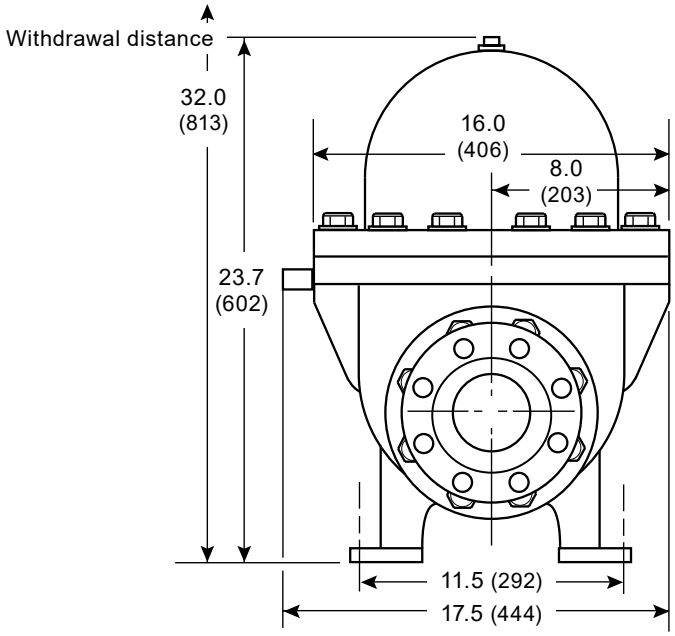
Capacities



* In this region the trap capacity may exceed the flow capacity of the connection piping.

Dimensions/weights (approximate) in inches (mm) and lbs (kg)





Weight

485 lb
(220 kg)

Sample specification

Steam traps shall be of the mechanical ball float type having cast steel bodies with stainless steel internal parts. The piping connections shall be horizontal in-line, and the body shall incorporate mounting legs with drilled pads. The traps shall have an integral thermostatic air vent. The trap body shall be horizontally split and all internal parts shall be completely serviceable without disturbing the inlet and outlet piping.

Installation

The trap should be located below and close to the equipment drain point. A pipeline strainer should be installed ahead of the trap, and full port isolating valves should be placed to permit servicing. The mounting legs should be bolted to a firm horizontal support. Access above the trap must be provided for servicing.
Complete installation instructions are given in IM-F01-30-US.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.

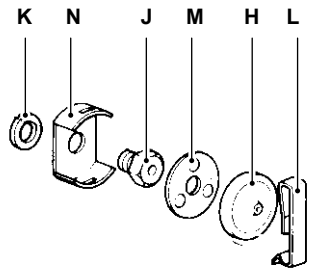
The trap should be disassembled periodically for inspection and cleaning of the valve mechanism and air vent.

Complete installation and maintenance instructions are given in IM-F01-30-US, which accompanies the product.

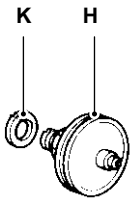
Spare parts

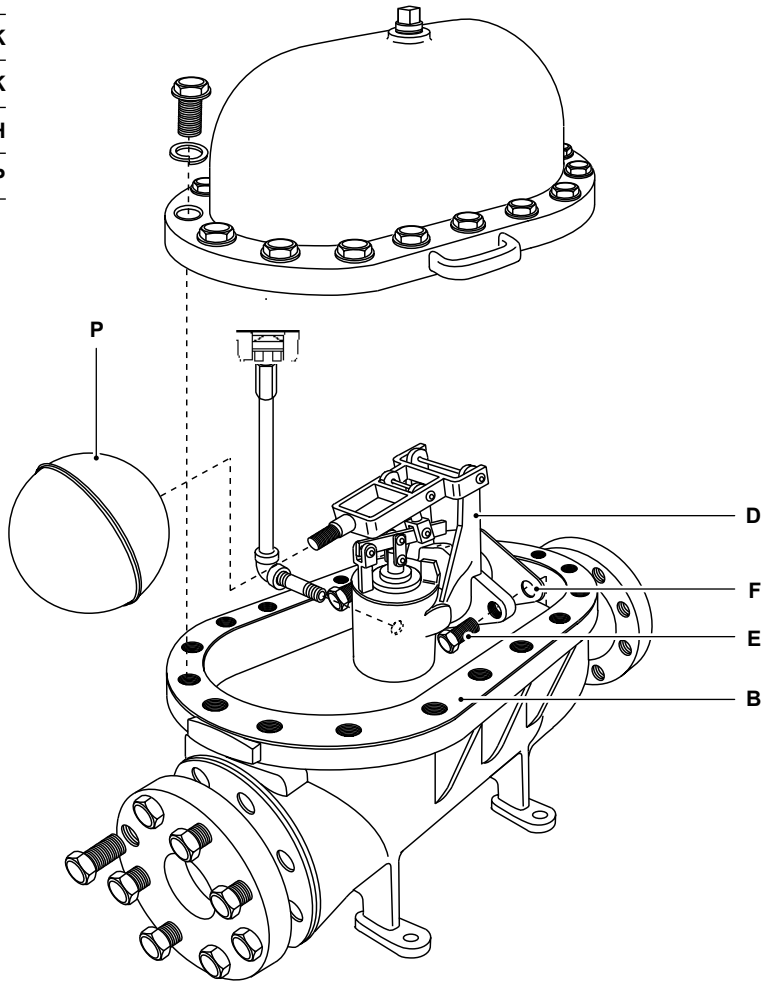
Valve mechanism kit	**D, E, F**
Gasket kit (pkt of 3 each)	**B, K**
Air vent kit Standard	**N, J, M, H, L, K**
Air vent kit optional	**K, H**
Float kit	**P**

Standard air vent assembly



Optional bimetal air vent assembly





TI-P179-13
CMGT Issue 7

FTC62
Carbon Steel
Ball Float Steam Traps (DN15 to DN25)

Description

The FTC62 is a carbon steel bodied ball float steam trap having stainless steel working internals and automatic air venting facility.

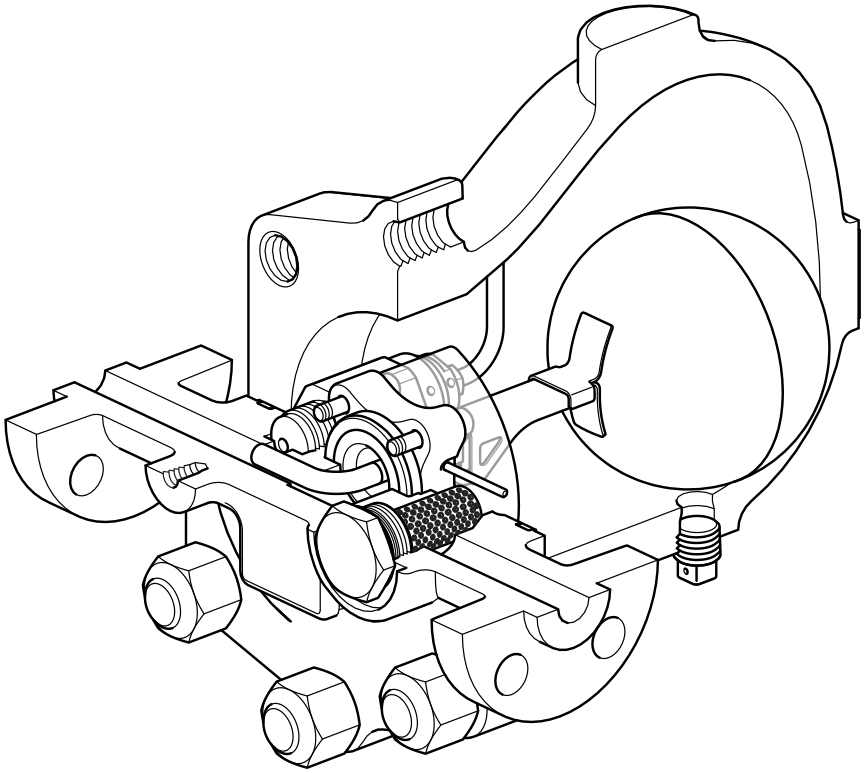
FTC62 available options when facing the body:	**L-R**	Select **L-R** for a flow direction of **Left-to-Right**
	or	
	R-L	Select **R-L** for a flow direction of **Right-to-Left**

Standards

This product fully complies with the requirements of the EU Pressure Equipment Directive 2014/68/EU and carries the CE mark.

Certification

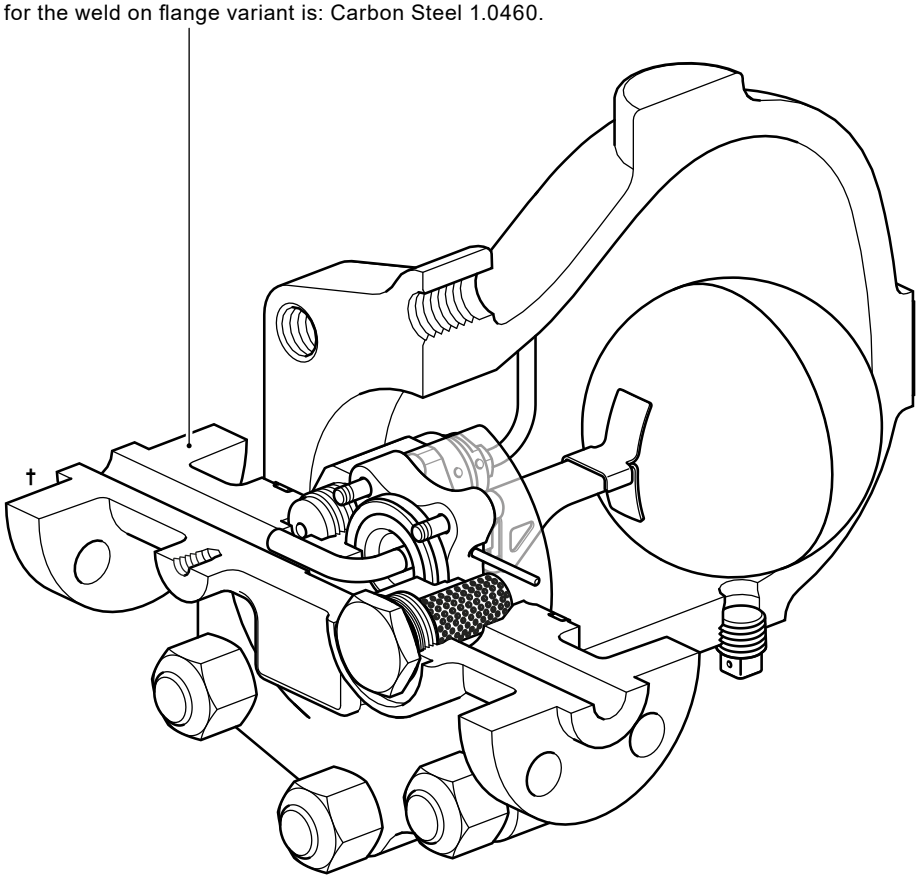
This unit is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.



Sizes and pipe connections

½", ¾" and 1"	Screwed BSP T Rp (ISO 7-1) or NPT
½", ¾" and 1"	Socket weld ends to BS 3799 and Class 3000 lbs
Standard flanges:	
DN15, DN20 and DN25	Flanged EN 1092-1 PN100 †
½", ¾" and 1"	Flanged ASME B 16.5 Class 600

Note for the PN100 variant:
† The material used for the weld on flange variant is: Carbon Steel 1.0460.

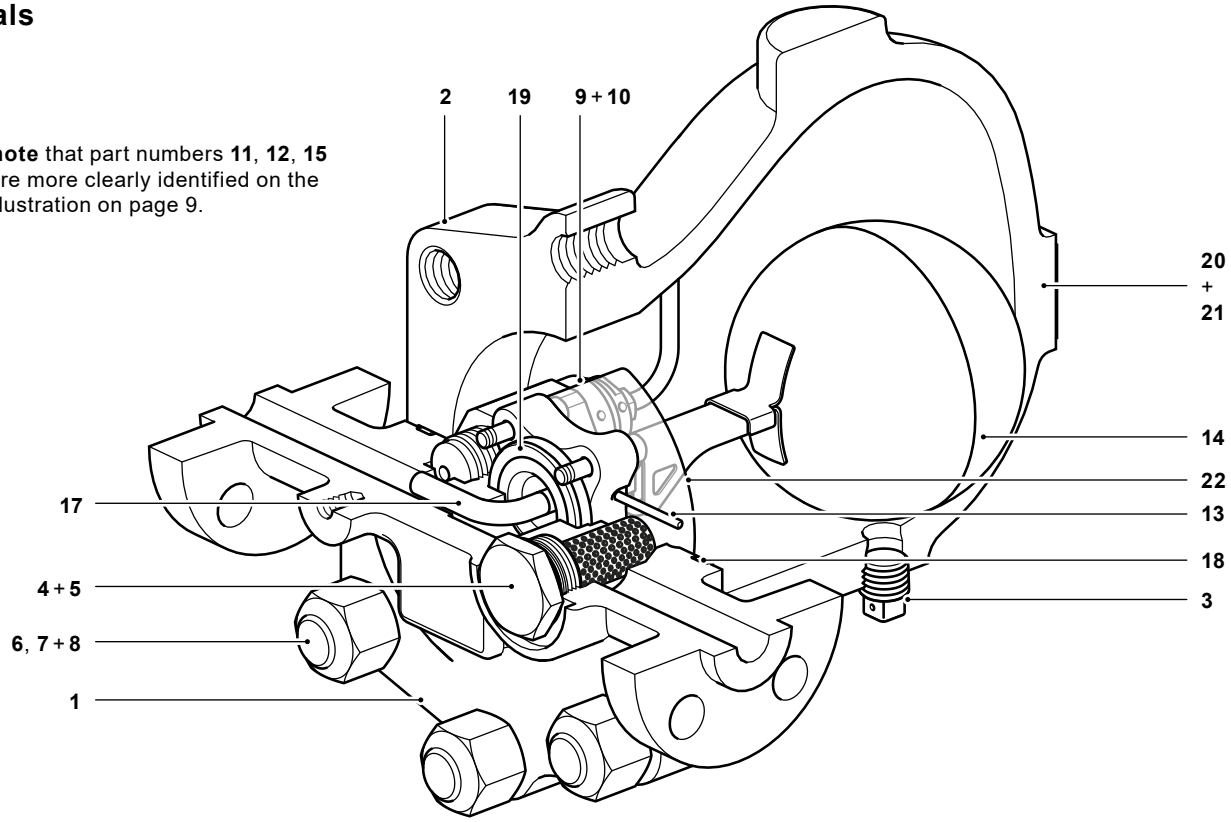


The material used for the studs and nuts upon all versions is:

- Studs = ASTM A193 B7
- Nuts = ASTM A194 Gr. 4 to EN 10269

Materials

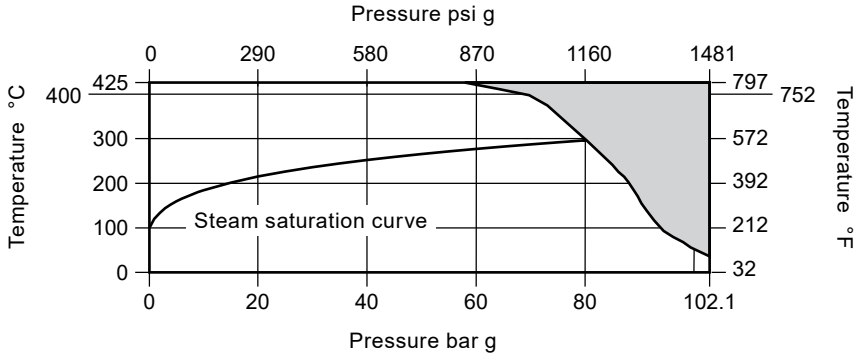
*Please note that part numbers **11**, **12**, **15** and **16** are more clearly identified on the spares illustration on page 9.



No.	Part	Material	
1	Body	Carbon steel	EN 10213 1.0619+N/ASTM A216 WCB
2	Cover		
3	⅜" NPT taper plug	Stainless steel	CF8 / 1.4308 or 1.4301 / 304
4	¾" UNF nut (x 6)	Carbon steel	ASTM A194 Gr. 7
5	¾" UNF studs x 85 mm long (x 6)	Carbon steel	ASTM A193 B7
6	Strainer cap	Stainless steel	CF8 / 1.4308 or 1.4301 / 304
7	Strainer screen	Stainless steel	AISI 316L
8	'S' type gasket	Stainless steel	AISI 304
9	Air vent assembly	Stainless steel	AISI 431 S29 + 303
10	Air vent tube	Stainless steel	ASTM A269 304L
11 *	Seat clamp	Stainless steel	CF8 / 1.4308 or AISI 303
12 *	M6 x 30 long cap screw (x 4)	Stainless steel	EN 150 3506-1
13	Pivot pin	Stainless steel	ASTM A276 304
14	Float assembly	Stainless steel	AISI 304L
15 *	½" Ø ball	Stainless steel	AISI 316
16 *	Conical spring	Stainless steel	Gr. 302 S26 Gr. 1
17	Valve seat and discharge pipe assembly	Stainless steel	AISI 431 S29 + 304L
18	Spirally wound gaskets Body to Cover and Seat to Body	Graphite filler + 304 stainless strip	
19			
20	Name-plate	Stainless steel	204
21	Hammer drive screws (x 2)	Stainless steel	18-8
22	Baffle plate	Stainless steel	304L

Pressure/temperature limits (ISO 6552)

Screwed
Socket weld

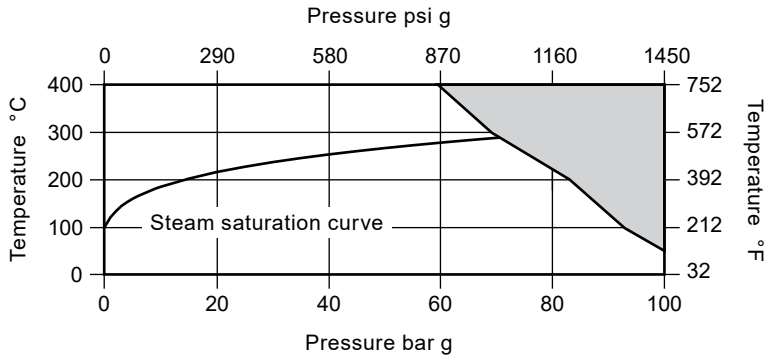


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

Body design condition				ASME Class 600
PMA	Maximum allowable pressure		102.1 bar g @ 38 °C	1481 psi g @ 100 °F
TMA	Maximum allowable temperature		425 °C @ 57.5 bar g	797 °F @ 834 psi g
Minimum allowable temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for saturated steam service		80 bar g @ 296 °C	1160 psi g @ 565 °F
TMO	Maximum operating temperature		425 °C @ 57.5 bar g	797 °F @ 834 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Product is safe for use under full vacuum conditions				
Minimum operating differential pressure			0.1 bar g	1.5 psi g
ΔPMX	Maximum differential pressure	FTC62-46	46 bar	667 psi
		FTC62-62	62 bar	899 psi
Designed for a maximum cold hydraulic test pressure of:			153.2 bar g	2222 psi g

Pressure/temperature limits (ISO 6552)

Flanged EN 1092
PN100

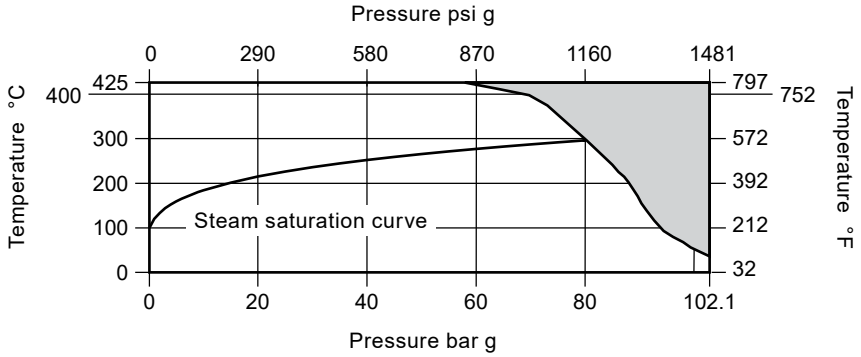


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

Body design condition				PN100
PMA	Maximum allowable pressure		100 bar g @ 50 °C	1450 psi g @ 122 °F
TMA	Maximum allowable temperature		400 °C @ 59.5 bar g	752 °F @ 863 psi g
Minimum allowable temperature			-10 °C	14 °F
PMO	Maximum operating pressure for saturated steam service		70.8 bar g @ 287 °C	1027 psi g @ 549 °F
TMO	Maximum operating temperature		400 °C @ 59.5 bar g	752 °F @ 863 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Product is safe for use under full vacuum conditions				
Minimum operating differential pressure			0.1 bar g	1.5 psi g
ΔPMX	Maximum differential pressure	FTC62-46	46 bar	667 psi
		FTC62-62	62 bar	899 psi
Designed for a maximum cold hydraulic test pressure of:			150 bar g	2176 psi g

Pressure/temperature limits (ISO 6552)

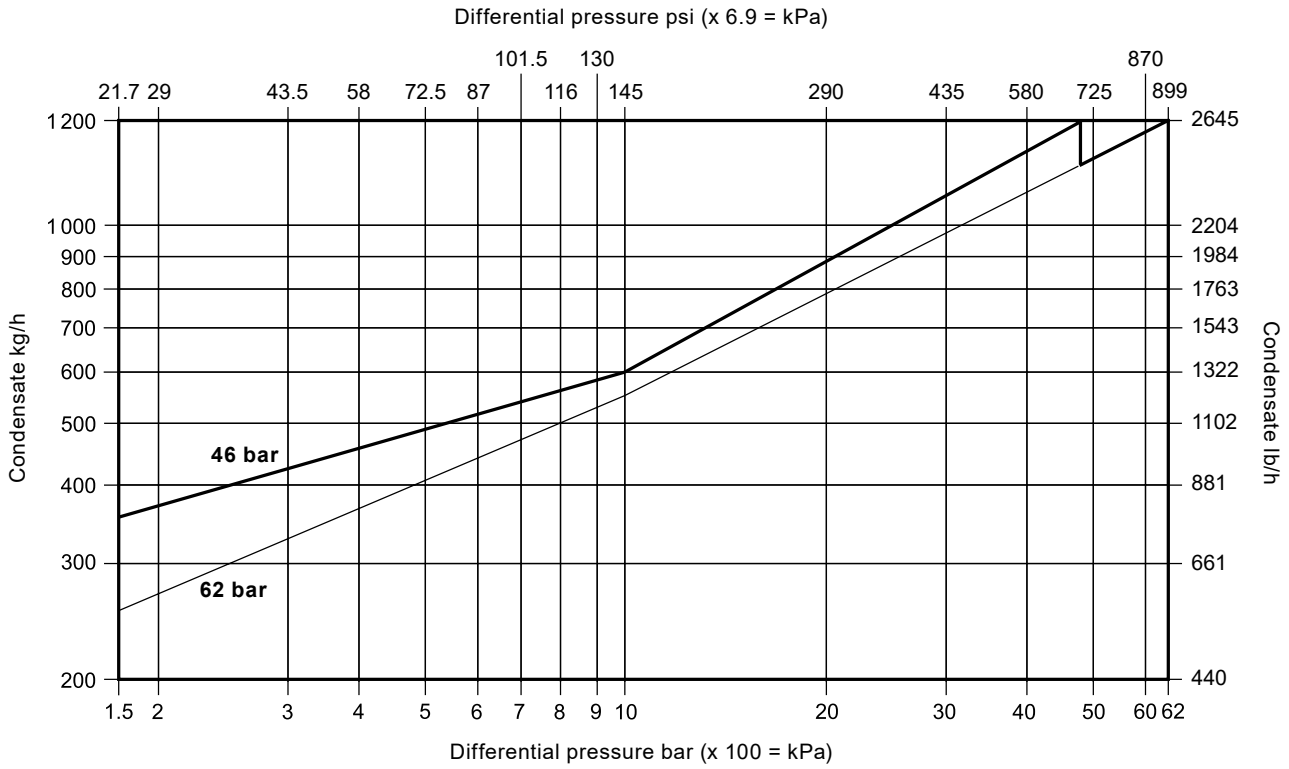
Flanged
ASME Class 600



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

Body design condition				ASME Class 600
PMA	Maximum allowable pressure		102.1 bar g @ 38 °C	1481 psi g @ 100 °F
TMA	Maximum allowable temperature		425 °C @ 57.5 bar g	797 °F @ 834 psi g
Minimum allowable temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for saturated steam service		80 bar g @ 296 °C	1160 psi g @ 565 °F
TMO	Maximum operating temperature		425 °C @ 57.5 bar g	797 °F @ 834 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Product is safe for use under full vacuum conditions				
Minimum operating differential pressure			0.1 bar g	1.5 psi g
ΔPMX	Maximum differential pressure	FTC62-46	46 bar	667 psi
		FTC62-62	62 bar	899 psi
Designed for a maximum cold hydraulic test pressure of:			153.2 bar g	2222 psi g

Capacities



Capacities shown above are based on condensate at saturation temperature. Under start-up conditions when condensate is cold the internal bi-metallic air vent will be open and provides additional capcaity to the main valve.

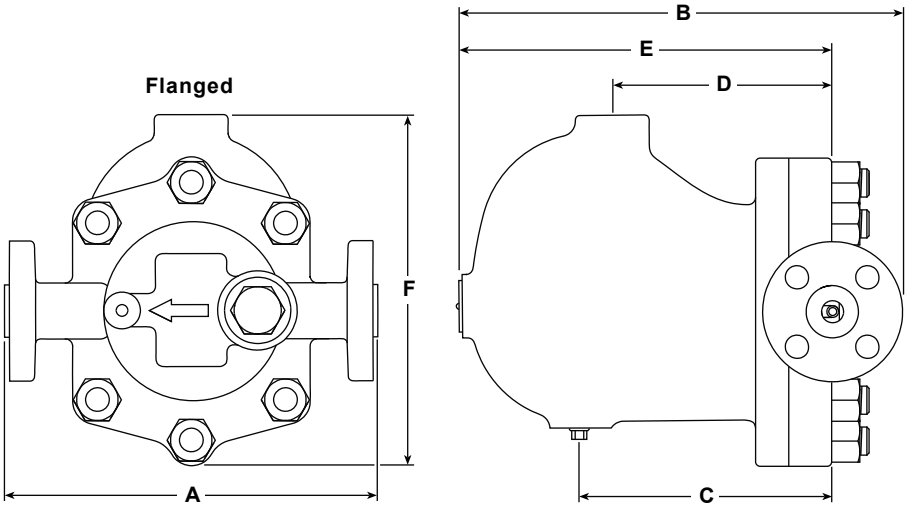
The table below gives the minimum additional cold water capacities from the air vent on all sizes.

Note: The air vent closing temperature range = 120 °C to 135 °C (248 °F to 275 °F).

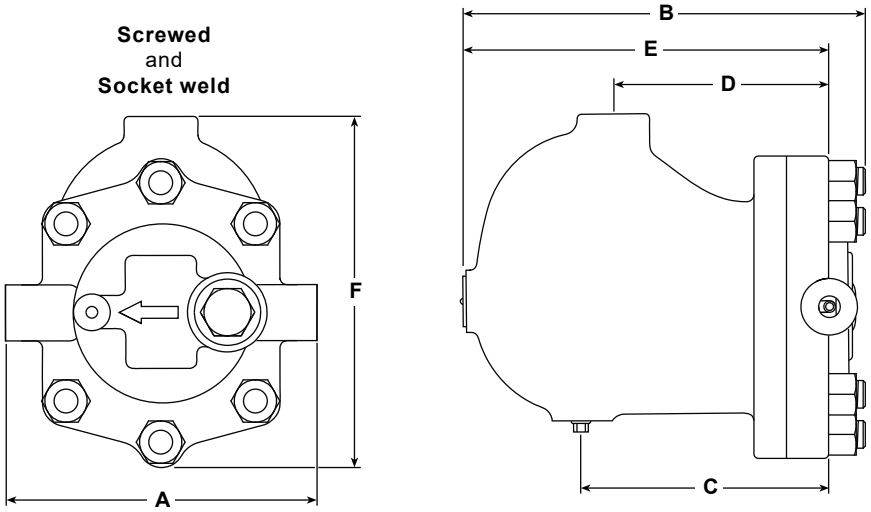
For differential pressures less than 1.5 bar g (22 psi g), the additional cold water capacity is minimal.

ΔP in bar (psi)	1.5 (22)	10 (145)	30 (435)	46 (667)	62 (899)
FTS62	**Minimum additional cold water capacity in kg/h (lb/h)**				
46 bar version	20 (44)	426 (939)	536 (1182)	800 (1764)	
62 bar version	20 (44)	350 (772)	440 (970)	930 (2050)	800 (1764)

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Notes:
1. PN100 EN 1092-1 and ASME 600 B 16.5 face-to-face dimensions



Size	Flanged						Screwed and Socket weld			Common sizes			
	PN100			ASME 600									
	A	B	Weight	A	B	Weight	A	B	Weight	C	D	E	F
DN15	300 (11.8)	304.0 (12)	25.0 (55.1)	261 (10.3)	299 (11.77)	24.0 (52.9)	190 (7.48)	287.5 (11.3)	22.0 (48.5)	172.5 (6.79)	148 (5.83)	251.5 (9.90)	239 (9.41)
DN20		316.5 (12.5)	26.0 (57.3)	271 (10.7)	309 (12.2)	25.5 (56.2)							
DN25		321.5 (12.7)	28.0 (61.7)	291 (11.5)	314 (12.4)	27.0 (59.5)							

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P179-15) supplied with the product.

Installation note

The FTC62 must be installed with the direction of flow as indicated on the body, and with the float arm in a horizontal plane so that it rises and falls vertically.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

How to order

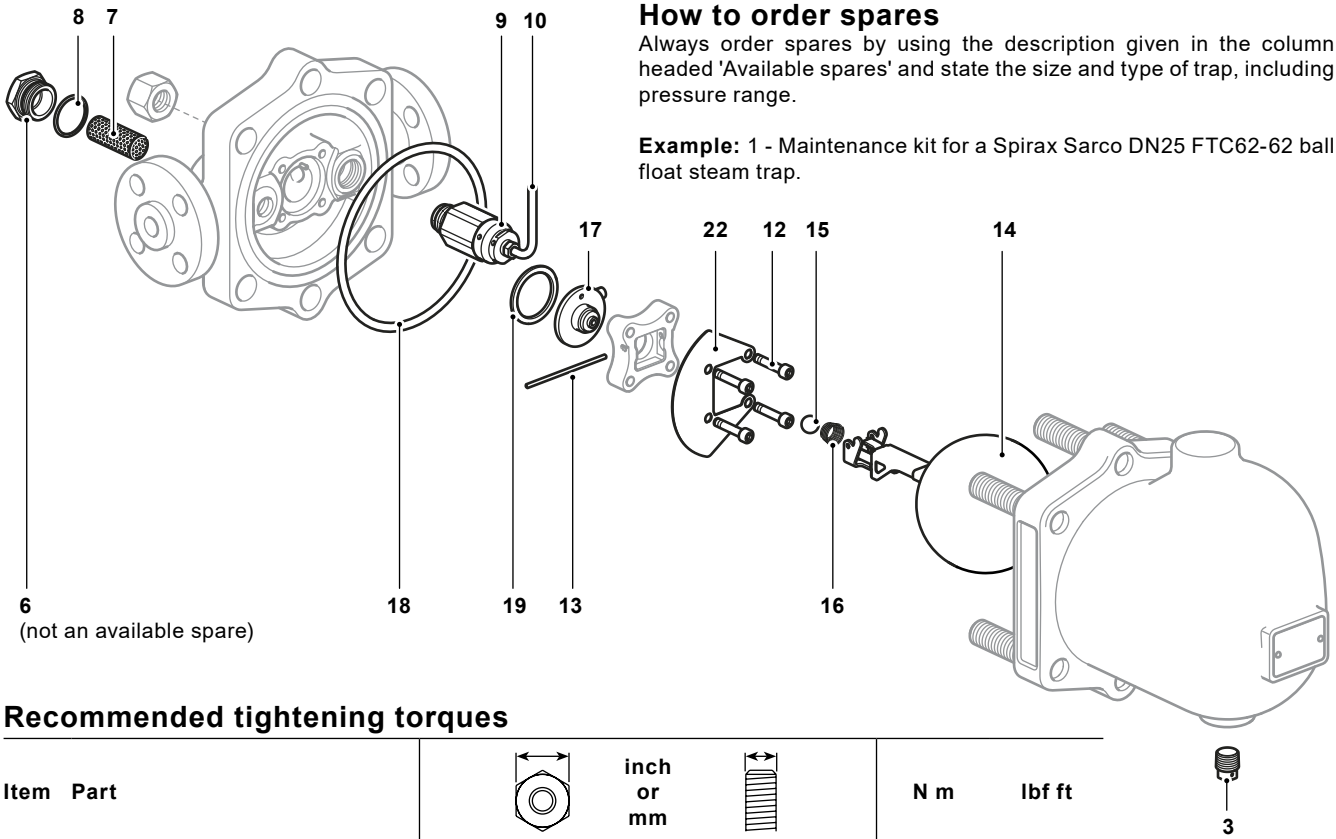
Example: 1 off Spirax Sarco DN25 FTC62-62 L-R ball float steam trap, flanged to EN 1092 PN100 with carbon steel body and cover and thermostatic air vent.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Body/cover gasket kit		**18**
Air vent assembly + Air vent tube		**9** and **10**
Strainer screen + 'S' type gasket		**7** and **8**
Maintenance kit	⅜" NPT taper plug	**3**
	M6 x 30 long cap screw (x 4)	**12**
	Pivot pin	**13**
	Float assembly	**14**
	½" Ø ball	**15**
	Conical spring	**16**
	Valve seat and discharge pipe assembly	**17**
	'S' type gasket + Spirally wound gaskets	**8**, **18** and **19**
	Baffle plate	**22**
Overhaul kit		**3, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19** and **22**



How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap, including pressure range.

Example: 1 - Maintenance kit for a Spirax Sarco DN25 FTC62-62 ball float steam trap.

Recommended tightening torques

Item	Part	inch or mm		N m	lbf ft
3	⅜" NPT Square head plug	11 mm A/F	⅜" NPT	As required	
4	¾" UNF Hex. Nut	1.125" A/F	¾" UNF	252-260	186-192
6	Strainer cap	32 mm A/F	M28 x 1.5	170-190	125-140
9	Air vent assembly	32 mm A/F	M22 x 1.5	80-88	59-65
10	Air vent tube assembly	11 mm A/F	M10 x 1.5	10-12	7-9
12	M6 x 30 Socket head cap screw	5 mm A/F (Hex Key)	M6	14-16	10-12

TI-P179-14
CMGT Issue 6

FTS62
Stainless Steel
Ball Float Steam Traps (DN15 to DN25)

Description

The FTS62 is a stainless steel bodied ball float steam trap having stainless steel working internals and automatic air venting facility.

FTS62 available options when facing the body:

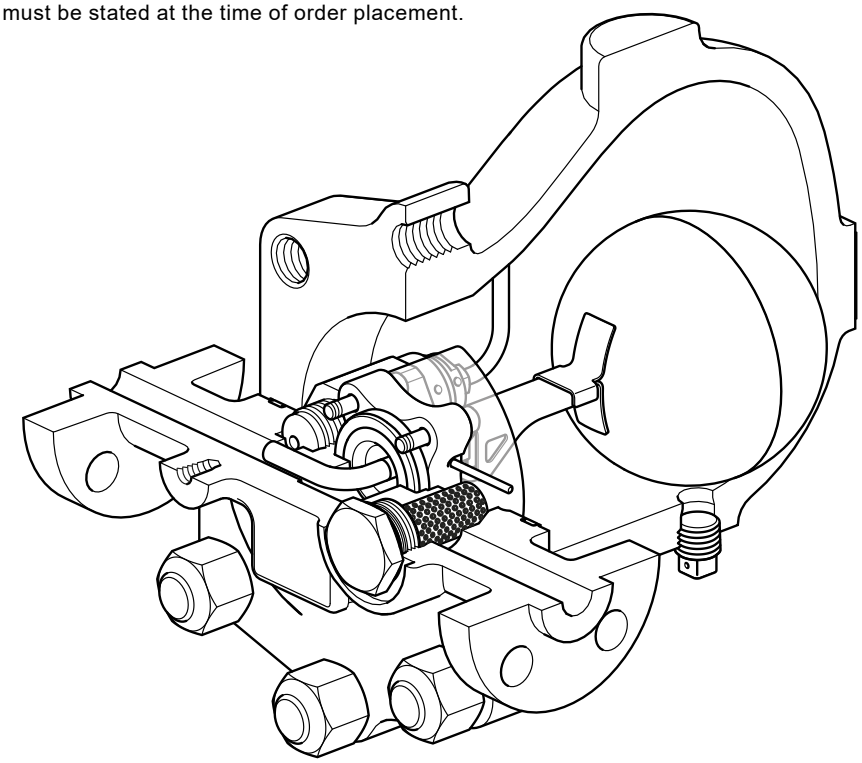
L-R	Select **L-R** for a flow direction of **Left-to-Right**
	or
R-L	Select **R-L** for a flow direction of **Right-to-Left**

Standards

This product fully complies with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations and carries the CE / UKCA mark.

Certification

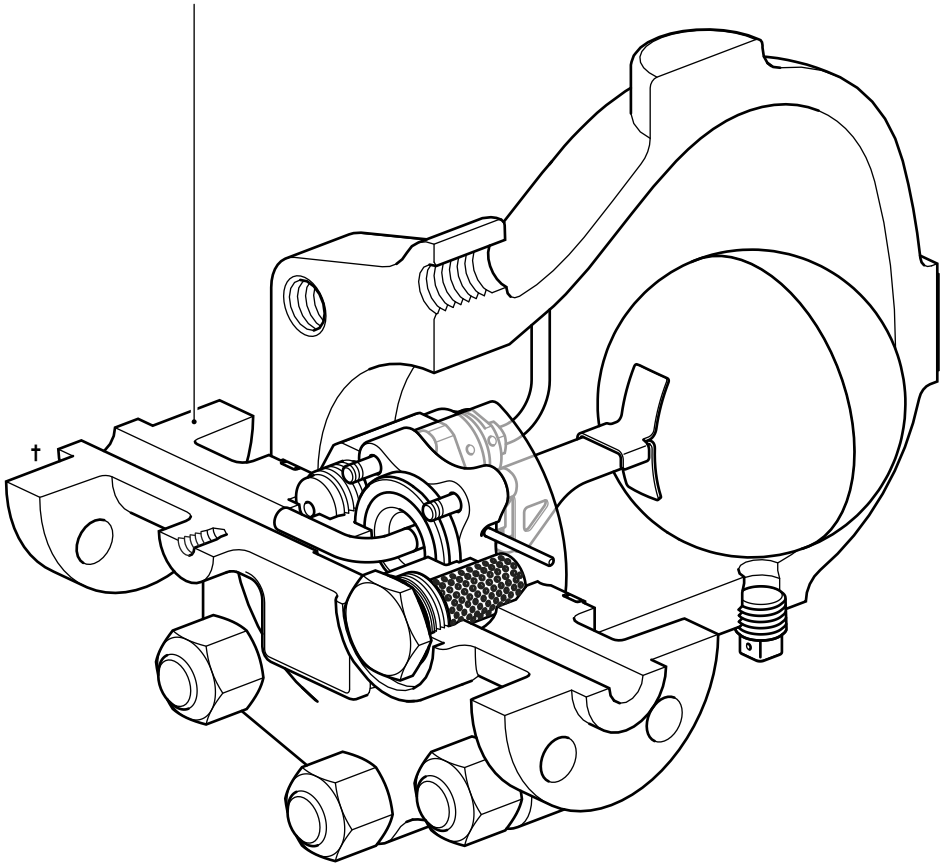
This unit is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.



Sizes and pipe connections

½", ¾" and 1"	Screwed BSP or NPT
½", ¾" and 1"	Socket weld ends to BS 3799 and Class 3000 lbs
Standard flanges:	
DN15, DN20 and DN25	Flanged EN 1092-1 PN100 †
½", ¾" and 1"	Flanged ASME B 16.5 Class 600

Note for the PN100 variant:
† The material used for the weld on flange variant is:Stainless steel 1.4301.

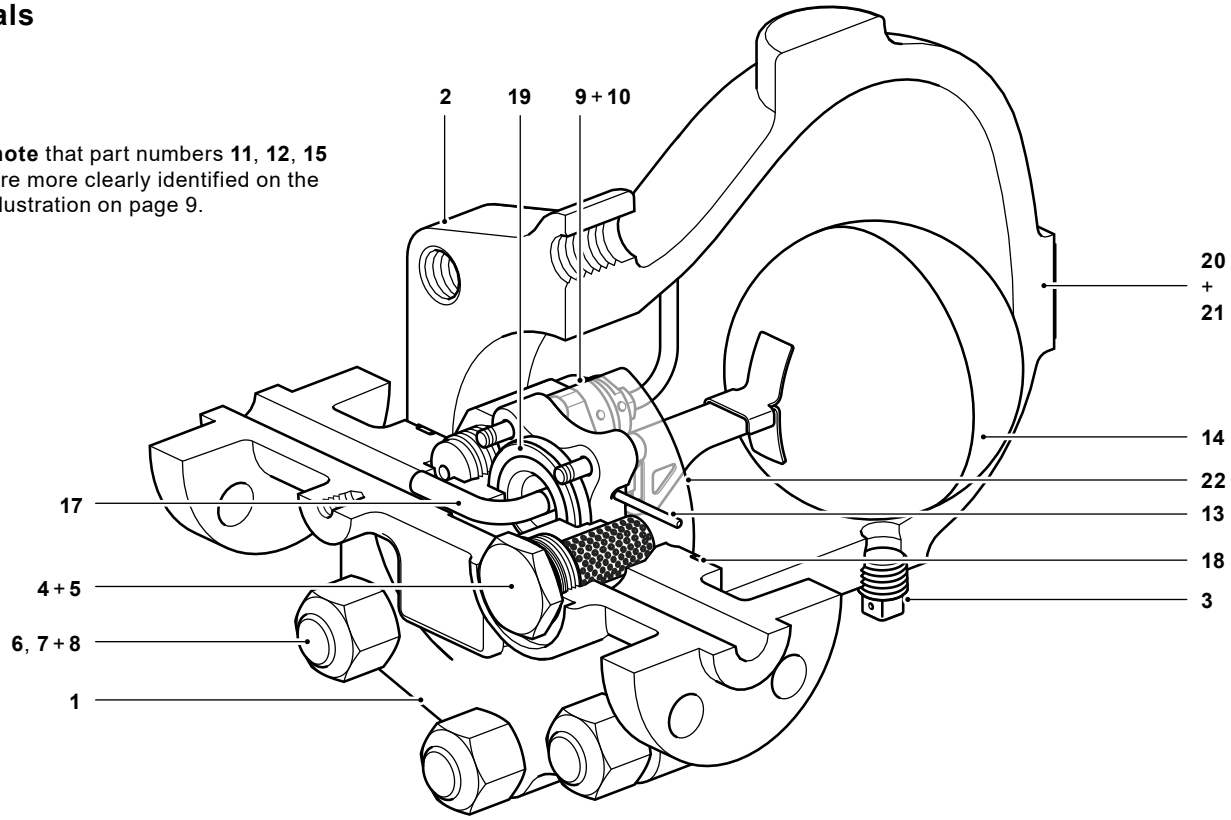


The material used for the studs and nuts upon all versions is

- Studs = ASTM A193 B7
- Nuts = ASTM A194 Gr. 4 to EN 10269

Materials

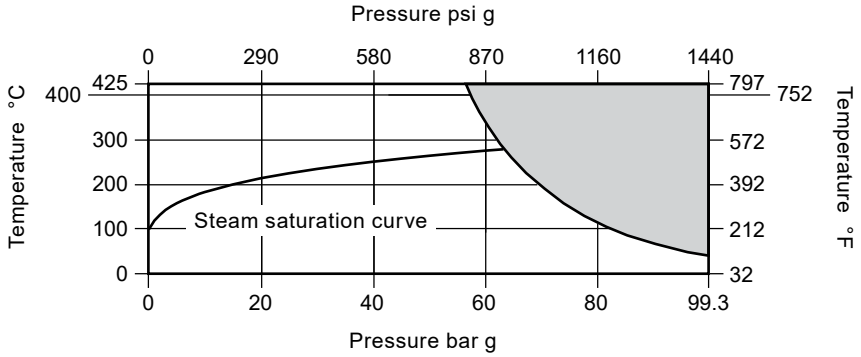
*Please note that part numbers **11**, **12**, **15** and **16** are more clearly identified on the spares illustration on page 9.



No.	Part	Material	
1	Body	Stainless steel	ASTM A351 CF8 EN10213 1.4308
2	Cover		
3	⅜" NPT taper plug	Stainless steel	CF8/1.4308 or 1.4301/304
4	¾" UNF nut (6)	Carbon steel	ASTM A194 Gr. 7
5	¾" UNF studs x 85mm long (x 6)	Carbon steel	ASTM A193 B7
6	Strainer cap	Stainless steel	CF8/1.4308 or 1.4301/304
7	Strainer screen	Stainless steel	AISI 316L
8	'S' type gasket	Stainless steel	AISI 304
9	Air vent assembly	Stainless steel	AISI 431 S29 + 303
10	Air vent tube	Stainless steel	ASTM A269 304L
11*	Seat clamp	Stainless steel	CF8/1.4308 or AISI 303
12*	M6 x 30 long cap screw (x 4)	Stainless steel	EN 150 3506-1
13	Pivot pin	Stainless steel	ASTM A276 304
14	Float assembly	Stainless steel	AISI 304L
15*	½" Ø ball	Stainless steel	AISI 316
16*	Conical spring	Stainless steel	Gr. 302 S26 Gr. 1
17	Valve seat and discharge pipe assembly	Stainless steel	AISI 431 S29 + 304L
18	Spirally wound gaskets Body to Cover and Seat to Body	Graphite filler + 304 stainless strip	
19			
20	Name-plate	Stainless steel	204
21	Hammer drive screws (x 2)	Stainless steel	18-8
22	Baffle plate	Stainless steel	304L

Pressure/temperature limits (ISO 6552)

Screwed
Socket weld

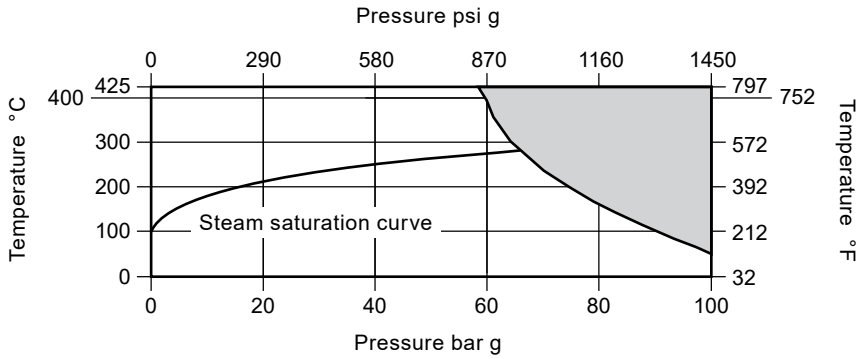


The product must not be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

Body design condition				ASME Class 600
PMA	Maximum allowable pressure		99.3 bar g @ 38 °C	1440 psi g @ 100 °F
TMA	Maximum allowable temperature		425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum allowable temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for saturated steam service		63.1 bar g @ 280 °C	915 psi g @ 536 °F
TMO	Maximum operating temperature		425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Product is safe for use under full vacuum conditions				
Minimum operating differential pressure			0.1 bar g	1.5 psi g
ΔPMX	Maximum differential pressure	FTS62-46	46 bar	667 psi
		FTS62-62	62 bar	899 psi
Designed for a maximum cold hydraulic test pressure of:			149 bar g	2161 psi g

Pressure/temperature limits (ISO 6552)

Flanged EN 1092
PN100

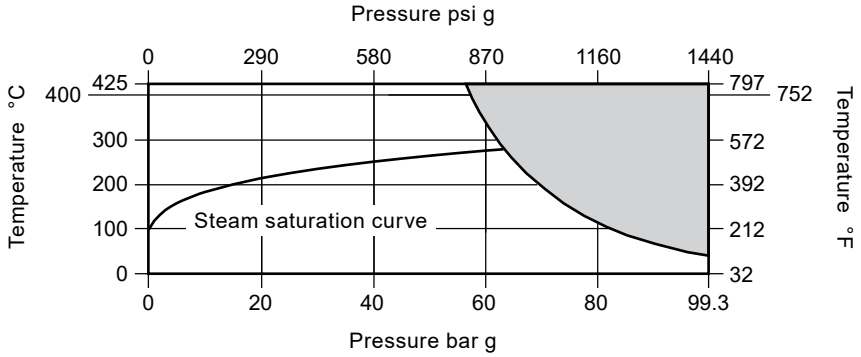


The product must not be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

Body design condition				PN100
PMA	Maximum allowable pressure		100 bar g @ 50 °C	1450 psi g @ 122 °F
TMA	Maximum allowable temperature		425 °C @ 58.9 bar g	797 °F @ 854 psi g
Minimum allowable temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for saturated steam service		65.8 bar g @ 283 °C	954 psi g @ 541 °F
TMO	Maximum operating temperature		425 °C @ 58.9 bar g	797 °F @ 854 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Product is safe for use under full vacuum conditions				
Minimum operating differential pressure			0.1 bar g	1.5 psi g
ΔPMX	Maximum differential pressure	FTS62-46	46 bar	667 psi
		FTS62-62	62 bar	899 psi
Designed for a maximum cold hydraulic test pressure of:			150 bar g	2176 psi g

Pressure/temperature limits (ISO 6552)

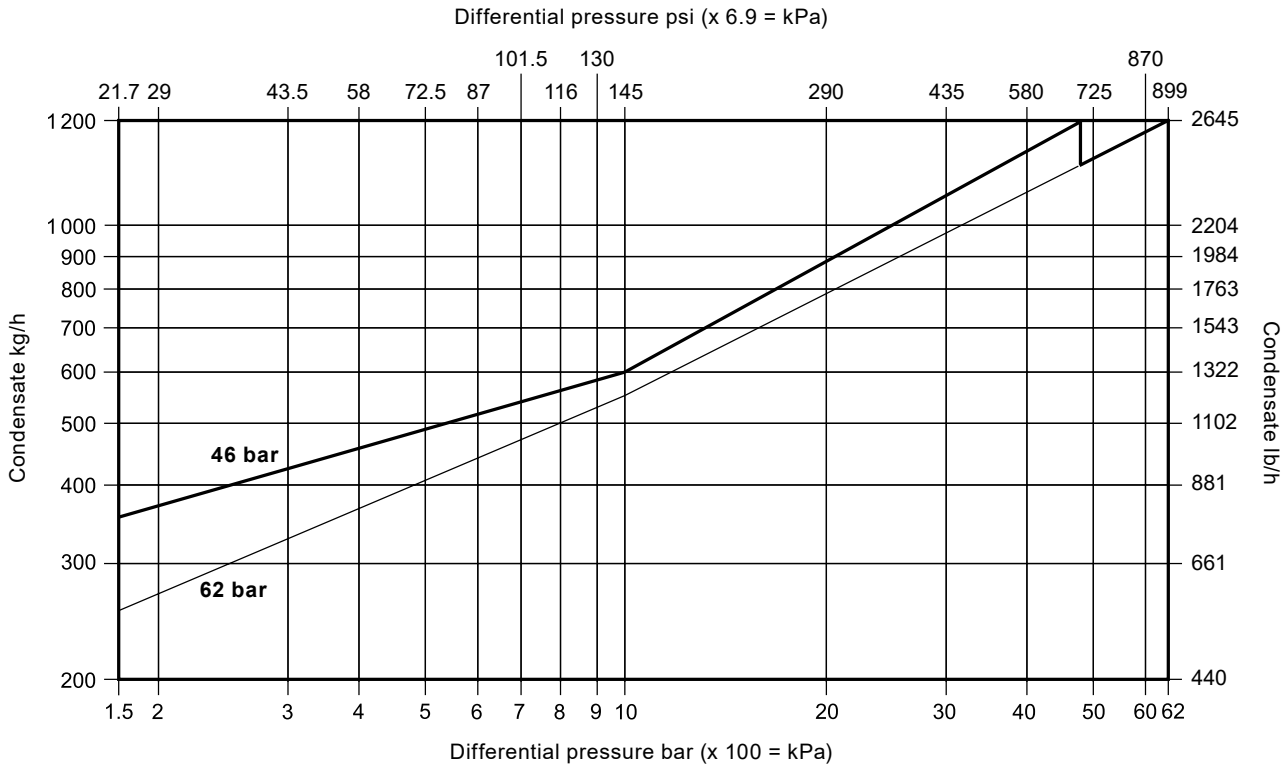
Flanged
ASME Class 600



The product must not be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

Body design condition				ASME Class 600
PMA	Maximum allowable pressure		99.3 bar g @ 38 °C	1440 psi g @ 100 °F
TMA	Maximum allowable temperature		425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum allowable temperature			-29 °C	-20 °F
PMO	Maximum operating pressure for saturated steam service		63.1 bar g @ 280 °C	915 psi g @ 536 °F
TMO	Maximum operating temperature		425 °C @ 56 bar g	797 °F @ 812 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Product is safe for use under full vacuum conditions				
Minimum operating differential pressure			0.1 bar g	1.5 psi g
ΔPMX	Maximum differential pressure	FTS62-46	46 bar	667 psi
		FTS62-62	62 bar	899 psi
Designed for a maximum cold hydraulic test pressure of:			149 bar g	2161 psi g

Capacities



Capacities shown above are based on condensate at saturation temperature. Under start-up conditions when condensate is cold the internal bi-metallic air vent will be open and provides additional capcaity to the main valve.

The table below gives the minimum additional cold water capacities from the air vent on all sizes.

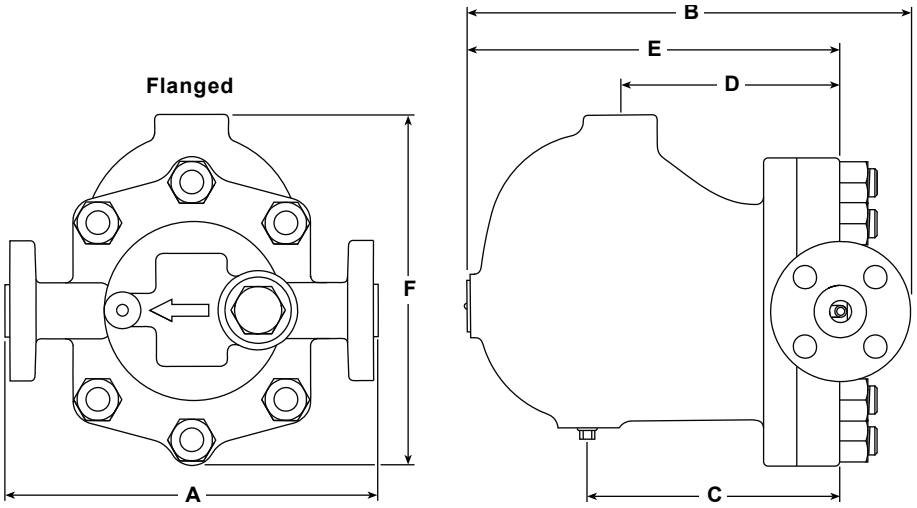
Note: The air vent closing temperature range = 120 °C to 135 °C (248 °F to 275 °F).

For differential pressures less than 1.5 bar g (22 psi g), the additional cold water capacity is minimal.

ΔP in bar (psi)	1.5 (22)	10 (145)	30 (435)	46 (667)	62 (899)
FTS62	**Minimum additional cold water capacity in kg/h (lb/h)**				
46 bar version	20 (44)	426 (939)	536 (1182)	800 (1764)	
62 bar version	20 (44)	350 (772)	440 (970)	930 (2050)	800 (1764)

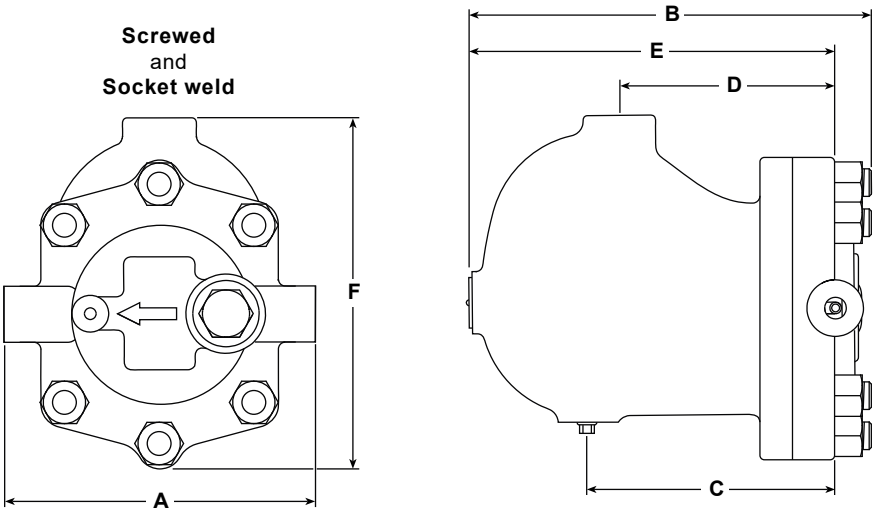
Dimensions/weights
(approximate) in mm (in) and kg (lb)

Flanged



Notes:
1. PN100 EN 1092-1 and ASME 600 B 16.5 face-to-face dimensions

Screwed and Socket weld



Size	Flanged						Screwed and Socket weld			Common sizes			
	PN100			ASME 600									
	A	B	Weight	A	B	Weight	A	B	Weight	C	D	E	F
DN15 (½")	300 (11.8)	304.0 (12)	25.0 (55.1)	261 (10.3)	299 (11.77)	24.0 (52.9)	190 (7.48)	287.5 (11.3)	22.0 (48.5)	172.5 (6.79)	148 (5.83)	251.5 (9.90)	239 (9.41)
DN20 (¾")		316.5 (12.5)	26.0 (57.3)	271 (10.7)	309 (12.2)	25.5 (56.2)							
DN25 (1")		321.5 (12.7)	28.0 (61.7)	291 (11.5)	314 (12.4)	27.0 (59.5)							

Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-P179-15) supplied with the product.

Installation note
The FTS62 must be installed with the direction of flow as indicated on the body, and with the float arm in a horizontal plane so that it rises and falls vertically.

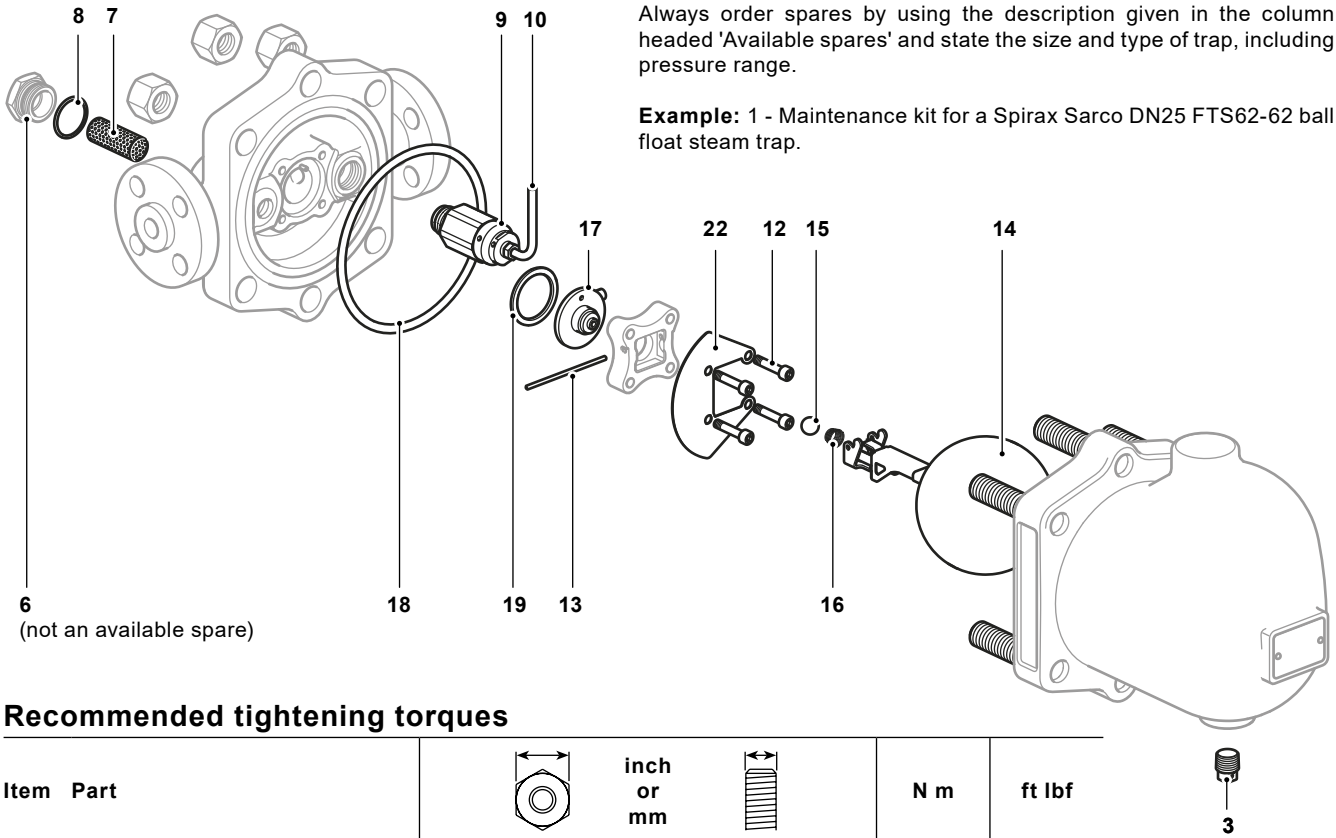
Disposal
This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

How to order
Example: 1 off Spirax Sarco DN25 FTS62-62 L-R ball float steam trap, flanged to EN 1092 PN100 with stainless steel body and cover and thermostatic air vent.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares		
Body/cover gasket kit		**18**
Air vent assembly + Air vent tube		**9** and **10**
Strainer screen + 'S' type gasket		**7** and **8**
Maintenance kit	⅜" NPT taper plug	**3**
	M6 x 30 long cap screw (x 4)	**12**
	Pivot pin	**13**
	Float assembly	**14**
	½" Ø ball	**15**
	Conical spring	**16**
	Valve seat and discharge pipe assembly	**17**
	'S' type gasket + Spirally wound gaskets	**8**, **18** and **19**
	Baffle plate	**22**
Overhaul kit		**3, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18**, **19** and **22**



How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap, including pressure range.

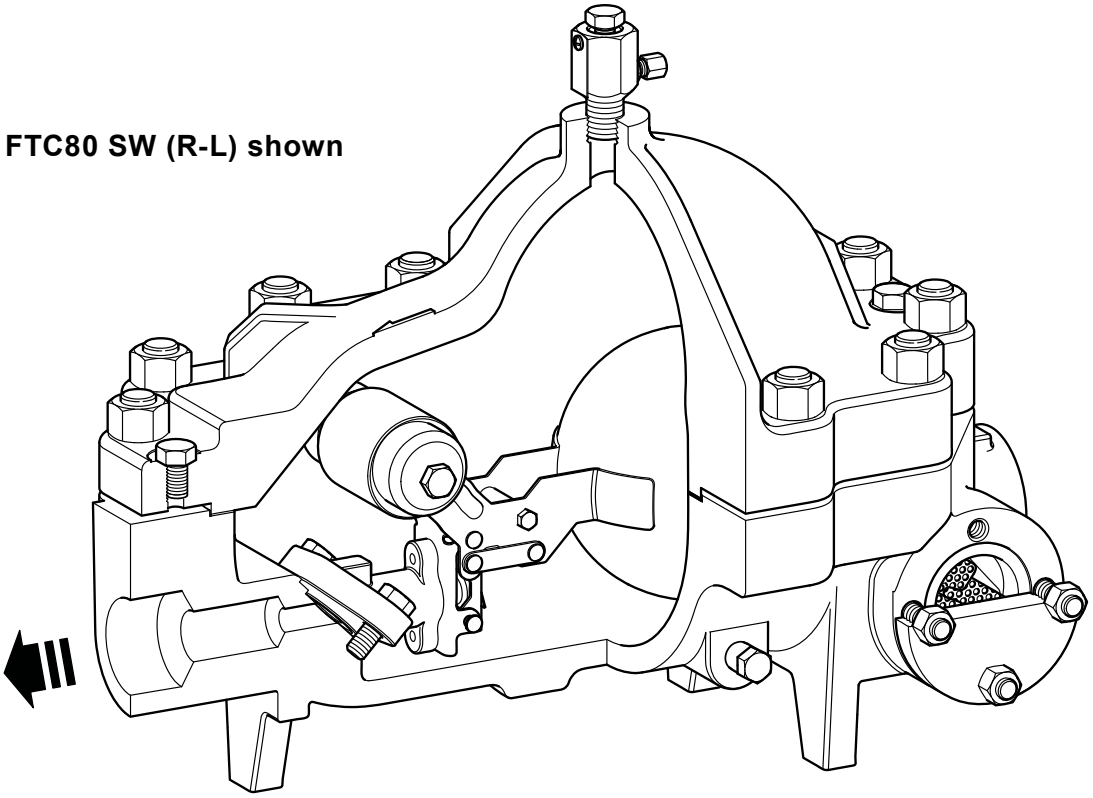
Example: 1 - Maintenance kit for a Spirax Sarco DN25 FTS62-62 ball float steam trap.

Recommended tightening torques

Item	Part	inch or mm		N m	ft lbf
3	⅜" NPT Square head plug	11 mm A/F	⅜" NPT	As required	
4	¾" UNF Hex. Nut	1.125" A/F	¾" UNF	252-260	186 - 192
6	Strainer cap	32 mm A/F	M28 x 1.5	170-190	125-140
9	Air vent assembly	32 mm A/F	M22 x 1.5	80-88	59-65
10	Air vent tube assembly	11 mm A/F	M10 x 1.5	10-12	7-9
12	M6 x 30 Socket head cap screw	5 A/F (Hex Key)	M6	14-16	10-12

TI-P179-02
CMGT Issue 8

FTC80
Cast Steel
1½" and 2" Ball Float Steam Trap with ASTM Body



2" FTC80 SW (R-L) shown

Description

As standard, the FTC80 ball float steam trap is supplied with a right to left (R-L) flow configuration having horizontal connections and has provision for adding an air venting option; Please note that the unit is supplied with a ¾" socket weld connection in the cover with a plug screwed into the fitting. It has been designed for floor mounting and is suitable for most high-pressure process and drainage applications. Its simple robust ball float mechanism ensures excellent resistance to waterhammer. All internals are easily accessible for in-line maintenance and a drain port allows full body drainage.
It has a large maintainable strainer screen that extends service intervals and is located in an accessible flanged chamber.

Available options

Factory fitted external BDV2 air vent having a ½" NPT screwed connection (a ½" BSP T Rp (ISO 7-1) screwed connection is used on the PN100 version)

Factory fitted internal fixed bleed for continuous discharge of air and other incondensable gasses

Note: As standard the unit is supplied with a ¾" socket weld connection in the cover with a ⅜" BSP T Rp (ISO 7-1) screwed plug fitted.

Standard

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

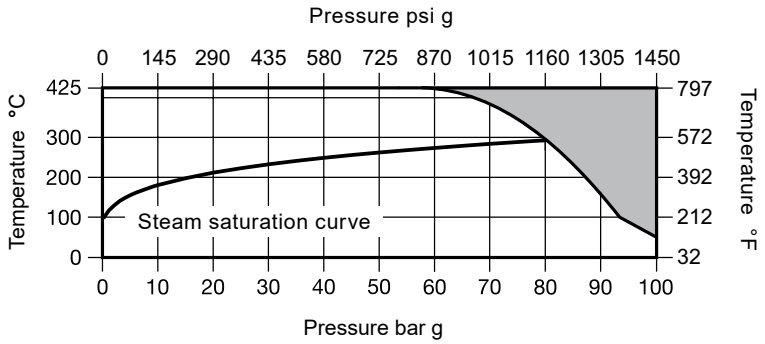
Certification

This product is available with certification to EN 10204 3.1 for the body, cover, fasteners, screen flange and BDV2 air vent.
Note: All certification / inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

1½" and 2" (DN40 and DN50) ASME B 16.11 Class 6000 socket weld.
1½" and 2" (DN40 and DN50) ASME B 16.5 Class 600 flanges.
Note: Other connections are available upon request but may limit the operating range – Please consult Spirax Sarco for further information.
Drain plug connection is ⅜" screwed NPT as standard (a ⅜" screwed BSP T Rp (ISO 7-1) connection is used on the PN100 version).

Pressure/temperature limits



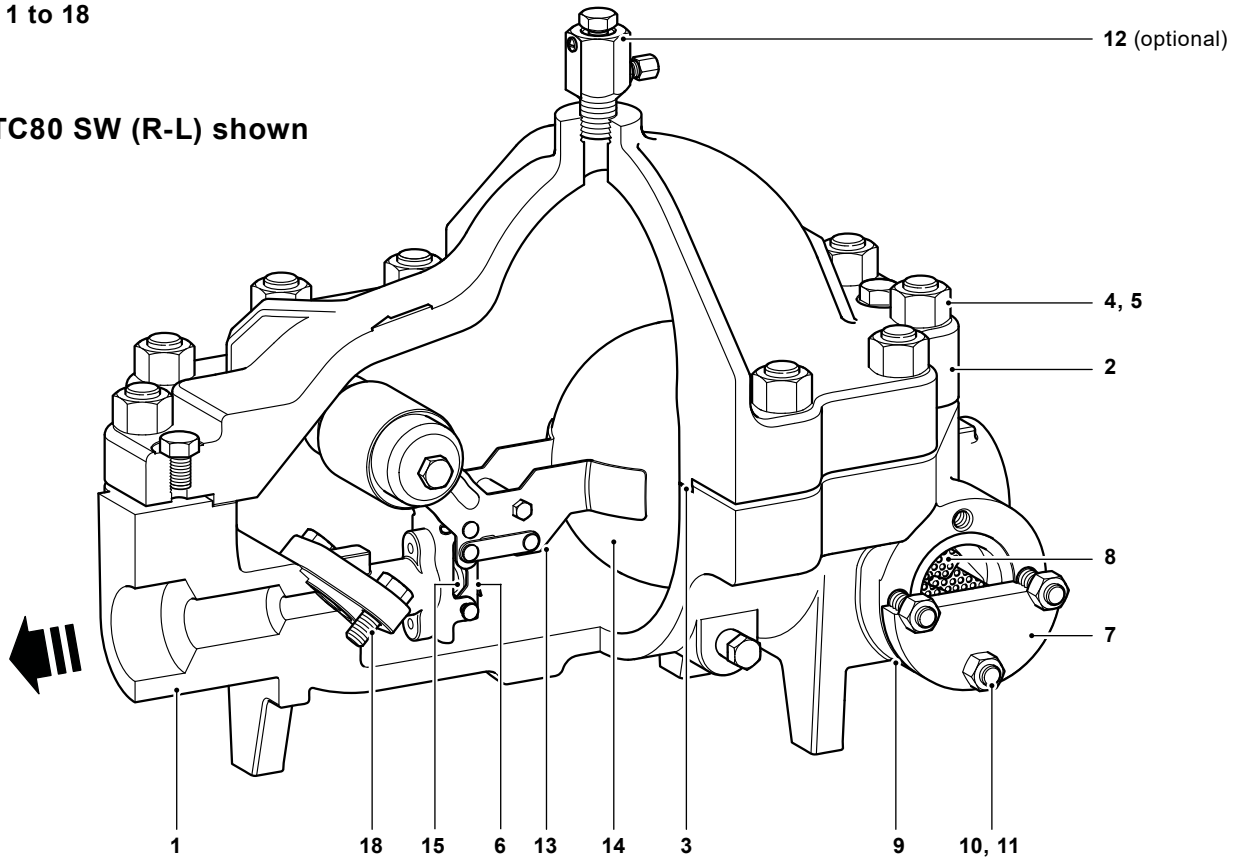
The product **must not** be used in this region.

Body design conditions				ASME 600
PMA	Maximum allowable pressure		100 bar g @ 52 °C	1450 psi g @ 126 °F
TMA	Maximum allowable temperature		425 °C @ 57 bar g	797 °F @ 827 psi
Minimum allowable temperature			-29 °C	-20.2 °F
PMO	Maximum operating pressure for saturated steam service		80 bar g	1160 psi g
TMO	Maximum operating temperature		425 °C @ 57 bar g	797 °F @ 827 psi g
Minimum operating temperature			0 °C	32 °F
ΔPMX	Maximum differential pressure	FTC80-45	45 bar	653 psi g
		FTC80-62	62 bar	899 psi g
		FTC80-80	80 bar	1160 psi g
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of:			150 bar g	2176 psi g

Materials

Parts 1 to 18

2" FTC80 SW (R-L) shown



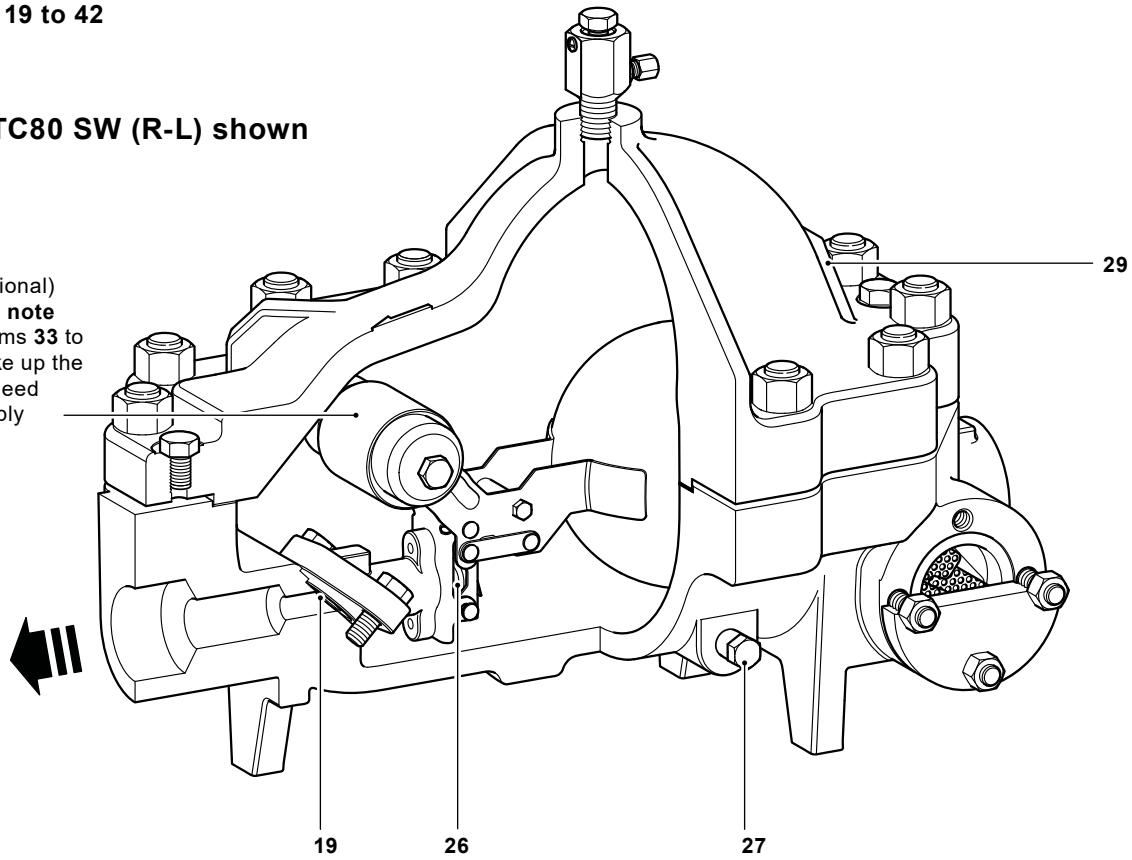
No.	Part	Material	
1	Body	Cast steel	ASTM A216 WCB
2	Cover	Cast steel	ASTM A216 WCB
3	Cover gasket	Tanged graphite	SST100
4	Cover stud	Steel	ASTM A193 B16
5	Cover nuts	Steel	ASTM A194 Gr. 4
6	Valve head and retainer	Stainless steel	
7	Strainer flange	Steel	ASTM A105N
8	Strainer screen	Stainless steel	
9	Strainer gasket	Tanged graphite	SST100
10	Strainer studs	Steel	ASTM A193 B16
11	Strainer nuts	Steel	ASTM A194 Gr. 4
12	Air vent (optional)	Stainless steel	(See BDV2 in TI-P600-01)
13	Mechanism assembly	Stainless steel	
14	Float	Stainless steel	
15	Valve seat	Titanium	
18a 18b	Assembly bolts	Stainless steel	A4-80

Materials continued on next page

Materials

Parts 19 to 42

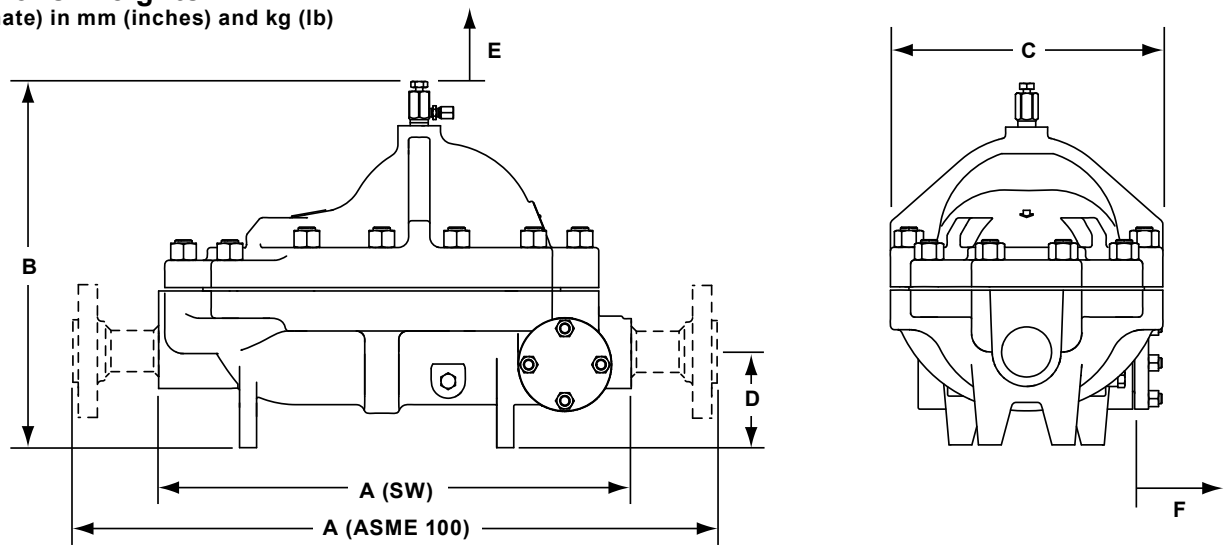
2" FTC80 SW (R-L) shown



No.	Part			Material	
19	Assembly gasket			Reinforced exfoliated graphite	
26	Gasket			Stainless steel	
27	Drain plug			Steel	ASTM A105N
28	Air vent plug (not shown)			Steel	ASTM A105N
29	Name-plate			Stainless steel	ASTM A105N
30 *	Flange pipe			Steel	ASTM A106B
31 *	Flange			Steel	ASTM A105N
32	Fixed bleed assembly	33	Bleed orifice	Stainless steel	ASTM A276 431
		34	Pipe support	Stainless steel	304 or 316
		35	Washer	Stainless steel	
		36	Lock-nut	Stainless steel	A2-70
		37	Nut	Stainless steel	316
		38	Ferrule	Stainless steel	316L
		39	Bleed pipe	Stainless steel	ASTM A269 304
		40	Stud	Stainless steel	316 S11 or S13
		41	Twin ferrule	Stainless steel	316 S11 or S13
		42	Nut	Stainless steel	316 S11 or S13

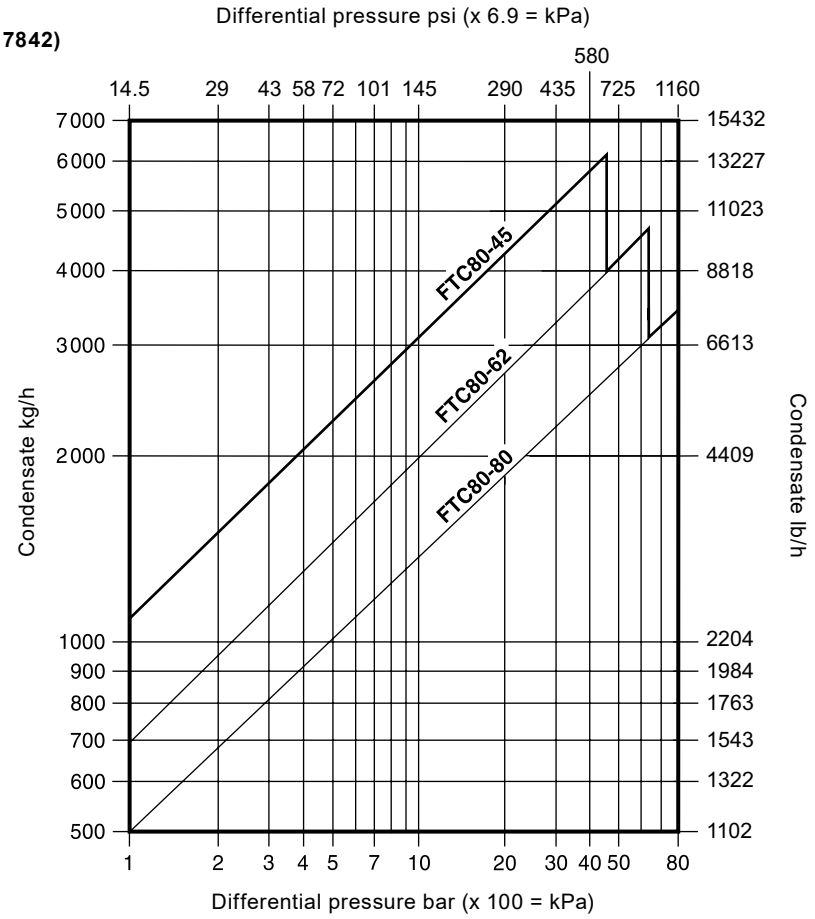
* **Note**: Items 30 and 31 the flange and flange pipe are not shown.

Dimensions / weights
(approximate) in mm (inches) and kg (lb)



Size	A		B		C	D	Withdrawal distance		Weight	
	Socket weld	Flanged ASME 600	BDV2	Plug			E Cover	F Screen	Socket weld	Flanged ASME 600
DN40 (1½")	555 (21.9 in)	755 (29.7 in)	430 (16.9 in)	390 (15.4 in)	324 (12.8 in)	110.5 (4.35 in)	55 (2.2 in)	260 (10.2 in)	112 (4.41 in)	118 (4.65 in)
DN50 (2")		785 (30.9 in)								

Capacities
(in accordance with ISO 7842)



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P179-06) supplied with the product.

Installation note

The FTC80 must be installed with the direction of flow as indicated on the body, and with the float arm in a horizontal plain so that it rises and falls vertically. Integral legs assist stable floor mounting. Please note that appropriate high temperature jointing compound must be used on the drain plug and air vent plug threads.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

Please visit the Spirax Sarco product compliance web pages
https://www.spiraxsarco.com/product-compliance
for up to date information on any substances of concern that may be contained within this product. Where no additional information is provided on the Spirax Sarco product compliance web page, this product may be safely recycled and/or disposed providing due care is taken.
Always check your local recycling and disposal regulations.

How to order

Example: 1 off Spirax Sarco 1½" FTC80-45 (R-L) ball float steam trap with ASME Class 6000 weld connections and screwed BDV2 manual air vent complete with 3.1 certification for the FTC80 and BDV2.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

Available spares

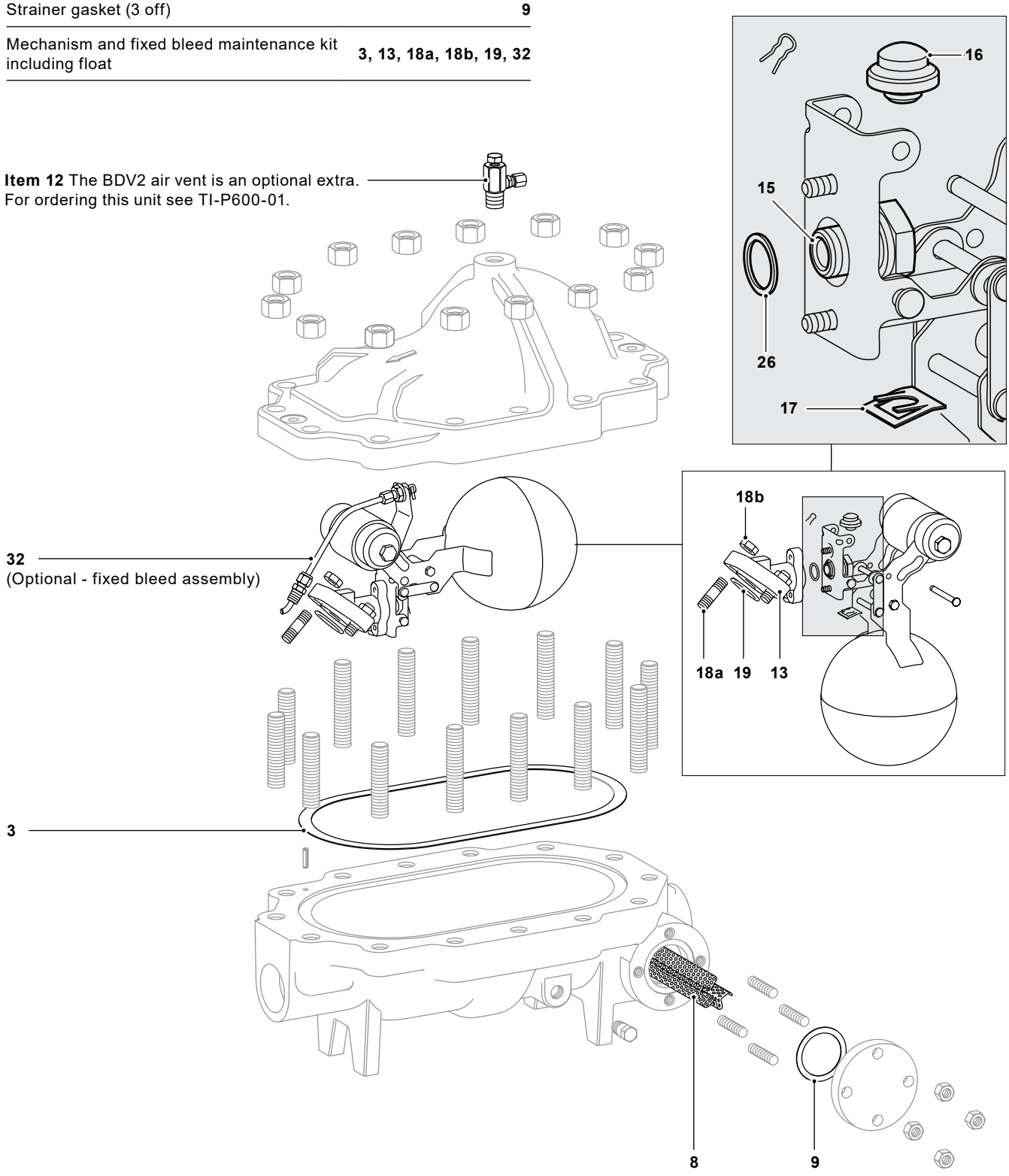
Mechanism maintenance kit, including float	**3, 13, 18a,18b, 19**
Seat and ball head	**3, 15, 16, 17, 19, 26**
Cover gasket (3 off)	**3**
Strainer screen	**8, 9**
Strainer gasket (3 off)	**9**
Mechanism and fixed bleed maintenance kit including float	**3, 13, 18a, 18b, 19, 32**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap, including pressure range.

Example: 1 off Seat and ball head set for a Spirax Sarco 1½" FTC80-45 ball float steam trap.

Item 12 The BDV2 air vent is an optional extra. For ordering this unit see TI-P600-01.



TI-P038-05-US
Issue 1

Stainless Steel Float and Thermostatic Steam Traps FTS150, FTS300

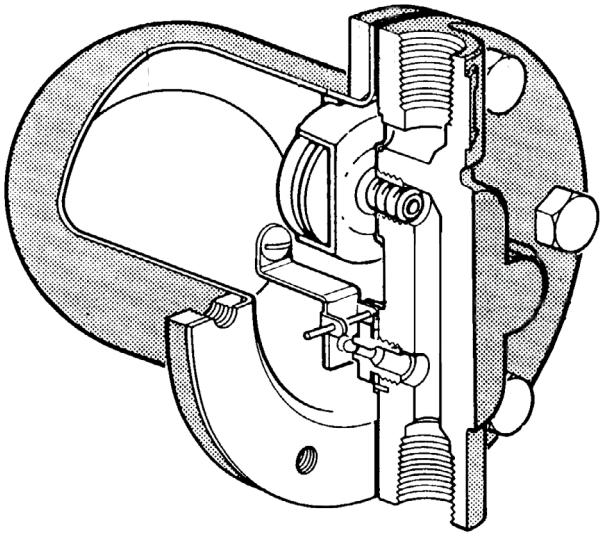
Description

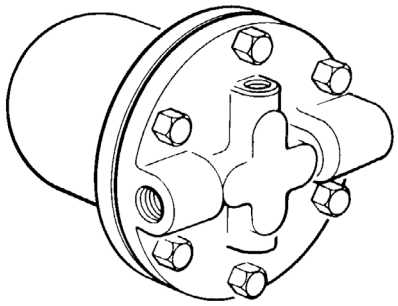
The trap contains a float valve mechanism which modulates to discharge condensate continuously at steam temperature, while non-condensible gases are released by a separate internal balanced pressure thermostatic air vent.

Model	FTS150V	FTS300V	FTS150H	FTS300H
PMO	150 psi g	300 psi g	150 psi g	300 psi g
Sizes	½" Vertical		½" Horizontal	
Connections	NPT			
Construction	Stainless Steel Cover, Body and Internals			
Options	Socket Weld to ANSI B16.11			

Typical applications

All process equipment, particularly when controlled by modulating temperature control valves, unit heaters, air heating coils, heat exchangers and steam main drip stations.





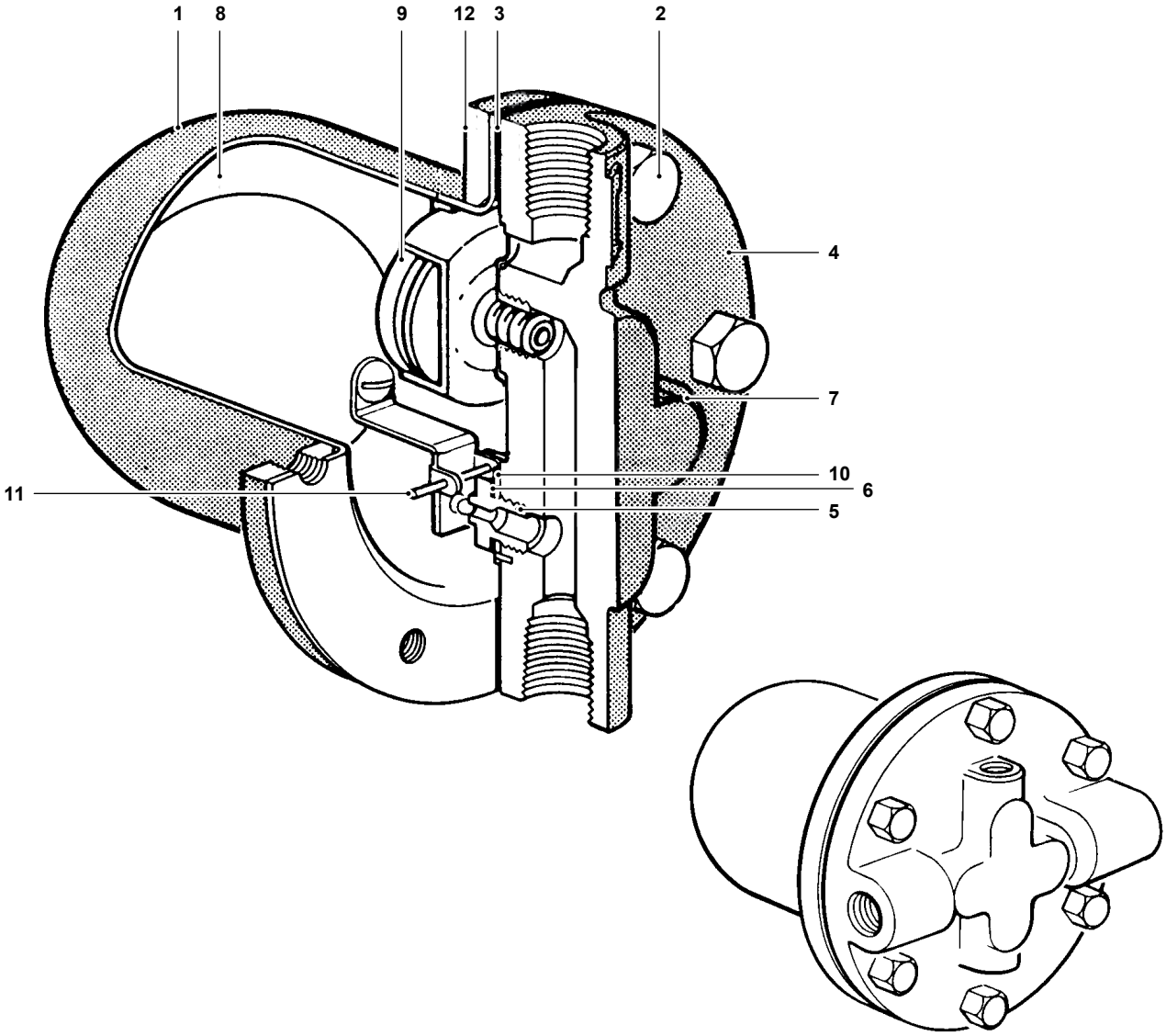
Limiting operating conditions

PMO	Maximum Operating Pressure	FTS150:	150 psi g (10 bar g)
		FTS300:	300 psi g (21 bar g)
Maximum Operating Temperature of superheat at all operating pressures			572 °F (300 °C)

Pressure shell design conditions

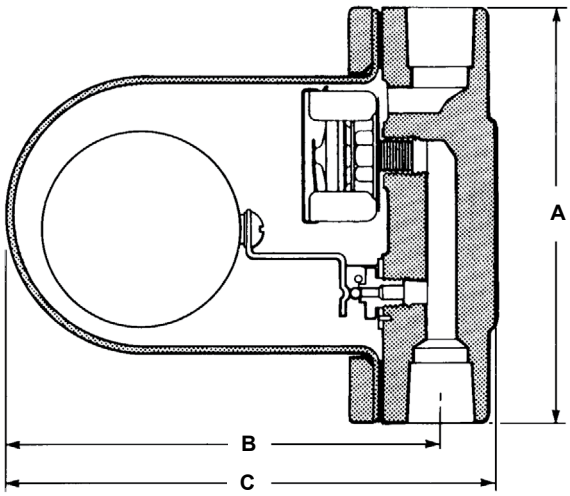
PMA	Maximum allowable pressure	450 psi g/up to 750 °F (31 bar g/up to 400 °C)
TMA	Maximum allowable temperature	750 °F/0-450 psi g (400 °C/0-31 bar g)

Materials



No.	Part	Material	
1	Body	Stainless Steel	AISI 304
2	Cover Screws	Stainless Steel	AISI 304
3	Cover Gasket	Graphite	
4	Cover	Stainless Steel	AISI 304
5	Valve Seat	Stainless Steel	
6	Valve Seat Gasket	Stainless Steel	
7	Float Screw and Washer	Stainless Steel	
8	Ball Float and Lever	Stainless Steel	
9	Air Vent Assembly	Stainless Steel	
10	Valve Seat Bracket	Stainless Steel	
11	Pivot Pin	Stainless Steel	
12	Body Retaining Ring	Stainless Steel	AISI 304

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Size	A	B	C	Weight
½"	5.3 (135)	5.4 (137)	6.1 (155)	6 lb (2.7 kg)

Capacities lb/hr hot condensate

	Inlet pressure															Orifice size
psi g (bar)	10 (.7)	15 (1.0)	20 (1.4)	25 (1.7)	30 (2.1)	40 (2.8)	50 (3.4)	75 (5.2)	100 (6.9)	125 (8.6)	150 (10.3)	175 (12.1)	200 (13.8)	250 (17.2)	300 (20.7)	
FTS150	300	350	385	420	450	500	540	625	700	760	800	–	–	–	–	.100" (2.54 mm)
FTS300	145	170	190	200	220	240	260	310	330	370	400	420	440	470	510	.070" (1.78 mm)

For kg/h multiply by .454

Sample specification

Steam traps shall be of the mechanical ball float type having stainless steel bodies and forged steel covers, NPT connections, and all stainless steel valve heads and seats. Incorporated into the trap body shall be a stainless steel balanced pressure thermostatic air vent capable of withstanding 572 °F (300 °C) temperature and resisting waterhammer without sustaining damage. Internals of the trap shall be completely servicable without disturbing the piping.

Installation

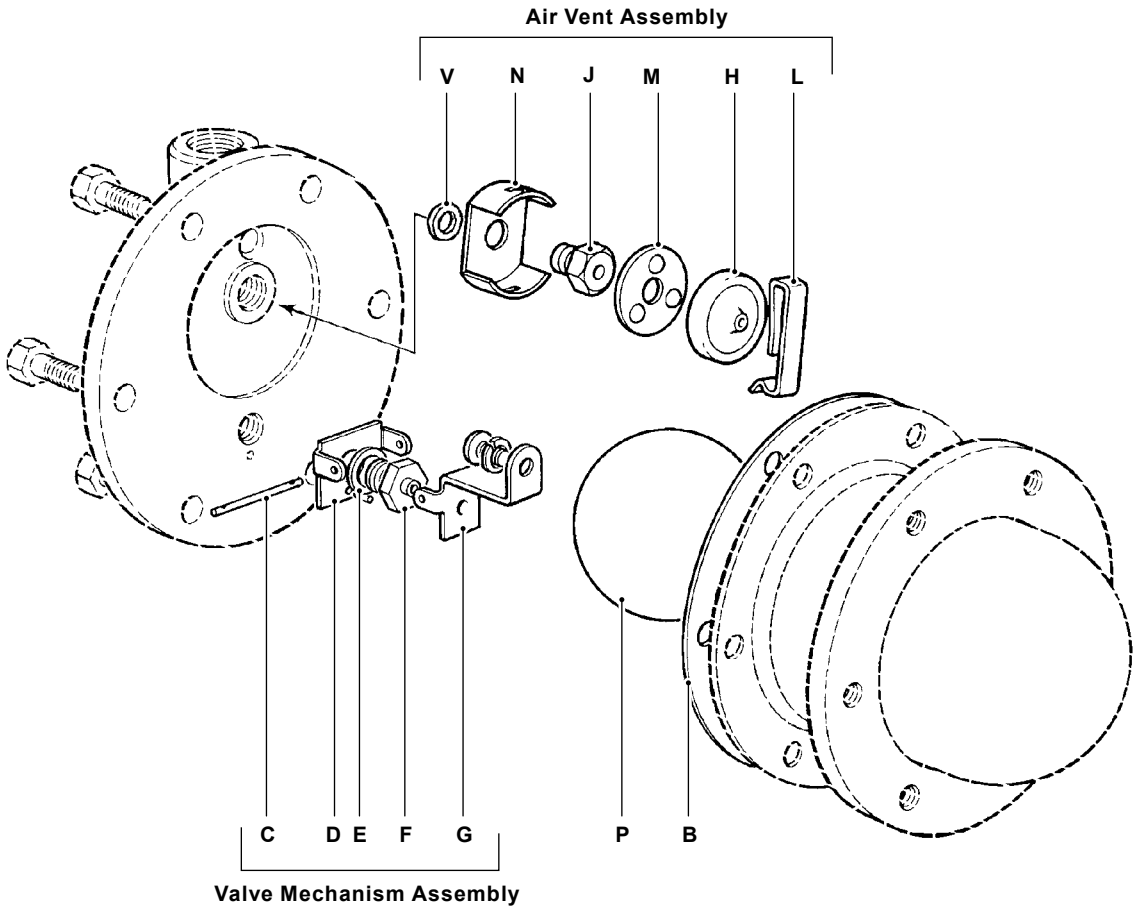
A pipeline strainer should be installed ahead of any steam trap. Full port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap, in a position so that the float arm is in a horizontal plane and the float rises and falls vertically, with the flow direction as indicated on the cover. Refer to IMI 2.300 for complete instructions.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, operating mechanism and air vent.
Worn or damaged parts should be replaced using a complete valve mechanism assembly and/or air vent assembly.
Complete installation and maintenance instructions are given in IMI 2.300, which accompanies the product.

Spare parts

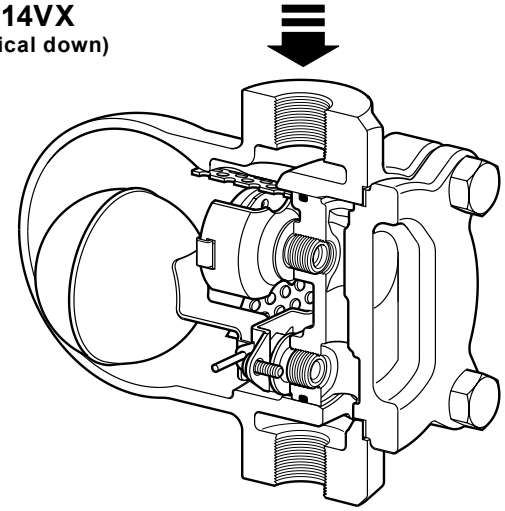
Gasket Kit (3 of each)	**B, F**
Air Vent Kit	**H, J, L, M, N, V**
Valve Mechanism Kit	**C, D, E, F,G**
Float Kit	**P**



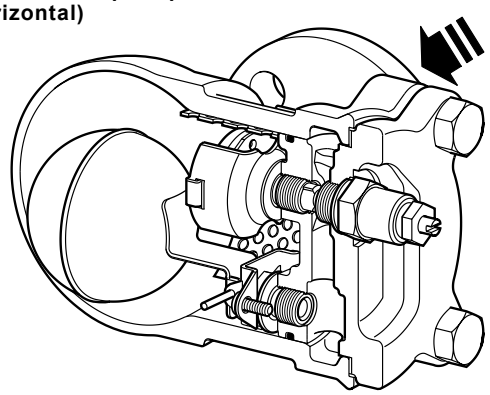
TI-P145-01
CMGT Issue 8

FTS14
Austenitic Stainless Steel Ball Float Steam Trap

FTS14VX
(Vertical down)



FTS14X-C (R-L)
(Horizontal)



Description

The FTS14 is an austenitic stainless steel ball float steam trap with an integral automatic air vent.
It provides efficient condensate drainage and prompt air removal to ensure process equipment operates to its maximum potential.
As standard the FTS14 has horizontal connections with flow from right to left (R-L). However its unique design allows the cover to be simply rotated to provide horizontal left to right (L-R) and vertical up or vertical down configurations.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

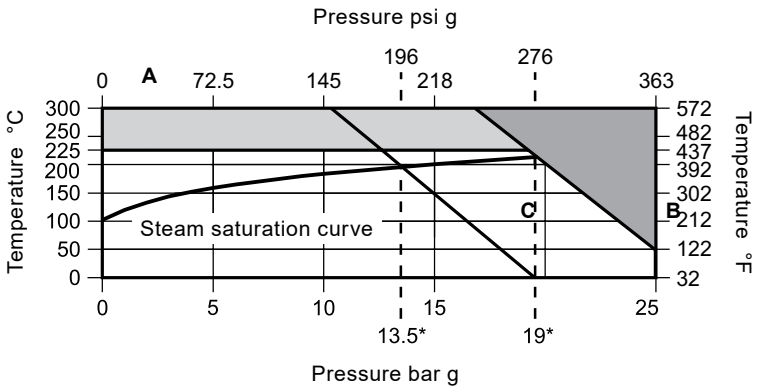
½", ¾" and 1"	Screwed BSP T Rp (ISO 7-1) (BS 21 and DIN 2999) or NPT (ASME B 1.20.1).
½", ¾" and 1"	Socket weld ends to ASME B 16.11, BS 3799 Class 3000 and DIN 3239
DN15, 20 and 25	Flanged ends to ASME B 16.5 Class 150 and 300 or EN 1092-1 PN16or PN25.
½", ¾" and 1"	Tri-clamp ends (FTS14-4.5 only).

Note: For alternative connections please consult Spirax Sarco.

Optional extras

Internal strainer (**FTS14X**). A manually adjustable needle valve can be added for use as a steam lock release mechanism (**FTS14-C**).
The cover can be tapped ⅛" BSP T Rp (ISO 7-1) for installation of a temperature sensor.
Note: All options are available at extra cost.

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

A - B Flanged PN16, PN25, ASME 300, screwed and socket weld.

A - C Flanged ASME 150.

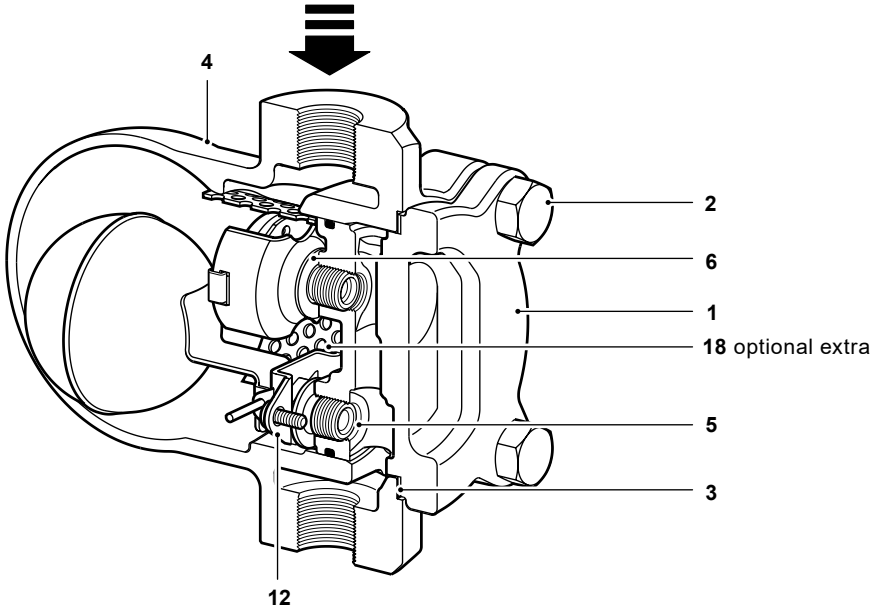
Note: Tri-clamp compatible end connections, used for hygienic / sanitary applications, are only available on the FTS14-4.5.

Body design conditions				PN25
PMA	Maximum allowable pressure		25 bar g @ 50 °C	363 psi g @ 122 °F
TMA	Maximum allowable temperature		300 °C	572 °F
Minimum allowable temperature			-20 °C	-4 °F
PMO	Maximum operating pressure for saturated steam service	**A - B**	19 bar g	276 psi g
		A - C	13.5 bar g	196 psi g
TMO	Maximum operating temperature		225 °C @ 19 bar g	437 °F @ 276 psi g
Minimum operating temperature			0 °C	32 °F
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of:			37.5 bar g	544 psi g
ΔPMX	Maximum differential pressure	**FTS14-4.5**	4.5 bar	65 psi
		FTS14-10	10 bar	145 psi
		FTS14-14	14 bar	203 psi

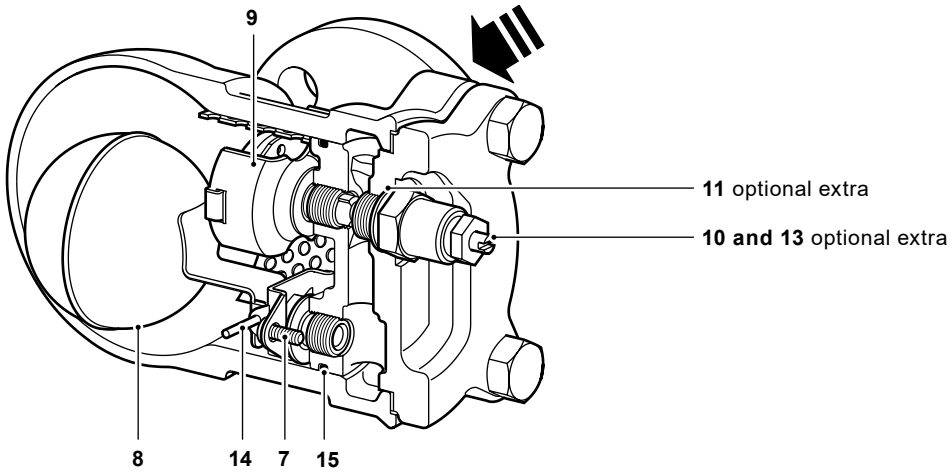
Note: For lower operating temperatures consult Spirax Sarco.

Materials

FTS14VX
(Vertical down)



FTS14X-C (R-L)
(Horizontal)



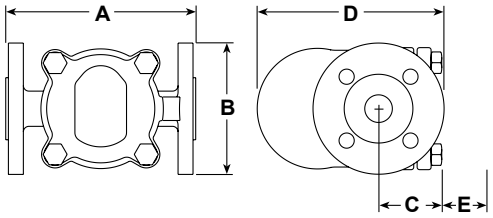
No.	Part	Material	
1	Body	Austenitic stainless steel (316)	EN 10213-4 (1.4408) ASTM A351 CF8M
2	Cover bolts	Stainless steel	BS EN 3506 A2-70
3	Cover gasket	Reinforced exfoliated graphite	
4	Cover	Austenitic stainless steel (316)	EN 10213-4 (1.4408) AS A351 CF8M
5	Main valve seat	Stainless steel	BS 970 431 S29
6	Main valve/air vent seat gasket	Stainless steel	
7	Main valve assembly screws	Stainless steel	
8	Ball float and lever	Stainless steel	BS 1449 304 S16

No.	Part	Material	
9	Air vent assembly	Stainless steel	
10	SLR assembly	Stainless steel	
11	SLR gasket	Stainless steel	
12	Pivot frame	Stainless steel	
13	SLR seal	Graphite	
14	Pivot	Stainless steel	
15	'O' ring	Grey Viton complies with FDA CFR Title 21, Para 177, Section 2600	
16	Valve spring (1" only)	Stainless steel	
17*	Sensor blanking plug	Stainless steel	(optional extra)
18*	Strainer screen	Stainless steel	(optional extra)

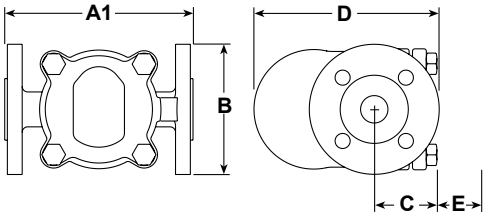
***Note: Items 16 and 17 cannot be shown.**

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

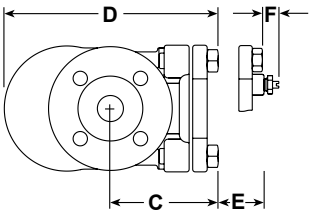
Screwed, Socket weld and Tri-clamp ends (all sizes)



Flanged DN25 (1")

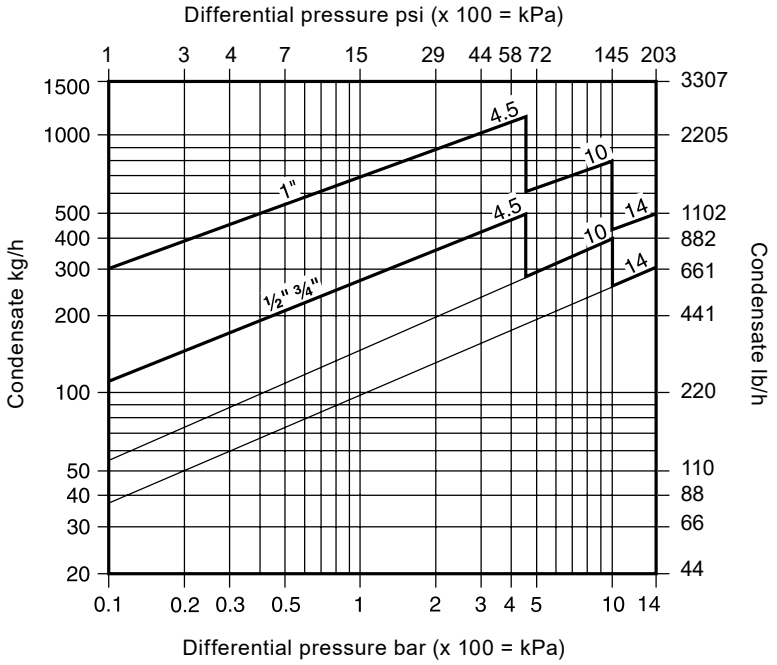


Flanged DN15, DN20 (½", ¾") and FTS14-C



Size	A		A1			B	C	D	E	F	Weight	
	Screwed / SW	Tri-clamp	PN16/25	ASME 150	ASME 300				Withdrawal distance	FTS14-C	Screwed / SW	Flanged
½"	135 (5.31)	180 (7.09)	-	-	-	97 (3.82)	48 (1.89)	162 (6.38)	135 (5.31)	22 (0.87)	3.75 (8.27)	-
¾"												
1"	139 (5.47)	200 (7.87)	-	-	-	113 (4.45)	51 (2.01)	179 (7.05)	145 (5.71)		4.25 (9.37)	-
DN15	-	-	150 (5.91)	147 (5.79)	194 (7.64)	97 (3.82)	77 (3.03)	162 (6.38)	135 (5.31)		-	5.00 (11)
DN20												
DN25	-	-	160 (6.30)	160 (6.30)	204 (8.03)	113 (4.45)	62 (2.44)	179 (7.05)	145 (5.71)		-	6.25 (13.78)

Capacities



Note. Capacities shown are based on discharge at saturation temperature. When discharging sub-cooled condensate the air vent provides extra capacity. Under start-up conditions the thermostatic air
vent will be open, and will provide additional condensate capacity to the main valve assembly. On 4.5 bar units this will provide a minimum of 50% increased capacity above the hot condensate figures shown.
On 10 and 14 bar (145 and 203 psi) units this will be a minimum increase of 100% on the published capacity.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P145-02) supplied with the product.

How to order

Example: 1 off Spirax Sarco ½" FTS14X-4.5 R-L (right to left) stainless steel float trap fitted with screwed BSP T Rp (ISO 7-1) connections. Trap is maintainable in line. Fitted with integral air vent and strainer screen.

Spare parts

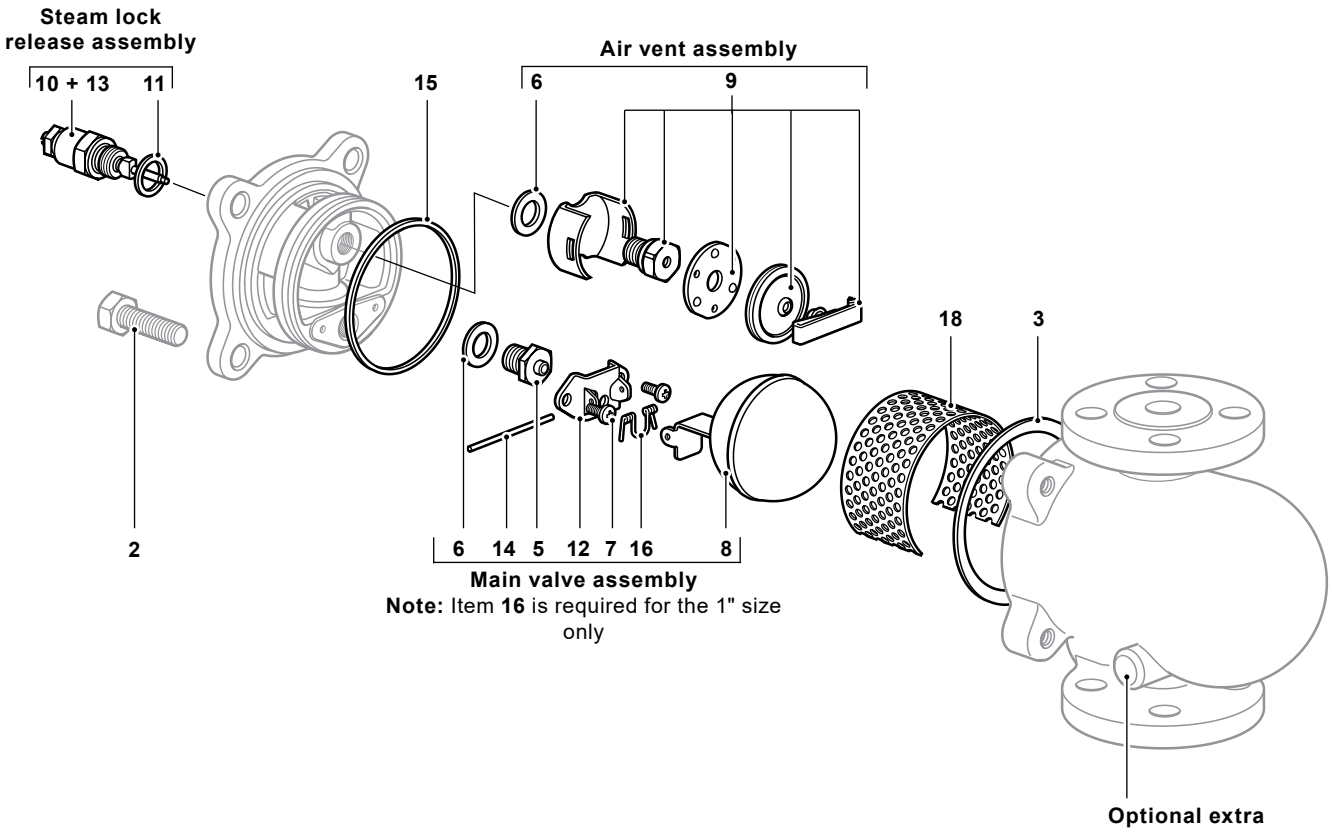
The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Maintenance kit	**3**, **5**, **6** (2 off), **7** (2 off), **8**, **9**, **12**, **14**, **15**, **16** (1" only), **18**
Gasket set (packet of 3)	**3, 15**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, type of trap and pressure range. i.e. 4.5, 10 or 14 bar.
Example: 1 - Maintenance kit for a Spirax Sarco ½" FTS14-4.5 steam trap.



Note: Item **16** is required for the 1" size only

At extra cost the cover can be tapped ⅛" BSP T Rp (ISO 7-1) for installation of a temperature sensor.

Recommended tightening torques

Item	Part	or mm		N m	(lbf ft)
2	Cover bolts		M10 x 30	20 - 25	(15 - 18)
5	Main valve seat	17 A/F		50 - 55	(37 - 41)
7	Main valve assembly screws	pozidrive	M4 x 6	2.5 - 3.0	(1.5 - 2)
9	Air vent assembly	17 A/F		50 - 55	(37 - 41)
10	SLR assembly, gasket and seal	19 A/F		35 - 40	(26 - 30)
17	Sensor blanking plug	11 A/F		15 - 20	(11 - 15)

TI-P605-01
CMGT Issue 3

FTS23 Stainless Steel Body and Cover FTC23 Carbon Steel Body with Stainless Steel Cover Ball Float Steam Traps

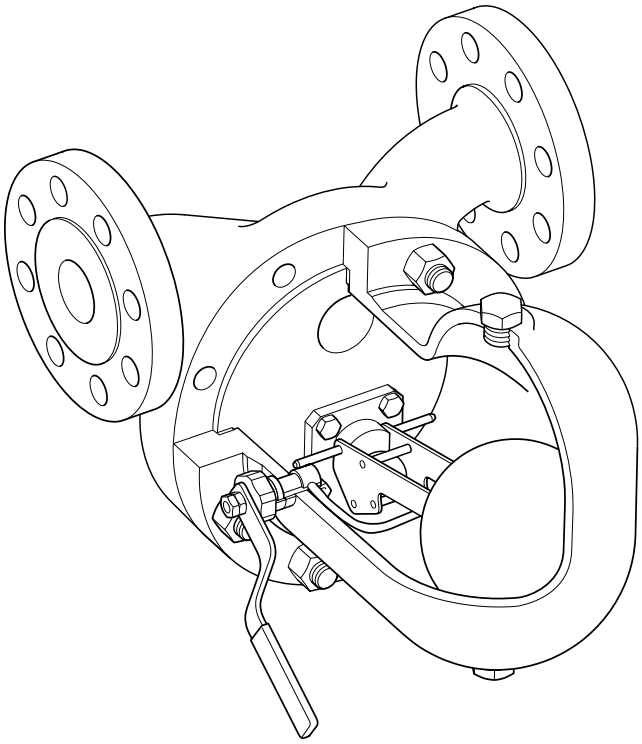
Description

FT_23 ball float steam traps are suitable for use with saturated and superheated steam, on process equipment, and the first choice for drainage of temperature controlled systems.

They are the perfect choice in solving problems caused by steam that is carrying solid and incondensable contaminants such as salts and gasses; These quickly lead to fouling and the accumulation of sediment and debris, resulting in failure of the internal mechanism. They are typically used on geothermal steam.

The main design feature is the innovative self-cleaning float closing mechanism, which allows automatic safe operation even in cases of severe steam contamination. Furthermore, the position and size of the main valve and seat makes it easier for the discharge of condensate and solid contaminant. The trap is able to modulate the condensate flow adapting immediately to sudden and large variations of flow and pressure.

Another key feature of the unit is the external manual lever that allows the valve ball to be fully opened regardless of the presence or absence of condensate in the unit - This facilitates the fast removal of any sediment/condensate that may be in the unit and easier inspection in maintaining optimum performance of the internal mechanism.



Available types

FTS23-07	Stainless steel body, cover and internals	PMO	7 bar g (102 psi g)
FTS23-23		PMO	23 bar g (334 psi g)
FTC23-07	Carbon steel body with Stainless steel cover and internals	PMO	7 bar g (102 psi g)
FTC23-23		PMO	23 bar g (334 psi g)

Standards

These products fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU and carry the CE mark when so required.

Approvals

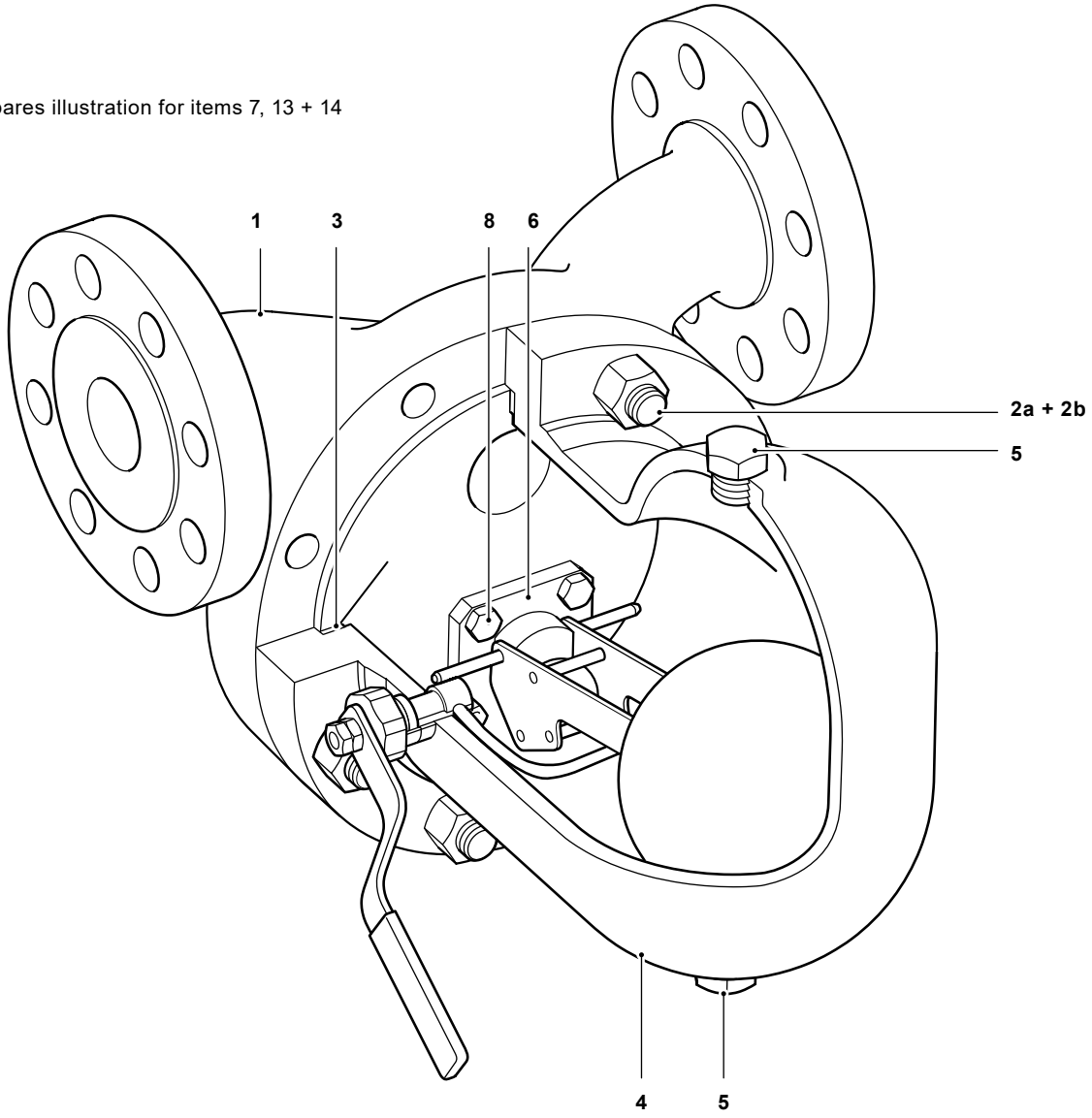
These products are available with a manufacture's Typical Test Report or Certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

DN25, DN40 and DN50	Flanged EN 1092 PN40
1½" and 2"	Flanged ASME B16.5 Class 150
	Flanged ASME B16.5 Class 300

Materials

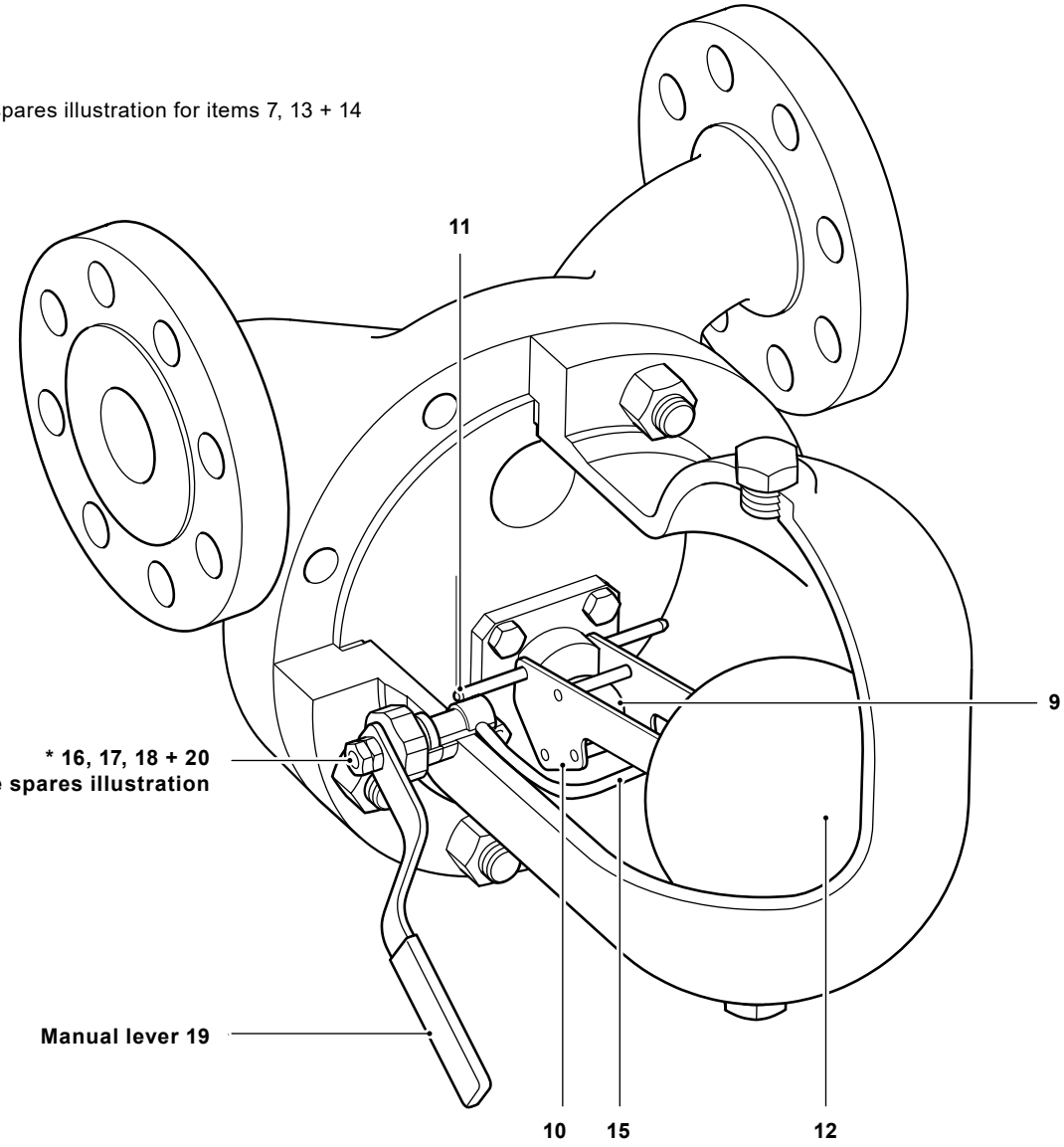
*** Please note**
For clarity see the spares illustration for items 7, 13 + 14



No.	Part	Material	
1	Body	Carbon steel	ASTM A216 WCB
		Stainless steel	ASTM A351 CF8 (on request)
2a	Cover studs	Carbon steel	ASTM A193 B7
		Stainless steel	ASTM A193 B8 Cl.1
2b	Cover nuts	Carbon steel	ASTM A 194 Gr. 2H
		Stainless steel	ASTM A194 Gr.8
3	Cover gasket	Exfoliated graphite reinforced steel	
4	Cover	Stainless steel	ASTM A351 CF8
5	Cover plug (½")	Carbon steel	ASTM A105
6	Valve seat	Stainless steel	ASTM A479 316
7 *	Valve seat gasket	Exfoliated graphite reinforced steel	
8	Valve assembly screws	Stainless steel	AISI 304

Materials (continued)

*** Please note**
For clarity see the spares illustration for items 7, 13 + 14

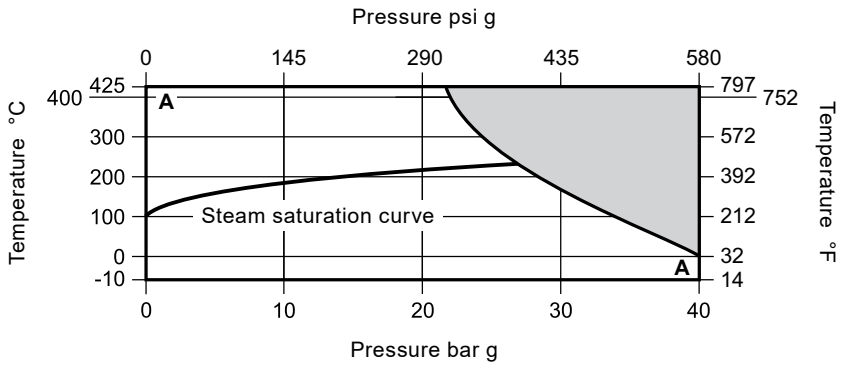


No.	Part	Material	
9	Valve ball	Stainless steel	AISI 316
10	Float lever	Stainless steel	ASTM A240 316
11	Float lever pin	Stainless steel	ASTM A479 316
12	Float	Stainless steel	AISI 316
13 *	Washer	Stainless steel	AISI 304
14 *	Screw	Stainless steel	AISI 304
15	Internal lever	Stainless steel	AISI 316
16 *	Graphite packing seals	Graphite	Graphite
17 *	Spacer	Stainless steel	AISI 316
18 *	Gland nut	Stainless steel	AISI 316
19	Manual lever	Stainless steel	ASTM A240 304
20 *	Nut and lock-nut	Stainless steel	AISI 304

FTS23 - Pressure/temperature limits (ISO 6552)

Stainless steel body and cover

Flanged PN40



The product **must not** be used in this region.

A - A Flanged PN40

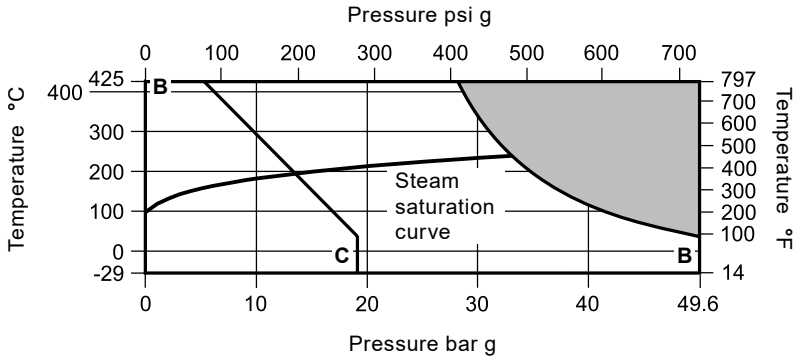
Body design conditions				PN40
PMA	Maximum allowable pressure		40 bar g @ 0 °C	580 psi g @ 32 °F
TMA	Maximum allowable temperature		425 °C @ 21.7 bar g	797 °F @ 315 psi g
Minimum allowable temperature			-10 °C	14 °F
PMO	Maximum operating pressure	FTS23-07	7 bar g @ 425 °C	102 psi g @ 797 °F
		FTS23-23	23 bar g @ 350 °C	334 psi g @ 662 °F
TMO	Maximum operating temperature		425 °C @ 21.7 bar g	662 °F @ 315 psi g
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
ΔPMX	Maximum differential pressure	FTS23-07	7 bar	102 psi
		FTS23-23	23 bar	334 psi
Designed for a maximum cold hydraulic test pressure of:			60 bar g	870 psi

Please note that the trap in its complete operational form must not be subjected to pressures greater than 40 bar g (580 psi g) as damage to the internals may occur.

FTS23 - Pressure/temperature limits (ISO 6552)

Stainless steel body and cover

Flanged ASME 150 and Flanged ASME 300



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

B - B Flanged ASME 300

B - C Flanged ASME 150

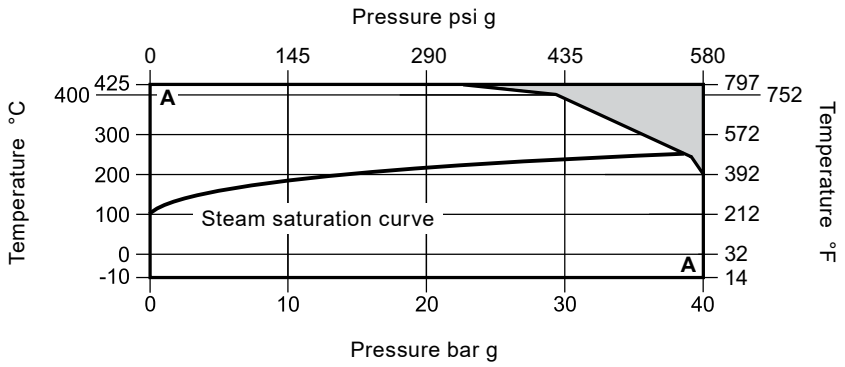
Body design conditions				ASME 150 or ASME 300
PMA Maximum allowable pressure	ASME 300		49.6 bar g @ 38 °C	719 psi g @ 100 °F
	ASME 150		19 bar g @ 38 °C	275 psi g @ 100 °F
TMA Maximum allowable temperature	ASME 300		425 °C @ 28 bar g	797 °F @ 406 psi g
	ASME 150		425 °C @ 5.5 bar g	797 °F @ 79 psi g
Minimum allowable temperature			-10 °C	14 °C
PMO Maximum operating pressure	ASME 300	**FTS23-07**	7 bar g @ 425 °C	102 psi g @ 797 °F
		FTS23-23	23 bar g @ 425 °C	334 psi g @ 797 °F
	ASME 150	**FTS23-07**	7 bar g @ 386 °C	102 psi g @ 726 °F
		FTS23-23	13 bar g @ 194 °C	188 psi g @ 381 °F
TMO Maximum operating temperature	ASME 300		425 °C @ 28 bar g	797 °F @ 406 psi g
	ASME 150		425 °C @ 5.5 bar g	797 °F @ 79 psi g
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
ΔPMX Maximum differential pressure		**FTS23-07**	7 bar	102 psi
		FTS23-23	23 bar	334 psi
Designed for a maximum cold hydraulic test pressure of:	ASME 300		75 bar g	1 088 psi g
	ASME 150		28.5 bar g	413 psi g

Please note that the trap in its complete operational form must not be subjected to pressures greater than 40 bar g (580 psi g) as damage to the internals may occur.

FTC23 - Pressure/temperature limits (ISO 6552)

Carbon steel body with Stainless steel cover

Flanged PN40



The product **must not** be used in this region.

A - A Flanged PN40

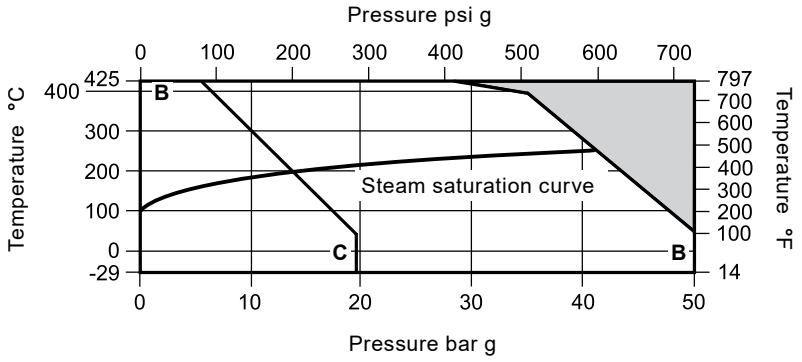
Body design conditions				PN40
PMA	Maximum allowable pressure		40 bar g @ 200 °C	580 psi g @ 392 °F
TMA	Maximum allowable temperature		425 °C @ 22.8 bar g	797 °F @ 331 psi g
Minimum allowable temperature			-10 °C	14 °F
PMO	Maximum operating pressure	FTC23-07	7 bar g @ 425 °C	102 psi g @ 797 °F
		FTC23-23	23 bar g @ 425 °C	334 psi g @ 797 °F
TMO	Maximum operating temperature		425 °C @ 22.8 bar g	797 °F @ 331 psi g
Minimum operating temperature Note: For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
ΔPMX	Maximum differential pressure	FTC23-07	7 bar	102 psi
		FTC23-23	23 bar	334 psi
Designed for a maximum cold hydraulic test pressure of:			60 bar g	870 psi

Please note that the trap in its complete operational form must not be subjected to pressures greater than 40 bar g (580 psi g) as damage to the internals may occur.

FTC23 - Pressure/temperature limits (ISO 6552)

Carbon steel body with Stainless steel cover

Flanged ASME 150 and Flanged ASME 300



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

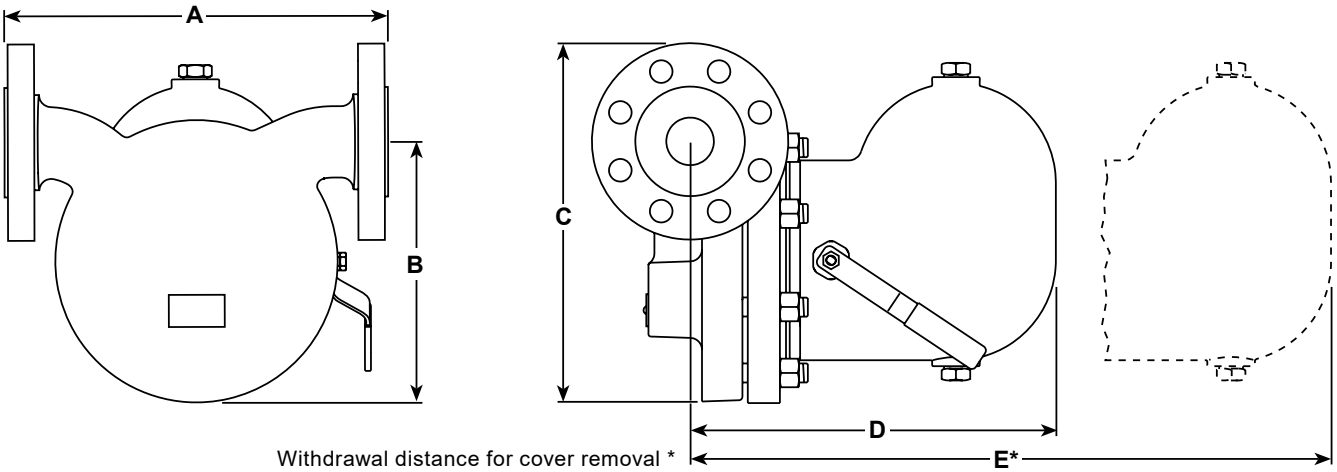
B - B Flanged ASME 300

B - C Flanged ASME 150

Body design conditions				ASME 150 or ASME 300
PMA Maximum allowable pressure	ASME 300		50 bar g @ 50 °C	725 psi g @ 122 °F
	ASME 150		19.6 bar g @ 38 °C	284 psi g @ 100 °F
TMA Maximum allowable temperature	ASME 300		425 °C @ 28.8 bar g	797 °F @ 417 psi g
	ASME 150		425 °C @ 5.5 bar g	797 °F @ 79 psi g
Minimum allowable temperature			-10 °C	14 °C
PMO Maximum operating pressure	ASME 300	FTC23-07	7 bar g @ 425 °C	102 psi g @ 797 °F
		FTC23-23	23 bar g @ 425 °C	334 psi g @ 797 °F
	ASME 150	FTC23-07	7 bar g @ 386 °C	102 psi g @ 726 °F
		FTC23-23	13 bar g @ 194 °C	188 psi g @ 381 °F
TMO Maximum operating temperature	ASME 300		425 °C @ 28.8 bar g	797 °F @ 417 psi g
	ASME 150		425 °C @ 5.5 bar g	797 °F @ 79 psi g
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
DPMX Maximum differential pressure		FTC23-07	7 bar	102 psi
		FTC23-23	23 bar	334 psi
Designed for a maximum cold hydraulic test pressure of:	ASME 300		75 bar g	1 088 psi g
	ASME 150		30 bar g	435 psi g

Please note that the trap in its complete operational form must not be subjected to pressures greater than 40 bar g (580 psi g) as damage to the internals may occur.

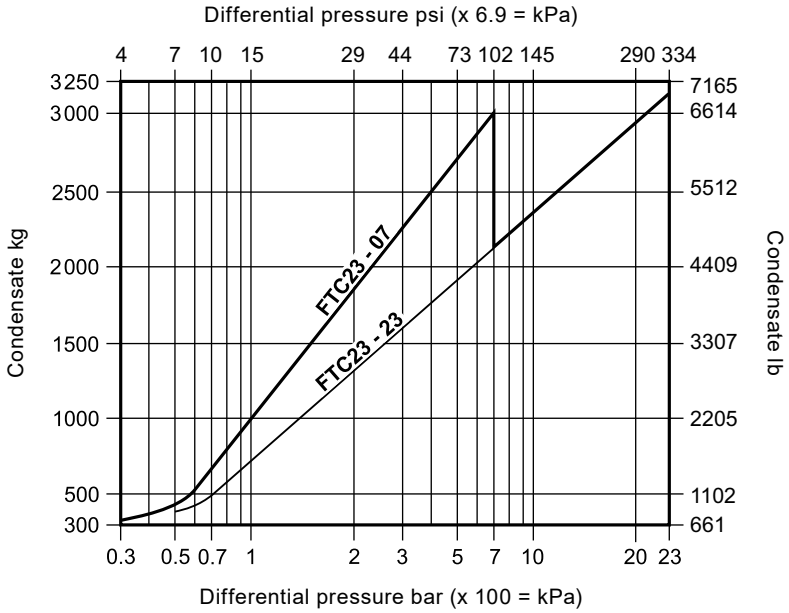
Dimensions / weights (approximate) in mm (in) and kg (lb)



Size		A	B	C	D	E*	Weight
DN25, **DN40** and **DN50**	**PN40 flanged**	320 (12.6)	220 (8.7)	305 (12)	310 (12.2)	560 (22)	40 (88)
1½" and **2"**	**ASME flanged**						

Capacities

The condensate discharge capacities are based on the actual temperature of operation.



The choice of trap should be based on the following data:

- Hourly amount of condensate to be discharged
- Effective differential pressure

Safety factors:

- 1.25 ÷ 1.5 with continuous duty
- 2 ÷ 3 with intermittent duty

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P605-02) supplied with the product.

Installation note

FT_23 ball float steam traps must be installed below the draining point with the direction of flow as indicated on the body and with the float lever positioned in a horizontal plane so that it rises and falls freely. For optimum working conditions and protection of the unit it is recommended that a strainer be installed upstream to prevent possible damage to the internal mechanism and to ensure peak operation within your plant.

In order to allow simple and safe inspection for cleaning or maintenance purposes install suitable isolation valves. If the trap is to discharge to atmosphere ensure that it is to a safe place, the discharged medium may be at a temperature of 100 °C. In order to ensure an efficient discharge of incondensable medium, it is recommended that a balance line be connected to a drain system (reference the Installation and Maintenance Instructions that are supplied with the unit).

Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.
In the event that, during the operation, the trap comes into contact with harmful substances, you will need to dispose of it in accordance with regulations under the current legislation.

How to order

Example: 1 off Spirax Sarco DN50 FTC23-23 carbon steel ball float steam trap with flanged EN 1092 PN40 connections.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

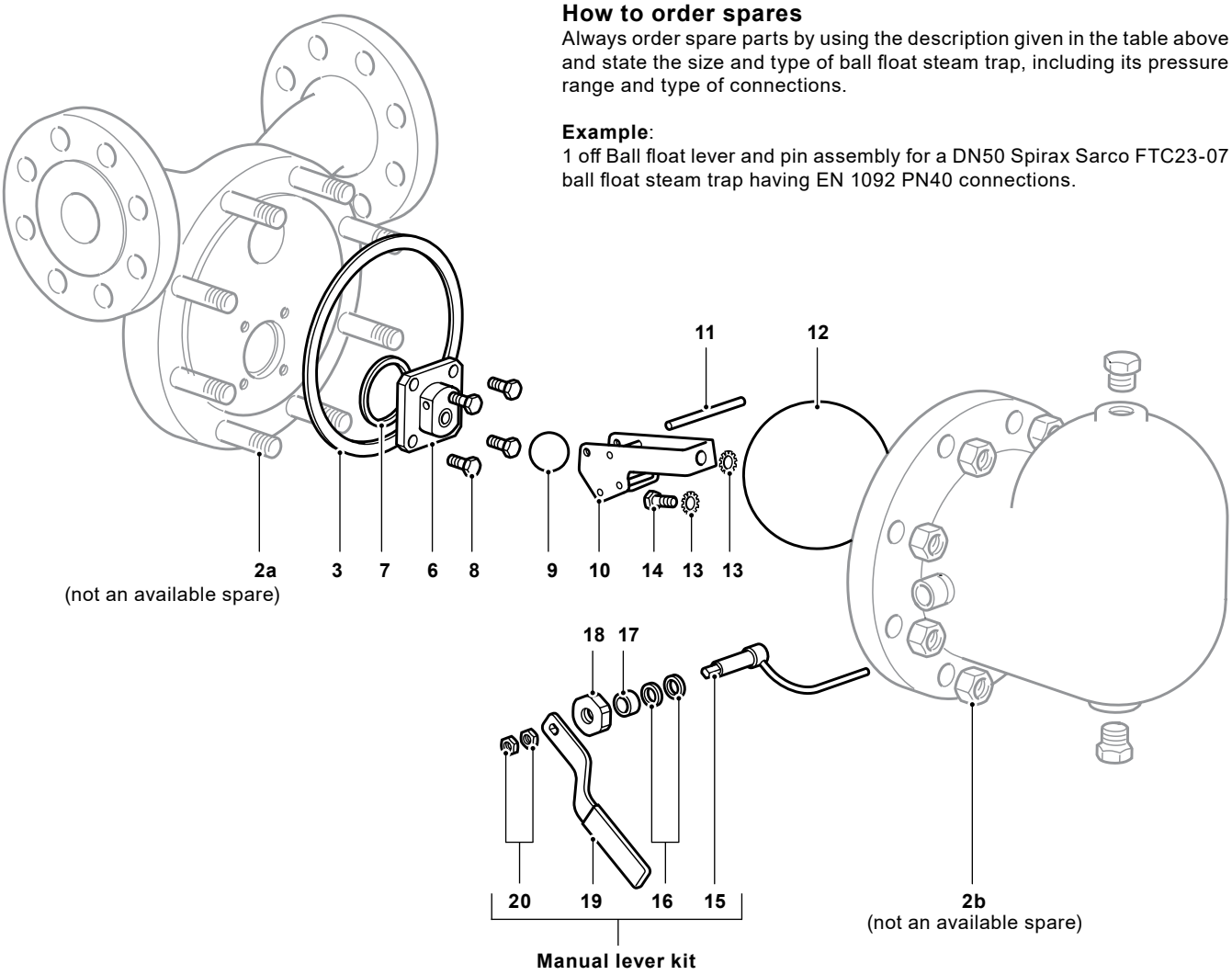
Available spares

Valve seat assembly	**6, 8**
Valve ball	**9**
Ball float lever and pin assembly	**10, 11**
Float assembly	**12, 13, 14**
Manual lever kit	**15, 16, 17, 18, 19, 20**
Stuffing box and manual lever spacer assembly	**16, 17**
Gasket set (3 + 3 units)	**3, 7**

How to order spares

Always order spare parts by using the description given in the table above and state the size and type of ball float steam trap, including its pressure range and type of connections.

Example:
1 off Ball float lever and pin assembly for a DN50 Spirax Sarco FTC23-07 ball float steam trap having EN 1092 PN40 connections.



Recommended tightening torques

Model	Item no.	Quantity	Part	mm	or	N m	ft-lbf
FTC23	**2a**	8	Cover studs		M16 x 70		
	2b	8	Cover nuts	24		80	59
	8	4	Valve assembly screws	13	M8 x 20	19	14
FTS23	**2a**	12	Cover studs		M16 x 70		
	2b	12	Cover nuts	24		40	30
	8	4	Valve assembly screws	13	M8 x 20	19	14

TI-S01-04-US
Issue 1

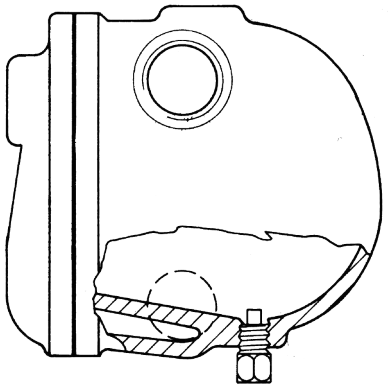
Mod. 2000 Self Drainage Unit For Float and Thermostatic Trap to prevent freeze up

Description

The drainage device is to be used on the bottom drain connection on Float and Thermostatic steam traps or drain traps in outdoor installations where freezing may occur.

When the pressure drops below 3 psi g (0.21 bar g) the device opens to completely drain the trap body. The unit will close at pressures above 3 psi g (0.21 bar g).

Model	Mod.2000
PMO	464 psi g (32 bar g)
Size	⅜"
Connections	NPT
Construction	Tamperproof stainless steel



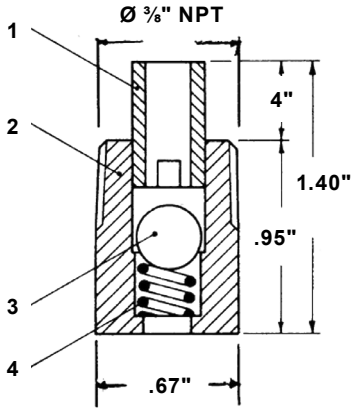
Float and Thermostatic style steam trap with Mod. 2000 drainage device

Pressure shell design conditions

PMA	Maximum Allowable Pressure	464 psi g	(32 bar g)
TMA	Maximum Allowable Temperature	482 °F	(250 °C)
PMO	Maximum Operating Pressure	464 psi g	(32 bar g)
PMO	Maximum Operating Temperature	482 °F	(250 °C)
Minimum Closer Pressure		3.6 psi g	(.25 bar g)
Opening pressure		3 psi g	(0.2 bar g)

Materials

No.	Part	Material
1	Sleeve	Stainless Steel
2	Body with integral seat	
3	Ball valve	
4	Spring	



Installation

Thread the Mod. 2000 into the drain connection on the bottom of the F&T trap. Most, but not all, have ⅜" connections. Bush down to ⅜" NPT if connection on the trap is larger.
This device will automatically open and drain when the steam trap pressure drops below 3 psi g; so, it should not drain in an area where it could dump hot condensate onto personnel.
If the trap is where drainage may cause a danger, an open funnel drain with a 1" air gap should be placed under the Mod.2000 to drain condensate to a safe place.
Reference IM-2-323-US.

TI-P063-01-US
Issue 1

Balanced Pressure Thermostatic Steam Traps
RTA-125, RTH-125, RTV-125

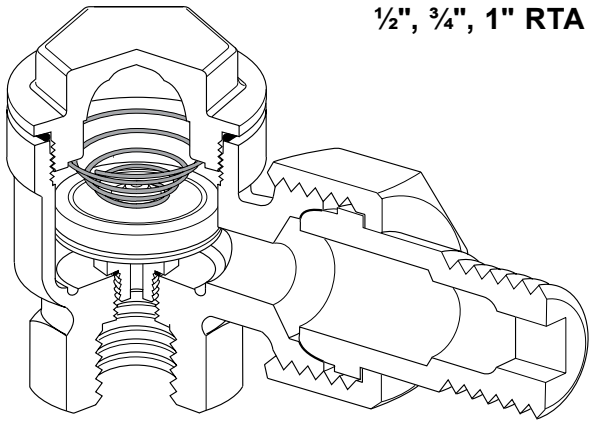
Description

The balanced pressure steam trap contains a welded stainless steel element which is self-adjusting over the entire operating pressure range and approximately 23 °F (-5 °C) below saturated steam temperature.

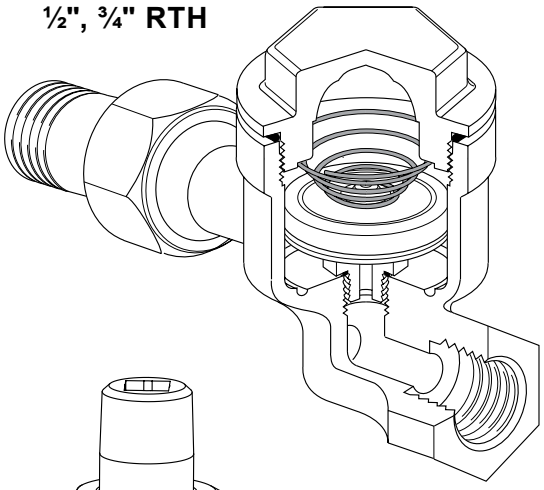
Traps in this series are replacements for:
TA-125, TH-125, T-25, TB-25, TS-25, T-65, T-125; 1"H, N-100 angle; H, S-65, N-100 straightway and vertical, TV-125.

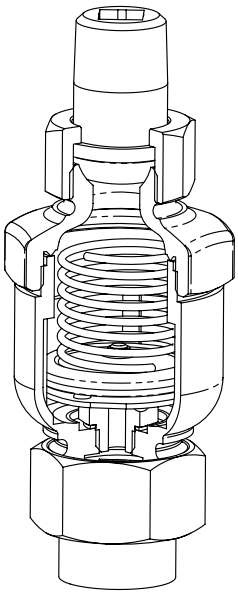
Model	RTA-125	RTH-125	RTV-125
	Angle	Straightway	Vertical
PMO	125 psi g	125 psi g	125 psi g
Sizes	½", ¾" and 1"	½" and ¾"	½" and ¾"
Connections	NPT — male union inlet NPT — female outlet		
Construction	Brass body with stainless steel internals		
Option	Extended male inlet spud (½", ¾" RTA-125 only) Near to steam fill 11 °F (-11.7 °C) All		

½", ¾", 1" RTA



½", ¾" RTH





½", ¾", RTV

Typical applications

Vapor or vacuum two-pipe heating systems, radiators, convectors, fintube, hospital blanket warmers, sterilizers and stills, laundry and kitchen equipment, and small process equipment.

Limiting operating conditions

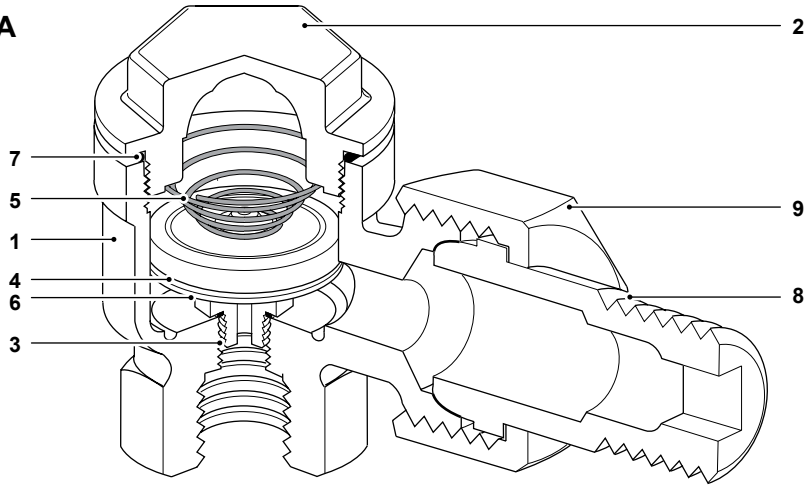
PMO	Maximum operating pressure	125 psi g (8.6 bar g)
Maximum operating temperature		Saturated steam temperature
Minimum operating pressure		25" Hg Vacuum

Pressure shell design conditions

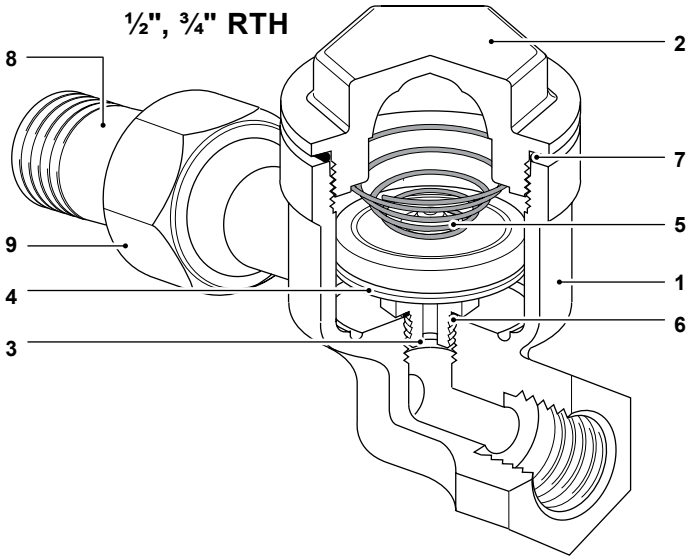
PMA	Maximum allowable pressure	125 psi g/up to 353 °F (8.6 bar g/up to 178 °C)
TMA	Maximum allowable temperature	353 °F/0-125 psi g (178 °C/0-8.6 bar g)

Materials

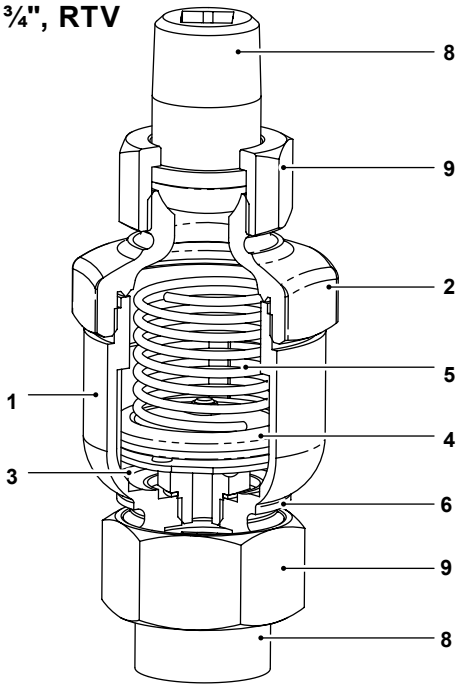
½", ¾", 1" RTA



½", ¾" RTH

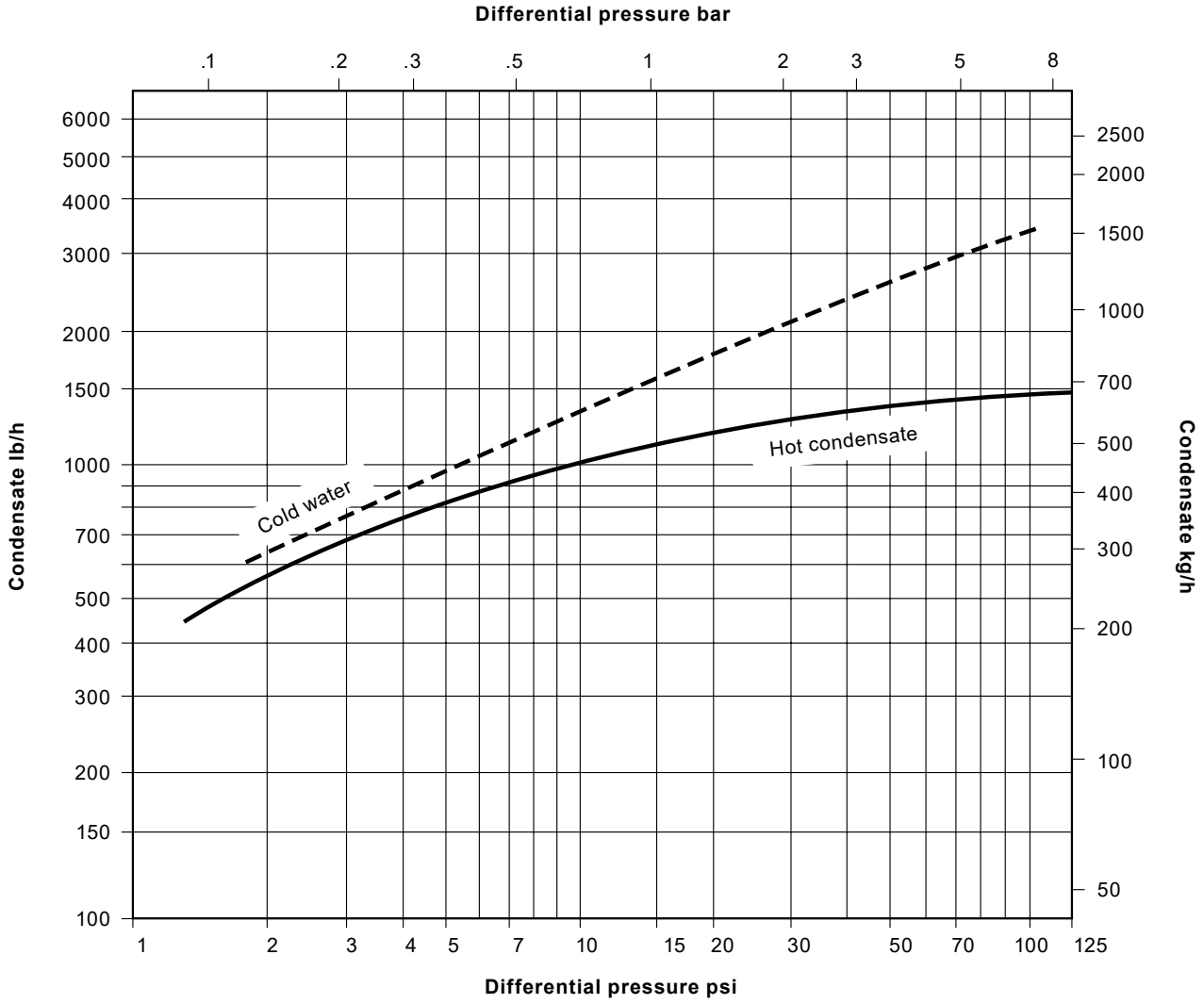


½", ¾", RTV



No.	Part	Material	
1	Body	Forged Red Brass	ASTM B124 Alloy C3770 TV-125 ASTM B62
2	Cap	Forged Red Brass	ASTM B124 Alloy C3770
3	Seat	Stainless Steel	
4	Thermostat	Stainless Steel BP99	
5	Spring	Stainless Steel	
6	Seat Gasket	Brass	
7	O-Ring	EPDM	
8	Union Nipple	Brass	ASTM B16
9	Union Nut	Brass	ASTM B16

Capacities

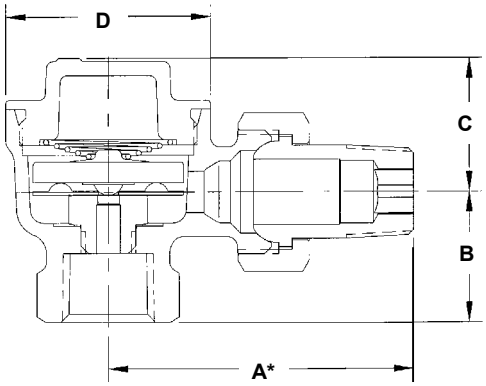


Orifice Size = .196"

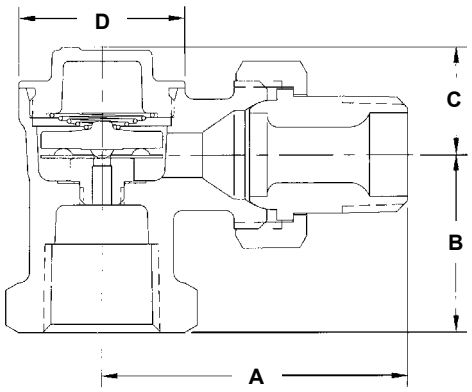
Water Capacity

Hot Condensate

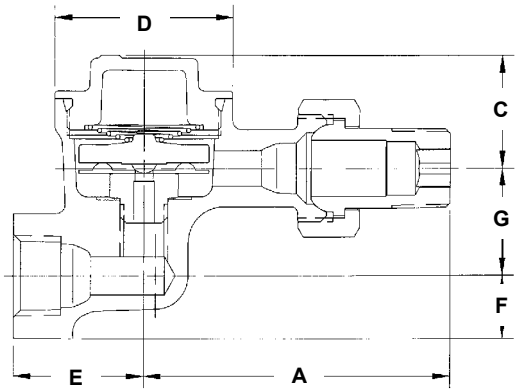
Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)



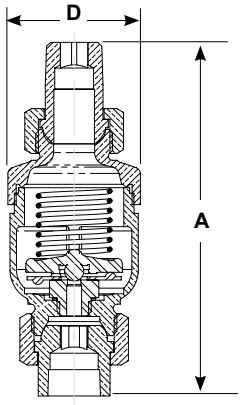
½", ¾" RTA-125



1" RTA-125



½", ¾" RTH-125



½", ¾" RTV-125

Size	Type	Body pattern	A	B	C	D	E	F	G	Weight
½"	RTA-125	Angle	2.8*	1.2	1.0	1.9	–	–	–	1 lb
			(71)	(30)	(25)	(48)	–	–	–	(0.5 kg)
	RTH-125	Straightway	3.2	–	1.2	1.9	1.4	0.7	1.1	1.4 lb
			(81)	–	(30)	(48)	(36)	(18)	(28)	(0.6 kg)
	RTV-125	Vertical	5.1	–	–	2.0	–	–	–	1.6 lb
			(130)	–	–	(51)	–	–	–	(7 kg)
¾"	RTA-125	Angle	3.0*	1.2	1.0	1.9	–	–	–	1.3 lb
			(76)	(30)	(25)	(48)	–	–	–	(0.6 kg)
	RTH-125	Straightway	3.2	–	1.20	1.9	1.4	0.8	1.1	1.8 lb
			(83)	–	(30)	(48)	(36)	(20)	(28)	(0.8 kg)
	RTV-125	Vertical	5.6	–	–	2.0	–	–	–	2 lb
			(142)	–	–	(51)	–	–	–	(0.9 kg)
1"	RTA-125	Angle	3.5	2.0	1.2	1.9	–	–	–	2.8 lb
			(89)	(51)	(30)	(48)	–	–	–	(1.3 kg)

* with optional extended inlet spud, "A" dimension is 3.2".

Sample specification RTA, RTH

Steam traps shall be balanced pressure thermostatic type, self-adjusting to all pressures within their operating range. Bodies to be of forged red brass with male union inlet connection.Thermostatic element shall be of precision welded stainless steel construction, incorporating a hardened stainless steel valve head. Valve seats shall be stainless steel, and all internals, shall be replaceable without disturbing the piping connections.

Installation

A pipeline strainer should be installed ahead of any steam trap to protect the head and seat from dirt and scale. Full port isolating valves should be placed to permit servicing. Trap should be installed below the drainage point of the equipment with a collecting leg before the trap. For best operation, the element should be in a horizontal position as shown. For a freeze-resistant installation, inlet piping must be pitched toward the trap for gravity flow and the trap outlet must be free of any piping.

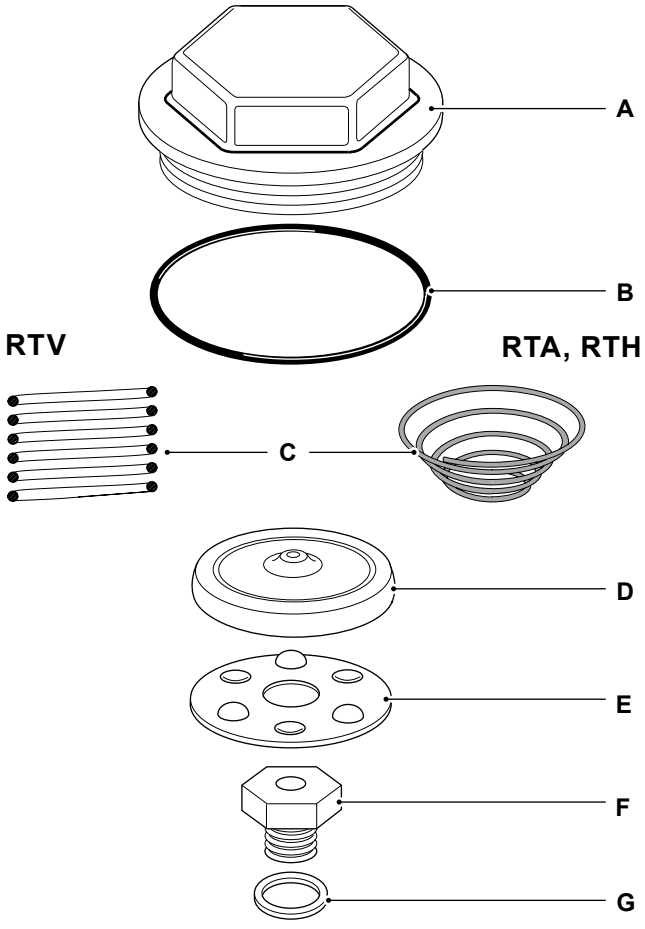
Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation of the trap from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat.
Worn or damaged parts should be replaced using a complete Repair Kit.

Complete installation and maintenance instructions are given in IM-2-004-US, which accompanies the product.

Spare parts

Repair Kit (RTA, RTH)	**B, C, D, E, F, G**
Cap Assembly (RTA, RTH)	**A, B**
Repair Kit (RTV)	**C, D, E, F,G**



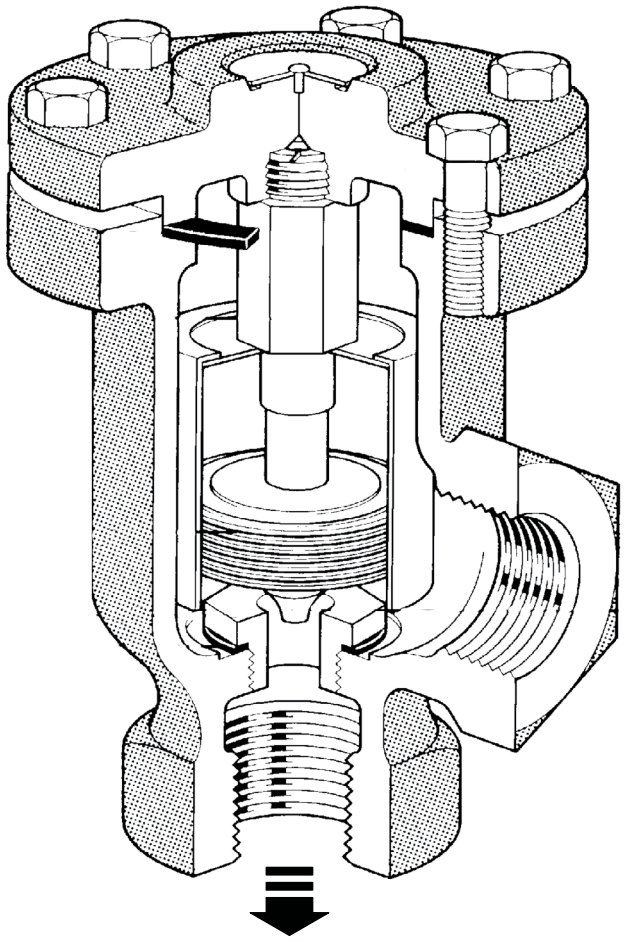
TI-P063-02-US
Issue 1

Balanced Pressure Thermostatic Steam Trap T250

Description

The T250 has a welded stainless steel element, which is self-adjusting over the entire operating pressure range and will discharge condensate at approximately 20 °F (11 °C) below saturated steam temperature.

	T250	
Model	Angle	Straightway
PMO	250 psi g	
Sizes	½", ¾" and 1"	½" and ¾"
Connections	NPT	
Construction	Cast Iron Body and Cover Stainless Steel Internals	



Limiting operating conditions

PMO	Maximum operating pressure	250 psi g (17 bar g)
Maximum operating temperature		Saturated steam temperature

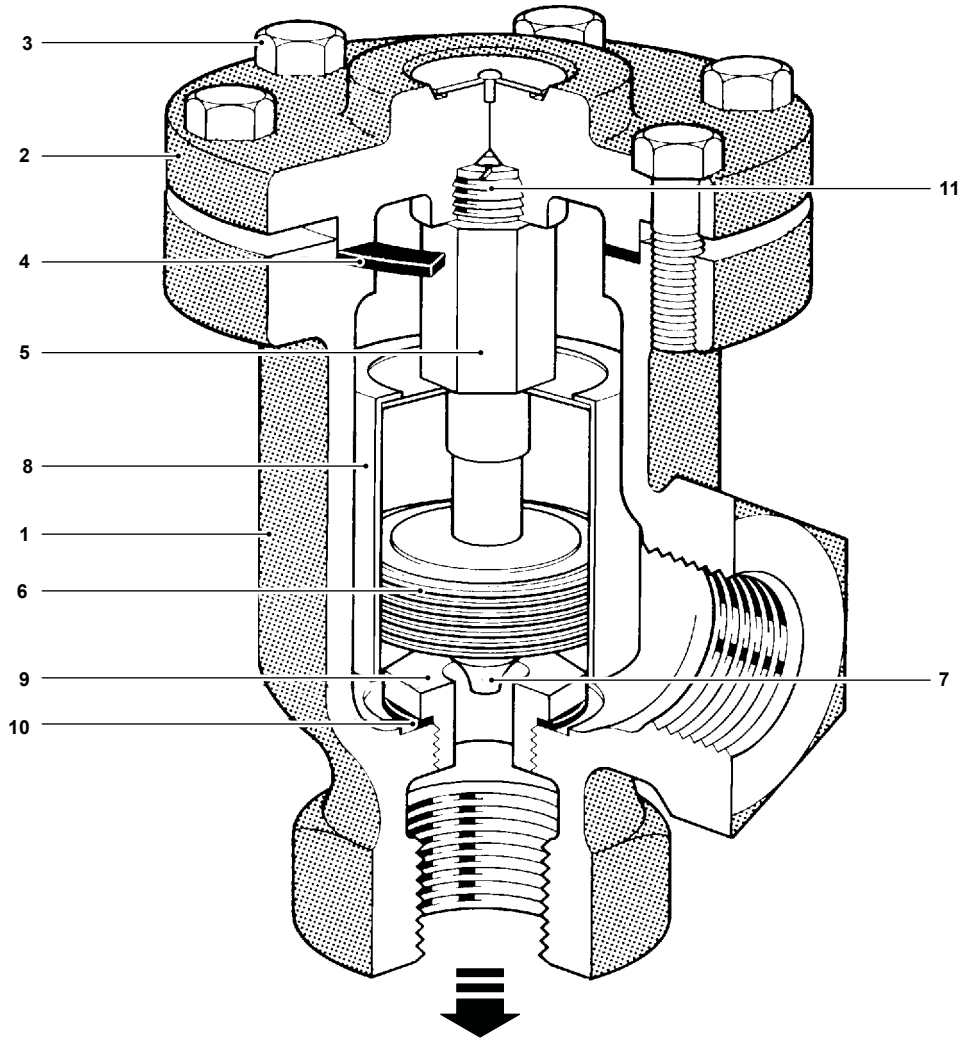
Pressure shell design conditions

PMA	Maximum allowable pressure	250 psi g/up to 450 °F (17 bar g/up to 232 °C)
TMA	Maximum allowable temperature	450 °F/0-250 psi g (232 °C/0-17 bar g)

Typical applications

Hospital, laundry and kitchen equipment, high capacity process equipment, outdoor applications subject to freezing, applications requiring high air venting capacity on initial start up.

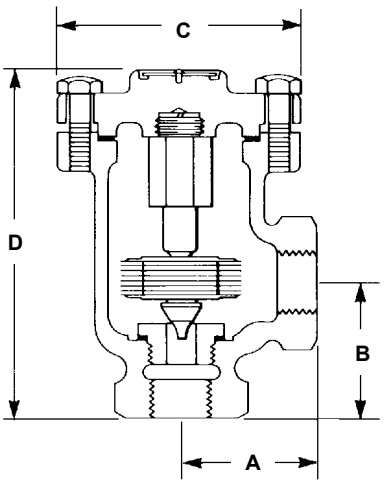
Materials



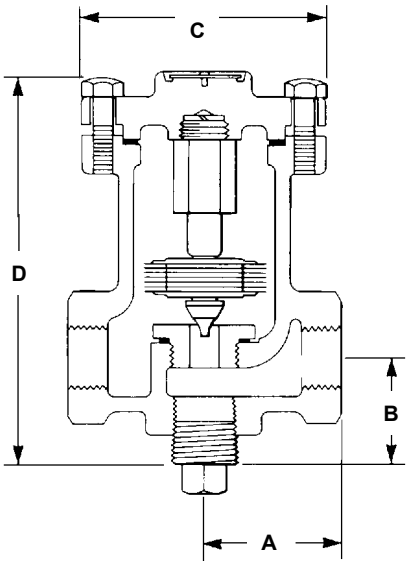
No.	Part	Material	
1	Body	Cast Iron	ASTM A126 CL B
2	Cap	Cast Iron	ASTM A126 CL B
3	Cap Screws	Steel	ASTM A449
4	Cap Gasket	Stainless Steel Clad Non-Asbestos Fill	
5	Element Assembly	Stainless Steel	
6	Bellows	Stainless Steel	
7	Valve Head	Stainless Steel	
8	Bellows Shield (1" only)	Stainless Steel	
9	Valve Seat	Stainless Steel	
10	Valve Seat Gasket	Stainless Steel Clad Non-Asbestos Fill	
11	Lockwasher	Stainless Steel	
12	Plug (Stwy. only)	Forged Steel	

Dimensions/weights
(approximate) in inches (mm) and lbs (kg)

Angle



Straightway



	Size	A	B	C	D	Weight
Angle	½"	1.75	1.75	3.12	4.56	3.5 lb
		(44)	(44)	(79)	(116)	(1.6 kg)
	¾"	1.75	1.75	3.12	4.56	3.5 lb
		(44)	(44)	(79)	(116)	(1.6 kg)
	1"	2.12	2.25	3.9	5.37	6.0 lb
		(54)	(57)	(99)	(136)	(2.7 kg)
Straightway	½"	1.75	1.75	3.12	5.37	4.3 lb
		(44)	(44)	(79)	(136)	(1.9 kg)
	¾"	1.87	1.75	3.12	5.37	4.3 lb
		(47)	(44)	(79)	(136)	(1.9 kg)

Capacities Hot Condensate lb/h

Inlet Pressure				
psi g	bar g	½"	¾"	1"
1	.07	620	850	1300
2	.14	820	1200	1750
5	.34	1200	1650	2600
10	.70	1580	2225	3500
15	1.0	1800	2650	4200
20	1.4	2100	2950	4600
30	2.1	2450	3500	5500
40	2.8	2750	4000	6200
50	3.4	3100	4400	6850
60	4.1	3300	4700	7250
75	5.2	3650	5050	8000
100	6.9	4200	5750	9000
125	8.6	4400	6150	9650
150	10.3	5000	7000	11000
175	12.1	5275	7450	11750
200	13.8	5600	7800	12100
225	15.4	5900	8200	12500
250	17.2	6000	8500	13500
Orifice Size =		.375"	.438"	.500"

Discharge Capacities shown were obtained from tests using hot condensate approximately 20 °F (11 °C) below Saturated Steam temperature.

When condensate temperature is below 200 °F (93 °C), discharge capacity is from two to three times greater than shown above.

Sample specification

Steam traps shall be balanced pressure thermostatic types, self-adjusting to all pressures within their operating range. Bodies to be of heavy cast iron with NPT connections. Thermostatic elements shall be of precision welded stainless steel construction. All internals to be stainless steel and shall be replaceable without disturbing the piping connections.

Installation

A pipeline strainer should be installed ahead of any steam trap to protect the valve and seat from dirt and scale. Full port isolating valves should be placed to permit servicing. The trap should be installed below the drainage point of the equipment with a collecting leg before the trap. For best operation, the bellows should be in a horizontal position as shown. For a freeze-resistant installation, inlet piping must be pitched toward the trap for gravity flow, and the trap outlet must be free of any piping. See installation instructions #250-D8.

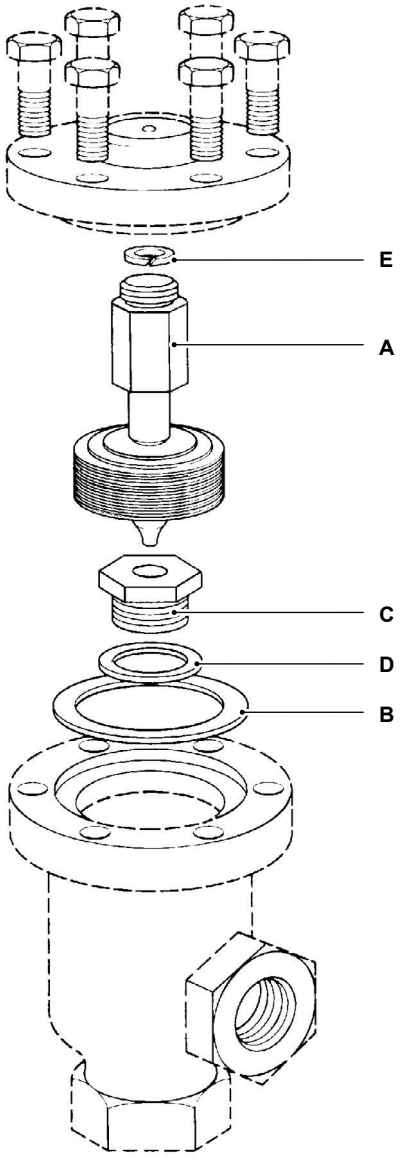
Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat.
Worn or damaged parts should be replaced using a complete element set.
Complete installation and maintenance instructions are given in IMI 2.004, which accompanies the product.

Spare parts

Available spare parts are shown in heavy outline. Angle and straightway traps accept the same spare parts.

Element Set	**A, B, C, D, E**
Cap Gasket	**B**



TI-P063-03-US
Issue 1

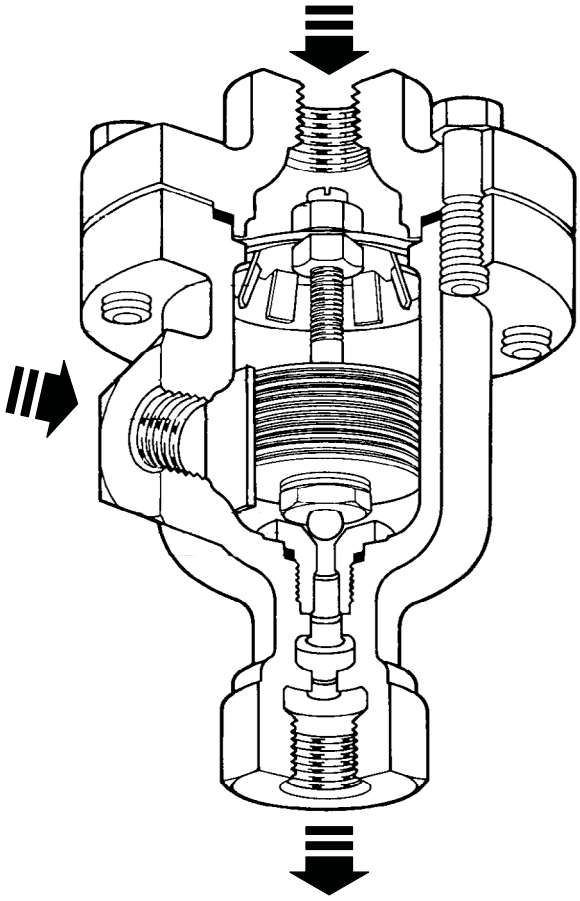
Balanced Pressure Thermo-Matic® Steam Trap TM600, TM600L, TM600N

Description

The trap contains a calibrated element module which is self-adjusting so that condensate is discharged within 10 °F of saturated steam temperature over the full operating pressure range. The solid fill bellows can withstand pressure surges and waterhammer, and a patented heat sink protects the bellows from over-expansion should the steam pressure suddenly be reduced. The integral downstream flash chamber reduces discharge velocity to provide smooth discharge of high condensate loads.

Model	TM600	TM600L	TM600N
PMO	600 psi g		
Sizes	½" and ¾"		
Connections	NPT		
Construction	Ductile iron body stainless steel internals		Carbon Steel body stainless steel internals
Options	BSP Connections		
			SW or flanged to MIL-T-960, Type II

TM600L*



* TM600 has a cone valve head.

Typical applications

High-pressure steam main drips, high-pressure process equipment, outdoor installations subject to freezing.

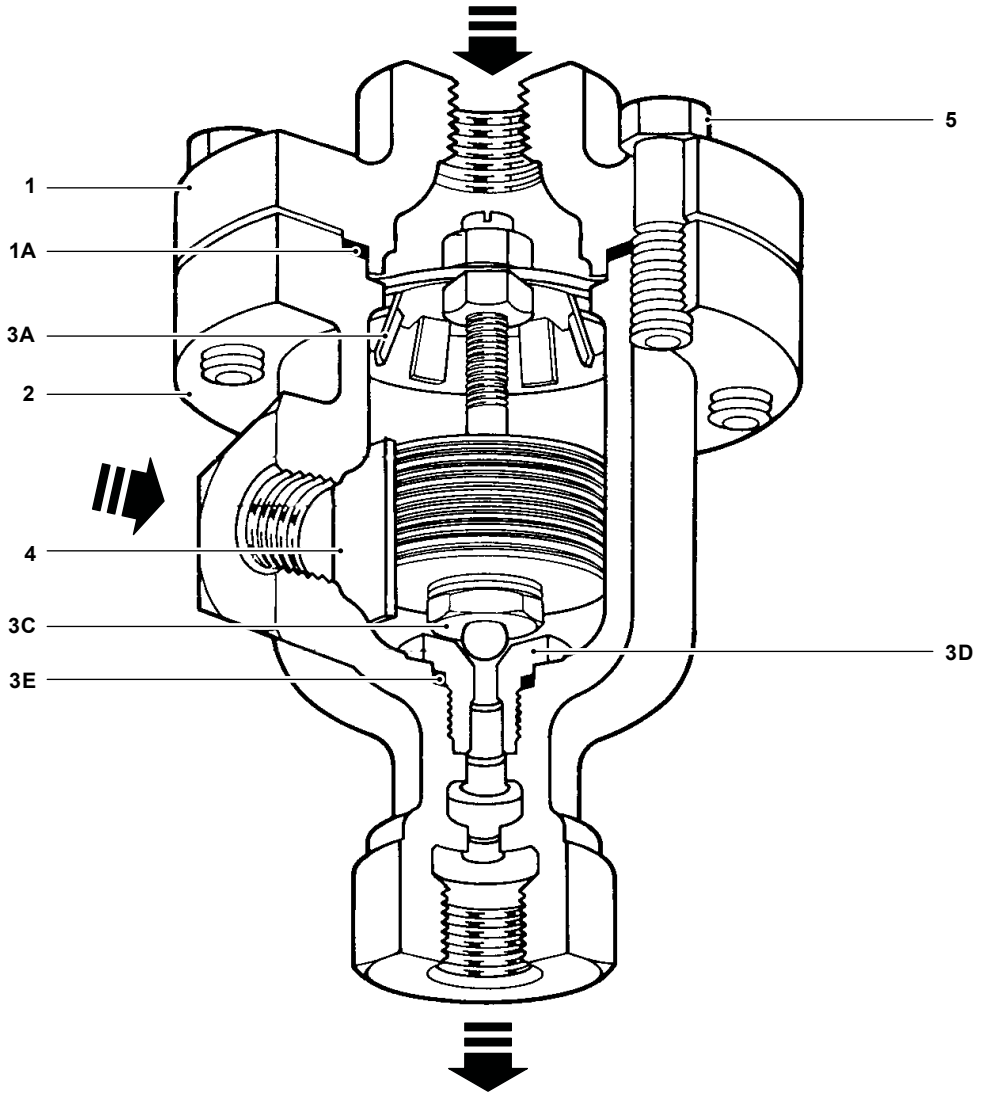
Limiting operating conditions

PMO	Maximum Operating Pressure	600 psi g (41 bar g)
Maximum Operating Temperature		Saturated Steam Temperature

Pressure shell design conditions

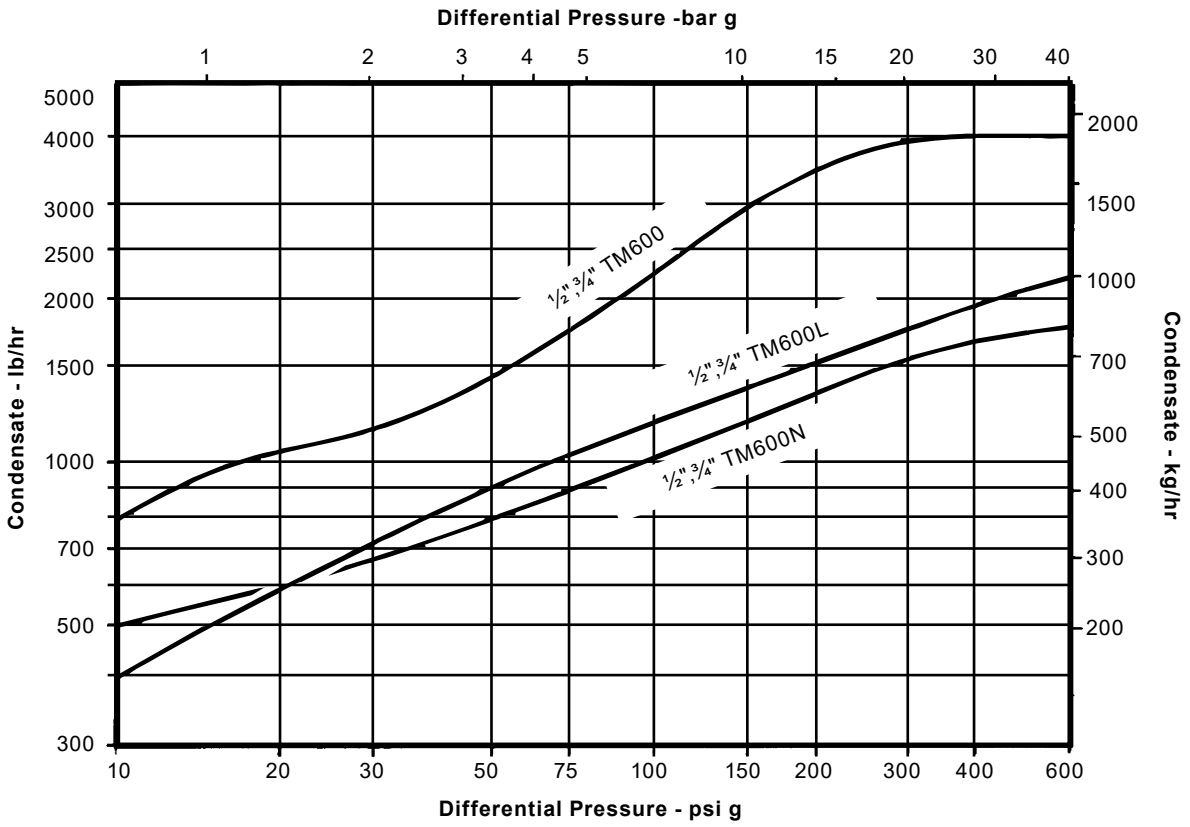
PMA	Maximum allowable pressure	600 psi g/up to 650 °F (41 bar g/up to 343 °C)
TMA	Maximum allowable temperature	650 °F/0-600 psi g (343 °C/0-41 bar g)

Materials



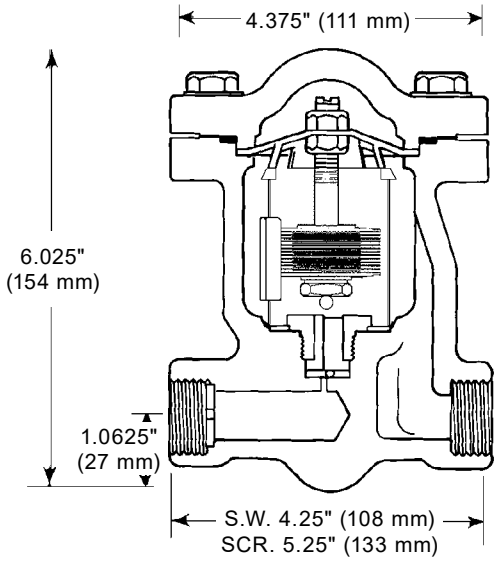
No.	Part	Material	
1	Cover TM600	Ductile Iron	ASTM A395
		TM600N	ASTM A216 G2 WCB
1A	Cover Gasket	Spiral Wound	AISI 304 strip
		Stainless Steel, Graphite Filled	
2	Body TM600	Ductile Iron	ASTM A395
		TM600N	ASTM A216 G2 WCB
3A	Support Plate	Stainless Steel	AISI 304
3C	Valve Head	Hardened Stainless Steel	
		TM 600 (Cone Head)	AISI 420F
		TM 600L (Ball Head)	AISI 440
3D	Valve Seat	Hardened Stainless Steel	AISI 420F
3E	Valve Seat Gasket	Spiral Wound	AISI 304 strip
		Stainless Steel, Graphite Filled	
4	Baffle	Stainless Steel	AISI 302
5	Cover Screws	Steel	ASTM A 449, Type 1

Capacities



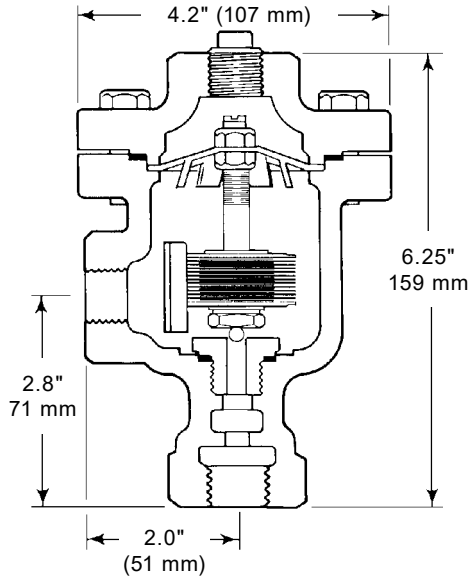
Dimensions/weights (approximate) in inches (mm) and lbs (kg)

TM600N



Weight
91/4 lbs (4.2kg)

TM600
TM600L



Weight
7.0 lb (3.2 kg)

Sample specification

Steam trap shall be Spirax Sarco type TM600 Thermo-Matic®, self-adjusting for operating pressures to 600 psi g (41 bar g). The traps shall incorporate a flash chamber to reduce discharge velocity. Thermostatic elements shall be factory calibrated and shall have a heat sink to prevent over-expansion. Traps shall be non-freezing, and shall have a choice of top or side inlet (TM600 and TM600L) or traps shall have horizontal in-line connectionss (TM600N). Body and cap shall be ductile iron (TM600 and TM600L) or carbon steel (TM600N).

Installation

A pipeline strainer should be installed ahead of any steam trap to protect the head and seat from dirt and scale. Full-flow isolating valves should be placed to permit servicing. The trap should be installed below the equipment with a collecting leg before the trap. For best operation, the bellows should be in a horizontal position as shown. For a freeze-resistant installation, the inlet piping must be pitched toward the trap for gravity flow, and the trap must discharge to atmosphere or drain.

Maintenance

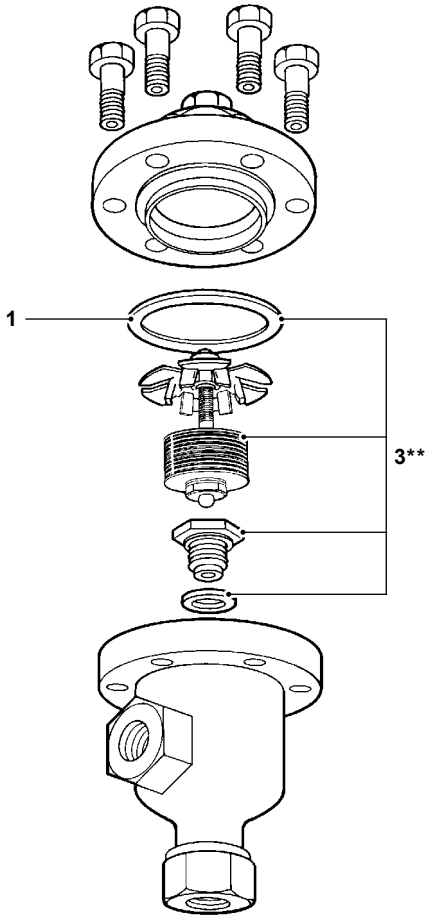
This product can be maintained, unless installed vertically using the alternate inlet, without disturbing the inlet piping connections. Complete isolation of the trap from both supply and return line is required before any servicing is performed.
The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, and cleaning of the strainer screen (TM600N only).
Worn or damaged parts should be replaced using a complete Element Set.
Complete installation and maintenance instructions are given in IMI 2.004, which accompanies the product.

Spare Parts*

Available spare parts are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

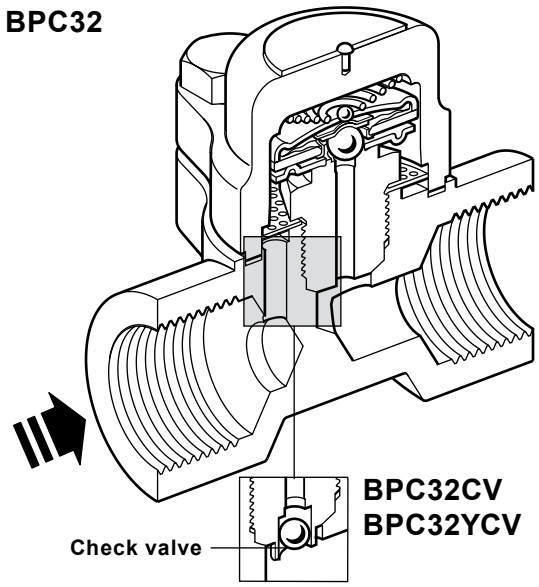
Cover Gasket	**1**
Element Set	**3**

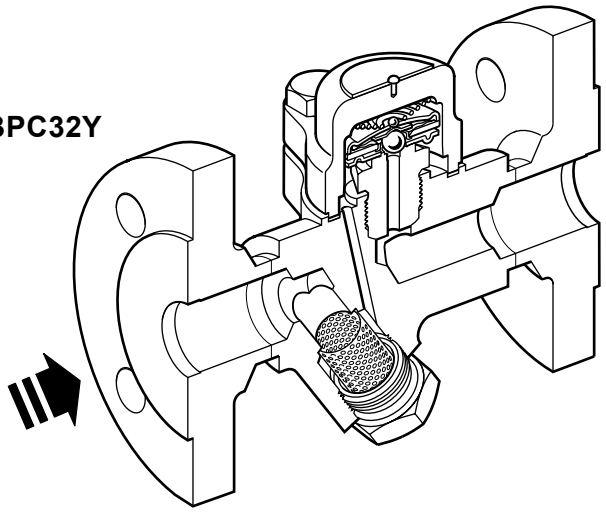
* TM600, TM600L and TM600N parts are not interchangeable. Consult factory for TM600N spare parts.
** TM600 has a cone head



TI-P005-01
CMGT Issue 9

BPC32 and BPC32Y Carbon Steel Balanced Pressure Thermostatic Steam Traps





Description

The BPC32 and BPC32Y are carbon steel maintainable balanced pressure thermostatic steam traps with straight connections.
The BPC32 has an integral flat strainer screen and the BPC32Y an integral cylindrical Y-type strainer. All pressure bearing components are produced by TÜV approved suppliers in accordance with AD-Merkblatt WO/TRD100. Both traps are unaffected by waterhammer and are available as follows:-

Standard units	**BPC32 and BPC32Y**	having 'STD' fill capsule	**Note:** When placing an order always state capsule fill.
Also available	**BPC32CV and BPC32YCV**	having 'STD' fill capsule and check valve	

Capsule fill and operation:

Standard capsule - Is marked with '**STD**' for operation at approximately 12 °C (53.6°F) below steam saturation temperature.

Optionally - The capsule can be supplied for sub-cooled '**SUB**' operation at approximately 24 °C (75.2 °F) below steam saturation temperature or near-to-steam '**NTS**' operation at approximately 6 °C (42.8 °F) below steam temperature.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

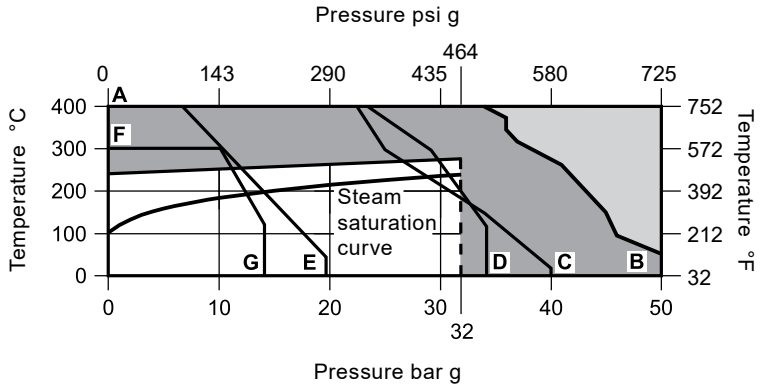
Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

½", ¾", and 1" screwed BSP T Rp (ISO 7-1) or NPT.
½", ¾", and 1" socket weld ends to BS 3799.
½", ¾", and 1" butt weld ends to EN 12 627.
DN15, DN20 and DN25 standard flange to EN 1092 PN40,
ASME B 16.5 Class 150 and 300, JIS/KS 10K and JIS/KS 20K.

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

A - B Screwed, socket weld, butt weld and flanged ANSI 300.

A - C Flanged EN 1092 PN40.

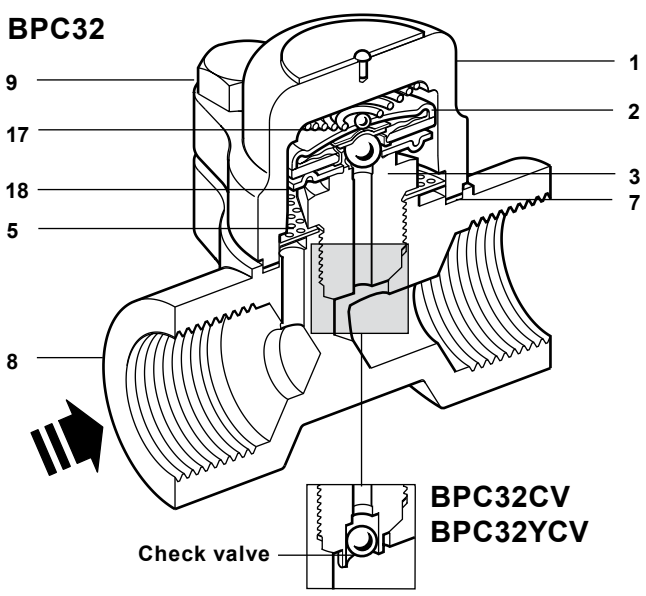
A - D Flanged JIS/KS 20K.

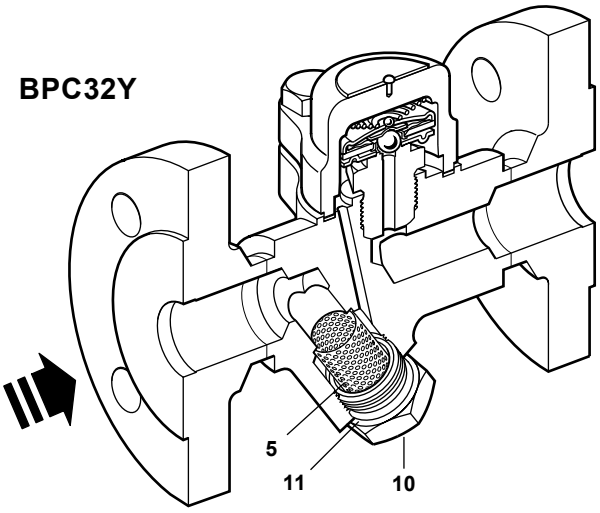
A - E Flanged ANSI 150.

F - G Flanged JIS/KS 10K.

Body design conditions			PN40
PMA	Maximum allowable pressure	50 bar g @ 50 °C	725 psi g @ 122 °F
TMA	Maximum allowable temperature	400 °C @ 35 bar g	752 °F @ 508 psi g
Minimum allowable temperature		-60 °C	-76 °F
PMO	Maximum operating pressure for saturated steam service	32 bar g @ 281 °C	464 psi g @ 537 °F
TMO	Maximum operating temperature	281 °C @ 32 bar g	537 °F @ 464 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco.		0 °C	32 °F
BPC32 and BPC32Y product ranges are verified safe for use under full vacuum conditions for screwed, socket weld, butt weld and flanged connections. **Note**: Please consult Spirax Sarco to confirm full vacuum suitability, for other pipe connections.			
Designed for a maximum cold hydraulic test pressure of:		75 bar g	1088 psi g

Materials

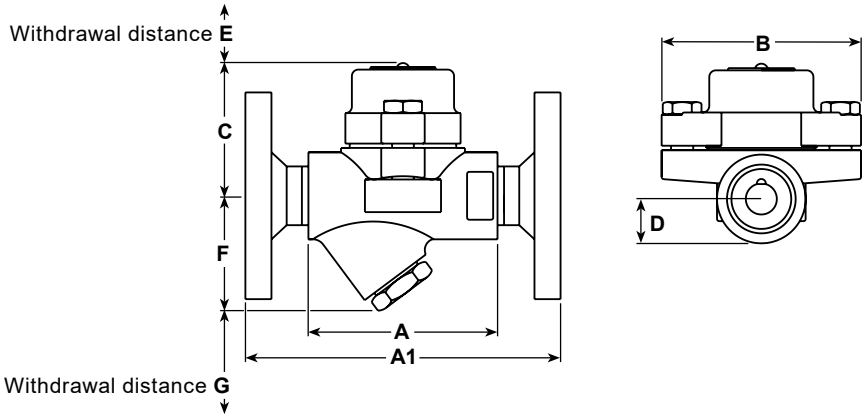




No.	Part	Material	
1	Cover	Carbon steel	DIN 17243 C22.8 (W/S 1.0460) ASTM A105N
2	Capsule	Stainless steel	
3	Valve seat	Stainless steel	BS 970 431 S29
5	Strainer screen	Stainless steel	AISI 304
7	Cover gasket	Stainless steel reinforced exfoliated graphite	
8	Body / flanges	Carbon steel	DIN 17243 C22.8 (W/S 1.0460) ASTM A105N
9	Cover bolts	Stainless steel (M10 x 30)	A2-70
10	Strainer cap	Carbon steel	DIN 17243 C22.8 (W/S 1.0460) ASTM A105N
11	Strainer cap gasket	Stainless steel	BS 1449 304 S16
17	Spring	Stainless steel	
18	Spacer plate	Stainless steel	

Dimensions/weights

(approximate) in mm (inches) and kg (lbs)



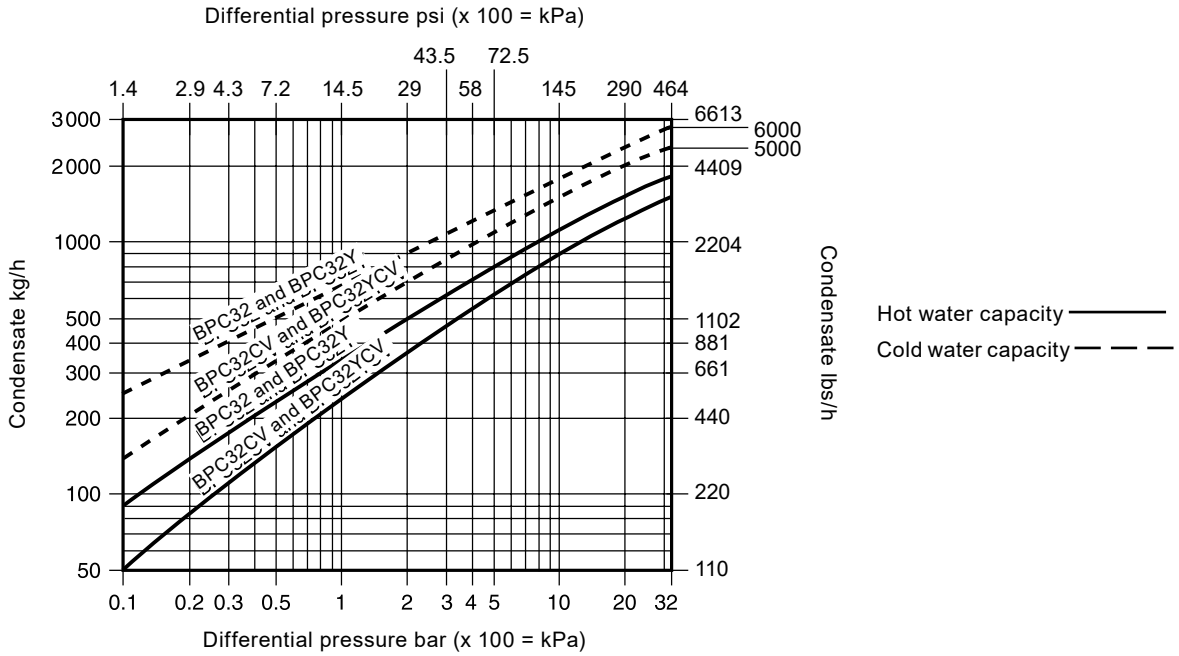
BPC32

Size	A	A1	B	C	D	E	F	G	Weight Scrd/SW/BW	Weight Flanged
½" DN15	95 (3.74)	150 (5.9)	94 (3.70)	64 (2.52)	17 0.67)	37 (1.46)	-	-	1.4 (3.1)	2.9 (6.4)
¾" DN20					19 (0.75)					
1" DN25					23 (0.91)				1.5 (3.3)	4.1 (9.0)

BPC32Y

Size	A	A1	B	C	D	E	F	G	Weight Scrd/SW/BW	Weight Flanged
½" DN15	95 (3.74)	150 (5.9)	94 (3.70)	64 (2.52)	-	37 (1.46)	54 (2.13)	28 (1.10)	1.6 (3.5)	3.1 (6.8)
¾" DN20										3.7 (8.2)
1" DN25									1.8 (4.0)	4.4 (9.7)

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P005-02) supplied with the product.

Installation note:

The BPC32 and BPC32Y are designed for installation in any position, horizontal or vertical.
It is recommended that a non-return valve is fitted when discharging condensate into return lines where backpressure is experienced.
It is also recommended that a diffuser is fitted when discharging to atmosphere.
For ease and maintenance, consideration should be given to fitting isolation valves upstream and downstream of the steam trap.

Disposal

These products are recyclable. No ecological hazard is anticipated with the disposal of these products, providing due care is taken.

How to order

Example: 1 off Spirax Sarco ½" BPC32 carbon steel bodied maintainable balanced pressure thermostatic steam trap. Screwed BSP with 'STD' fill capsule for operation at approximately 12 °C below steam saturation temperature.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

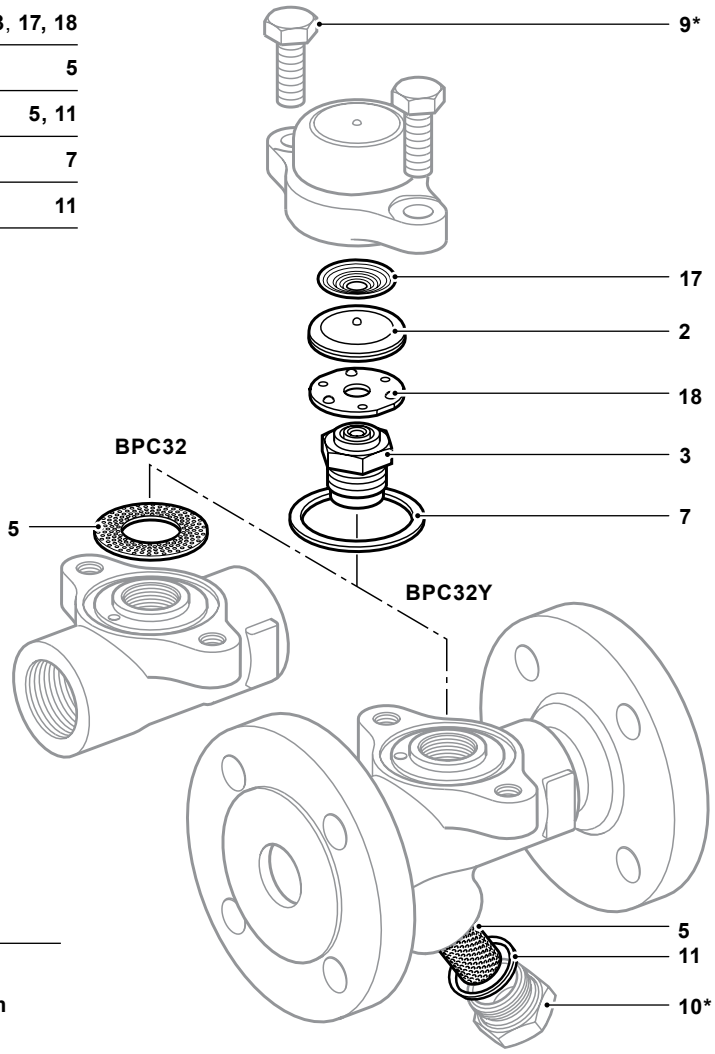
Available spares

Capsule and seat assembly set			**2, 3, 17, 18**
Strainer screen	BPC32	(3 off)	**5**
Strainer screen and gasket	BPC32Y	(1 off each)	**5, 11**
Set of cover gaskets		(packet of 3)	**7**
Strainer cap gasket		(packet of 3)	**11**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, model number and capsule reference.

Example: 1 - Capsule and seat assembly set for a Spirax Sarco DN25 BPC32 - 'STD' fill capsule for operation at 12 °C below steam saturation temperature.



*** Note:** Items 9 and 10 are not available as spares

Recommended tightening torques

Item	Part	or mm		N m
3	Valve seat	24 A/F		115 - 125
9	Cover bolts	16 A/F	M10 x 30	23 - 27
10	Strainer cap	27 A/F		120 - 135

TI-P125-08
CMGT Issue 11

MST21
Stainless Steel
Balanced Pressure Thermostatic Steam Trap

Description
The MST21 is a maintainable balanced pressure thermostatic steam trap designed for relatively small condensate loads usually associated with instrument tracing applications. It is manufactured in stainless steel and is corrosion resistant and easily maintainable.

Available types

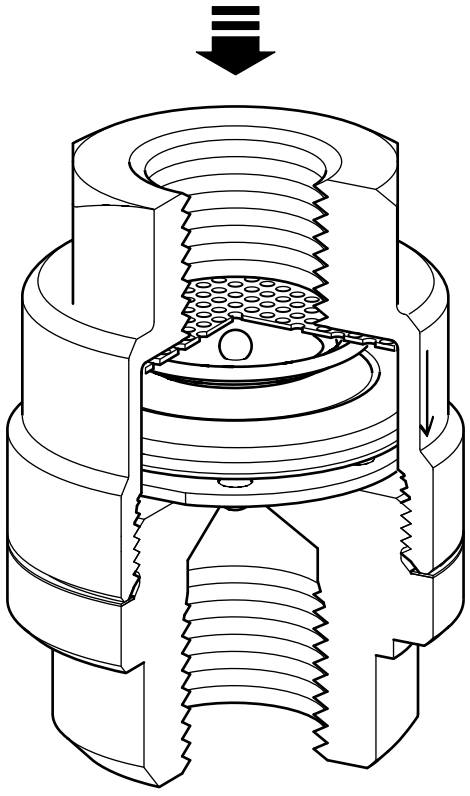
MST21	Standard capacity for tracing loads (standard unit)
MST21H	High capacity for special applications

Note: When placing an order always state the capsule fill.

Capsule fill and operation
Standard capsules are marked with the letter 'STD' for operation at approximately 10 °C (18 °F)) below steam saturation temperature. **Optionally** the capsule can be supplied for sub cooled 'SUB' operation at approximately 22 °C (40 °F) below steam saturation temperature or a 'NTS' fill capsule for operation at approximately 4 °C (8 °F) below steam saturation temperature.

Standards
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

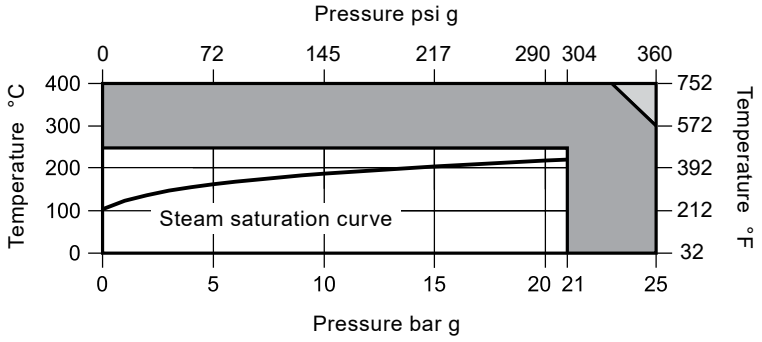
Certification
This product is available with a manufacturers' Typical Test Report.
Note: All certification/inspection requirements must be stated at the time of order placement.



Sizes and pipe connections

MST21	¼" ⅜" and ½"	screwed BSP T Rp (ISO 7-1), EN ISO 228-1, or NPT.
MST21H	½", ¾" and 1"	screwed BSP T Rp (ISO 7-1), EN ISO 228-1, or NPT.

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

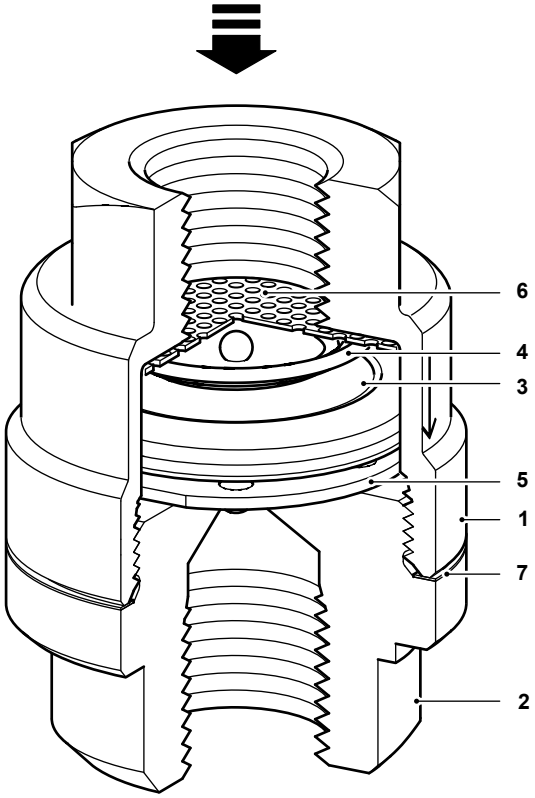
The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Body design conditions			PN25
PMA	Maximum allowable pressure	25 bar g @ 300 °C	363 psi g @ 572 °F
TMA	Maximum allowable temperature	400 °C @ 23 bar g	752 °F @ 334 psi g
Minimum allowable temperature		0 °C	32 °F
PMO	Maximum operating pressure	21 bar g @ 235 °C	305 psi g @ 455 °F
TMO	Maximum operating temperature	235 °C @ 21 bar g	455 °F @ 305 psi g
Minimum operating temperature		0 °C	32 °F
Designed for a maximum cold hydraulic test pressure of		38 bar g	551 psi g

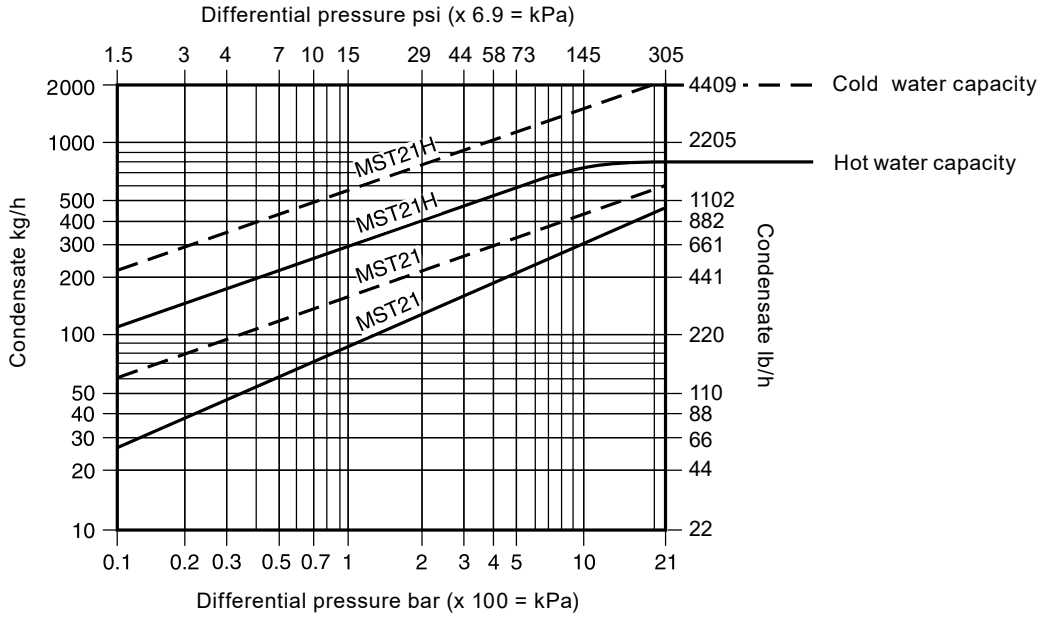
Materials

No.	Part	Material	
1	Body	Austenitic stainless steel (303)	ASTM A743 CF16Fa
2	Cap	Stainless steel	420A UGIMA AISI 420
3	Capsule	Stainless steel	
4	Spring	Stainless steel	BS 2056 302 S26
5	Spacer plate	Stainless steel	BS 1449 304 S15
6	Strainer screen (0.8mm perforations)	Stainless steel	ASTM A240 316L
7	Gasket	Stainless steel	BS 1449 304 S15

Note: Material grades shown in brackets are nearest equivalents.

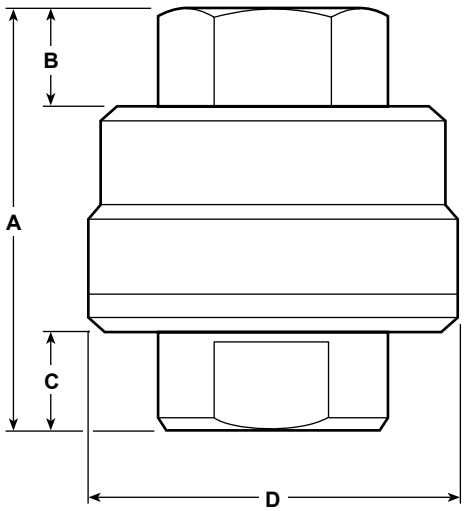


Capacities



Dimensions/weights (approximate) in mm (inches) and kg (lbs)

Size	A	B	C	D	Weight
¼"	50.5 (1.99)	8.5 (0.33)	10 0.39)	45 (1.77)	0.34 (0.75)
½"	61.0 (2.40)	12.5 (12.5)	14 (0.55)		0.48 (1.06)
⅜"	68.0 (2.68)	14.0 (0.55)			
¾"					
1"	75.0 (2.95)				



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P125-07) supplied with the product.

Installation note

The MST21 is designed for installation with the capsule in a vertical line with the inlet at the top and the outlet at the bottom. This will ensure it is self-draining. If fitted in a horizontal line the trap should be proceded by a short drop-leg.

Caution

The body/cover gasket contains a thin stainless steel support ring, which may cause physical injury if it is not handled and disposed of carefully.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

How to order

Example: 1 off Spirax Sarco ¼" MST21 balanced pressure thermostatic steam trap having a 'STD' fill capsule for operation approximately at 10 °C (18 °F) below steam saturation temperature. The connections are to be screwed NPT.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

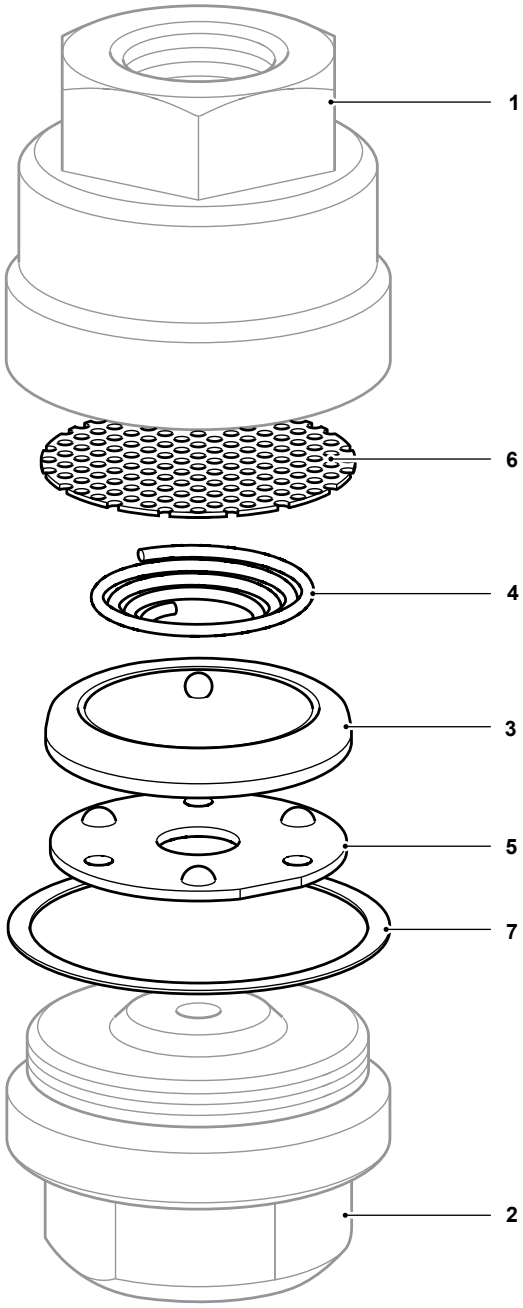
Available spares

Internals set for MST21	**3, 4, 5, 6, 7**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, model number and capsule reference.

Example: 1 off Internals set for a Spirax Sarco ¼" MST21 balanced pressure thermostatic steam trap having a 'STD' fill capsule for operation at 10 °C below steam saturation temperature.



Recommended tightening torques

Item	Part	or mm	N m
1 and 2	¼"	22	100 - 110
	½"	32	100 - 110
	⅜"	32	100 - 110
	¾"	36	100 - 110
	1"	41	100 - 110

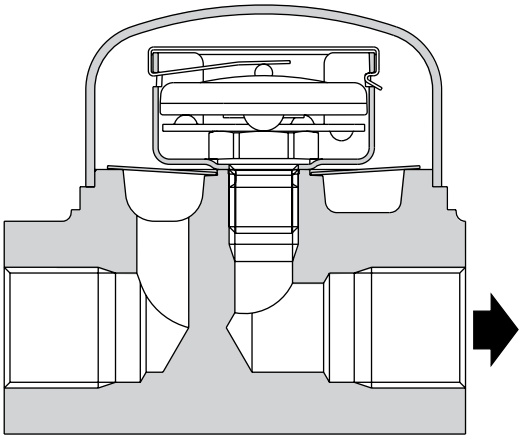
TI-P120-01
CMGT Issue 8

SBP30
Stainless Steel Sealed Balanced Pressure Thermostatic Steam Trap

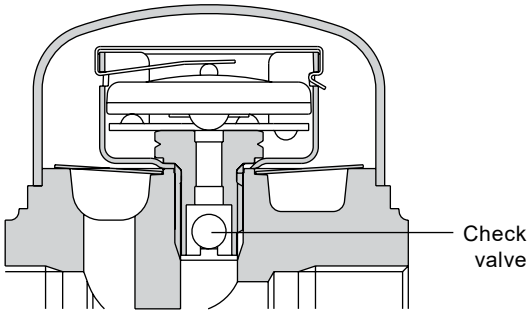
Description
The SBP30 is a sealed balanced pressure stainless steel steam trap with straight connections. It is unaffected by waterhammer and is available as follows:-

Standard unit	**SBP30**	Low capacity without check valve with 'STD' fill capsule
Also available	**SBP30LCV**	Low capacity with check valve
	SBP30H	High capacity without check valve
	SBP30HCV	High capacity with check valve

Note: When placing an order always state capsule fill.



SBP30



SBP30LCV
SBP30HCV

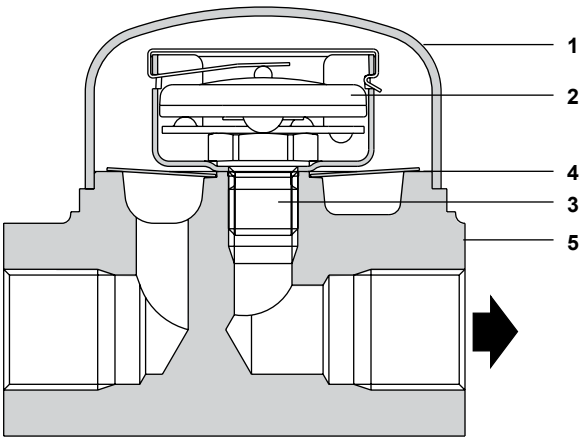
Capsule fill and operation:
Standard capsule is marked with '**STD**' for operation at approximately 12 °C (53.6 °F) below steam saturation temperature.
Optionally - the trap can be supplied for sub-cooled '**SUB**' operation at approximately 24 °C (75.2 °F) below steam saturation temperature.

Standards
This product fully complies with the requirements of the Pressure Equipment Directive (PED).
The cover (and flanges when specified) is welded to the body using the TIG process. Welds are approved in accordance with ASME Section IX and BS EN 288.

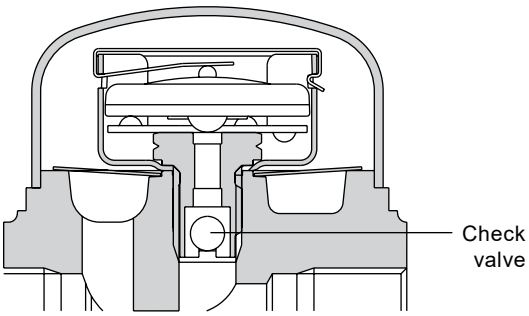
Certification
The product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections
½" and ¾" screwed BSP or NPT.
½" and ¾" socket weld ends to BS 3799/ASME (ANSI) B 16.11 Schedule 80.
DN15 and DN20 standard flange ASME (ANSI) B 16.5 Class 150 and ASME (ANSI) 300, EN 1092, PN25 and PN16.

Materials



SBP30



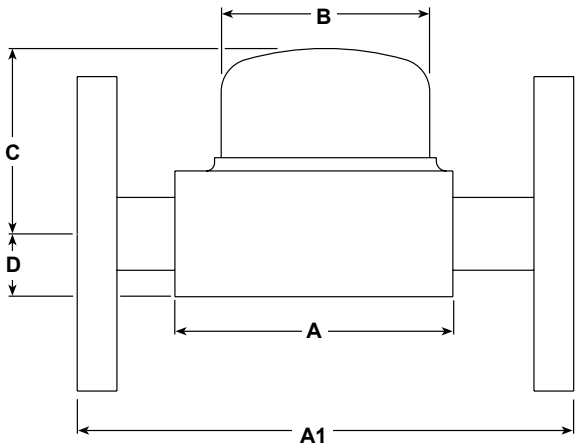
SBP30LCV
SBP30HCV

No	Part	Material	
1	Cover	Stainless steel	ASTM A240 Gr. 304
2	Capsule	Stainless steel	
3	Valve seat	Stainless steel	AISI 431
4	Strainer screen	Stainless steel	AISI 304
5	Body	Stainless steel	A182 F304
	Flanges PN40	Carbon steel	DIN 17100 ST 37/2
	Flanges ANSI	Carbon steel	ASTM A105N
	Stub ends	Schedule 40 pipe to	ASTM A106 Grade B

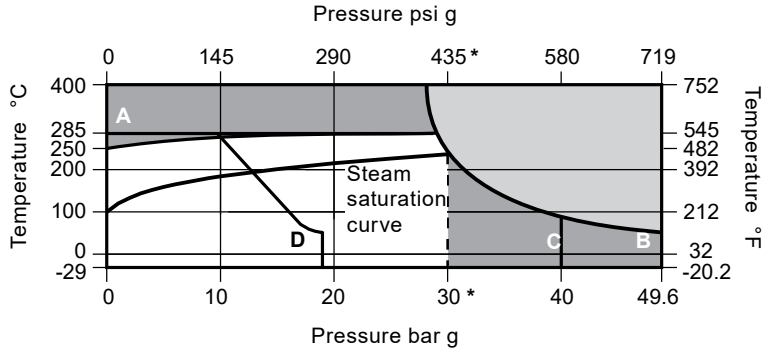
Note: Carbon steel flanges are supplied as standard. Stainless steel flanges can be supplied as an option.

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

Size	A	A1	B	C	D	Weight Scr/ SW	Weight Flg
½" - DN15	80 (3.15)	150 (5.91)	63 (2.48)	56 (2.20)	19 (0.75)	1.0 (2.20)	2.4 (5.3)
¾" - DN20							



Pressure/temperature limits



The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

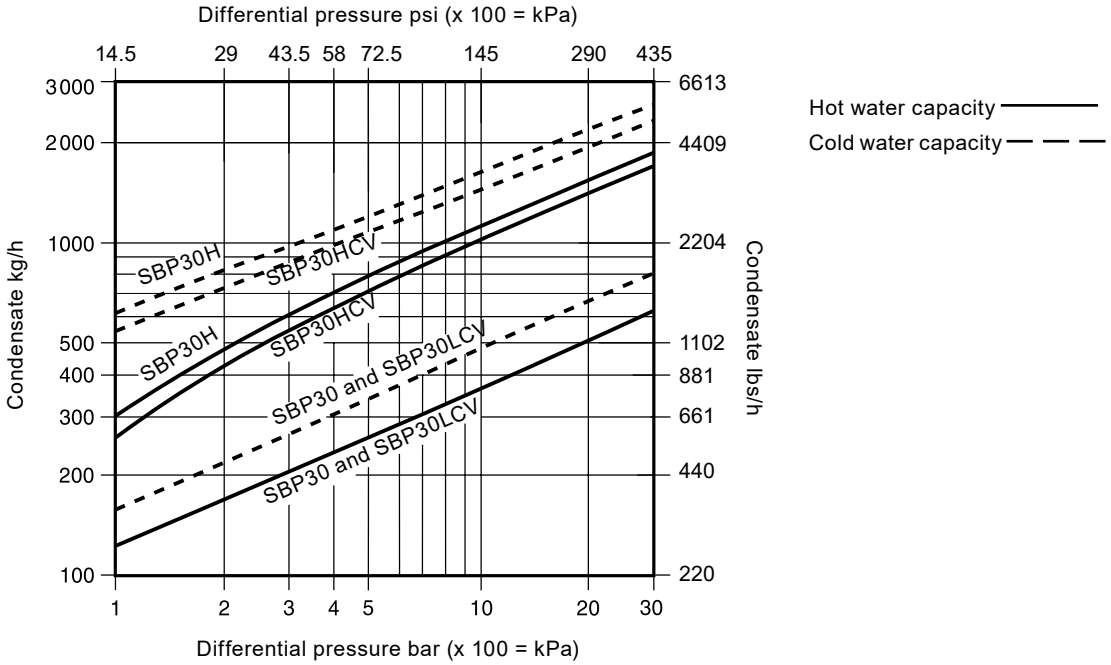
A - B Screwed, socket weld and flanged Class 300.

A - C Flanged EN 1092 PN40.

A - D Flanged ASME (ANSI) 150.

Body design conditions			Class 300
PMA	Maximum allowable pressure	49.6 bar g @ 50 °C	719 psi g @ 122 °F
TMA	Maximum allowable temperature	400 °C @ 27.8 bar g	752 °F @ 403 psi g
Minimum allowable temperature		-29 °C	-20.2 °F
PMO	Maximum operating pressure	30 bar g @ 235 °C	435 psi g @ 455 °F
TMO	Maximum operating temperature	285 °C @ 30 bar g	545 °F @ 435 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco		0 °C	32 °F
Designed for a maximum cold hydraulic test pressure of		75 bar g	1088 psi g

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P120-04) supplied with the product.

Installation note:

The trap is designed for installation with the capsule in a horizontal plane and the cover at the top, preferably with a drop leg immediately preceding the trap. Suitable isolation valves must be installed to allow for safe maintenance and trap replacement.

Maintenance note:

It is important to renew the complete assembly as there are no servicable parts.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

How to order

Example: 1 off ½" screwed BSP Spirax Sarco SBP30 stainless steel sealed balanced pressure thermostatic steam trap. The trap is to be supplied with an 'STD' fill capsule fitted for operation at approximately 12 °C below steam saturation temperature.

TI-P041-01-US
Issue 2

Cast iron Inverted Bucket Steam Traps B Series

Description

The trap contains an inverted bucket mechanism which responds to the difference in density between steam and condensate. The discharge action is cyclic. Condensate is discharged close to steam temperature.

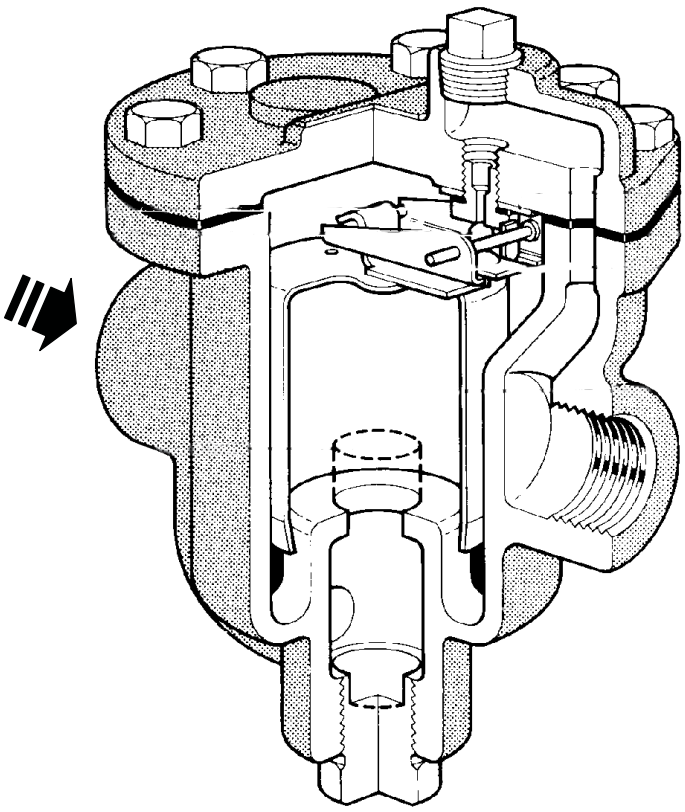
Model	B1H	B2	B3	B4	B5
PMO	250 psi g (see below)				
Sizes	½", ¾"	¾"	1"	1¼"	2"
Connections	NPT				
Construction	Cast iron Body, Stainless steel Mechanism				
	Stainless steel Bucket				
Options	Bimetal air vent (add '2' to model No. eg. B12HS, B22S, etc.) Integral strainer (add 'S' to model No. eg. B1HS, B2S, etc.) **(when bimetal is required, strainer becomes standard)**				

Typical applications

Steam main drip stations, laundry equipment, industrial dryers and storage tanks.

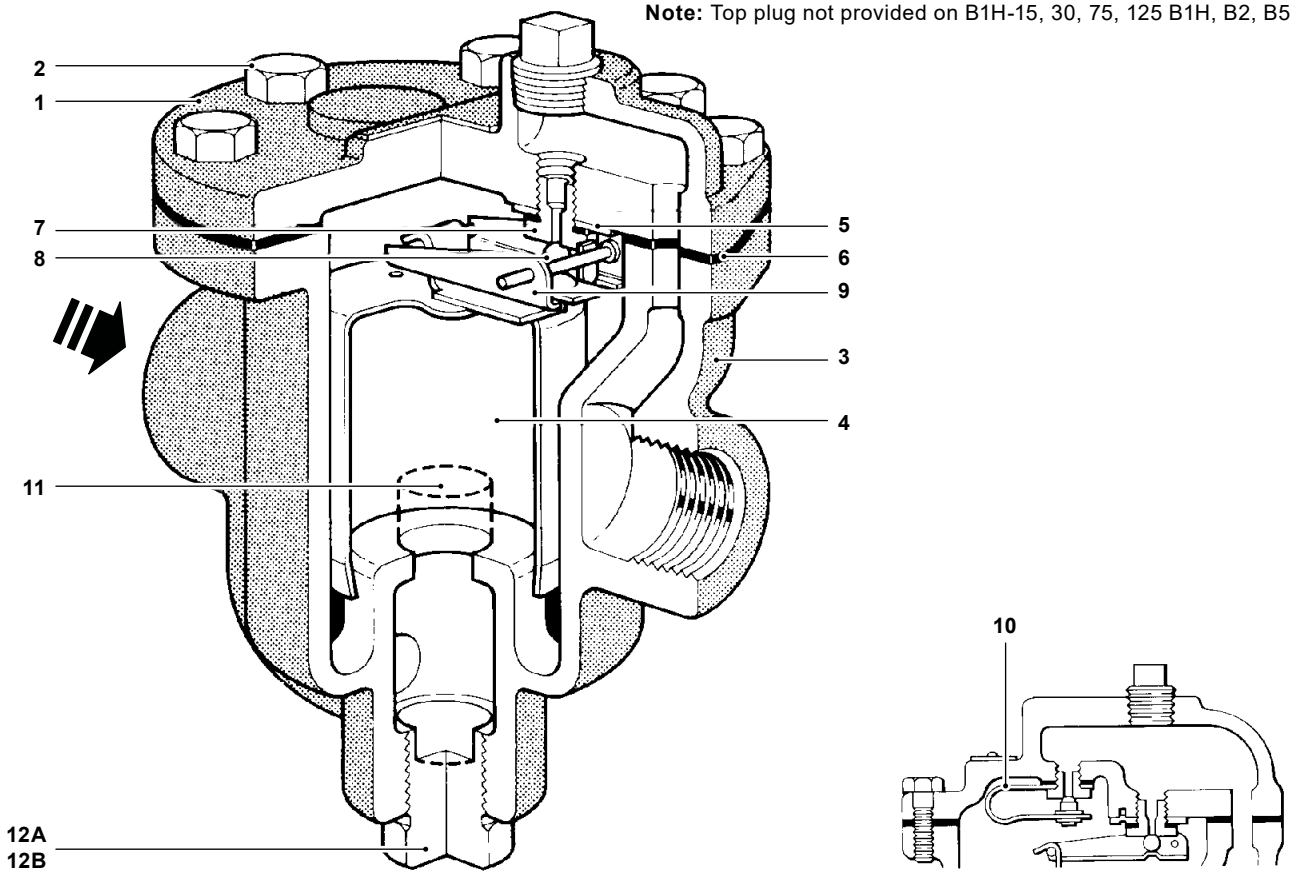
Optional bimetal air vent

The optional bimetal air vent allows rapid air removal on cold start-up. The vent closes at approximately 200 °F (392 °C), and will remain closed during normal operation of the trap.



Materials

Note: Top plug not provided on B1H-15, 30, 75, 125 B1H, B2, B5



No.	Part	Material	
1	Cover	Cast iron	ASTM A126 CL B
2	Cover Screws	Steel	ASTM A 449
3	Body	Cast iron	ASTM A126 CL B
4	Bucket Stainless steel		
5	Valve Guide Plate (Seat Bracket)		
6	Cover Gasket	Graphite	
7	Valve Seat	Stainless steel (hardened)	
8	Valve Head (Ball)	Stainless steel (hardened)	
9	Valve Lever (Bucket Arm)	Stainless steel	
10	Air Vent (optional)	Stainless steel	
11	Strainer Screen (optional)		
	B1HS	Stainless steel, 20 mesh	
	B2S to B5S	Stainless steel, 1/16" perf.	
12 A	Cap on strainer models B1HS etc.	Brass	
		Steel	
12 B	Plug in standard model BIH, B2, B3, B4, B5		

Capacities
See TI-P041-02-US

Pressure shell design conditions

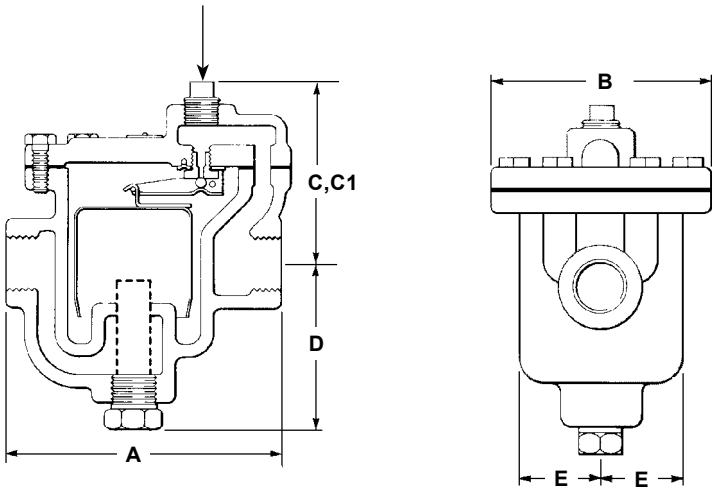
PMA	Maximum allowable pressure	250 psi g/up to 450 °F	(17 bar g/up to 232 °C)
TMA	Maximum allowable temperature	450 °F/0-250 psi g	(232 °C/0-17 bar g)

Limiting operating conditions

PMO Maximum operating pressure	15 psi g	(1 bar g)
	30 psi g	(2 bar g)
	75 psi g	(5 bar g)
Determined by orifice selected. See Capacity and Selection Data on TI-P041-02-US	125 psi g	(9 bar g)
	180 psi g	(12 bar g)
	250 psi g	(17 bar g)
Maximum operating temperature (at all operating pressures)	450 °F	(232 °C)

Dimensions/weights (approximate) in inches (mm) and lbs (kg)

Top plug not provided on B1H-15, 30, 75, 125, B12HS, B2, B22S, B5, B52S.



Size	Type	A	B	C	C1*	D	E	Weight
½", ¾"	B1H	5 (127)	4 (102)	3.3 (84)	3.8 (97)	3 (76)	1.4 (36)	6.2 lb (2.8 kg)
¾"	B2	6.6 (168)	5.3 (135)	3.5 (89)	4.0 (102)	4.1 (104)	1.9 (48)	12.5 lb (5.7 kg)
1"	B3	7.9 (201)	5.9 (150)	4.4 (112)	4.4 (112)	4.8 (122)	2.2 (56)	19.5 lb (8.8 kg)
1-¼"	B4	9.3 (236)	7 (178)	5.6 (142)	5.4 (137)	7.4 (188)	2.3 (58)	40 lb (18.1 kg)
2"	B5	11.2 (284)	8.8 (224)	6.3 (160)	6.6 (168)	10.7 (272)	3.4 (86)	75 lb (34 kg)

*C1 Dimension for traps supplied with bi-metal air vents (B12HS, B22S, B32S, B42S, B52S)

Sample specification

Steam traps shall be of the mechanical inverted bucket type with cast iron bodies, screwed NPT horizontal connections and stainless steel valve head, seat and bucket. An internal bi-metal air vent and/or strainer screen shall be available as options.

Installation

A pipeline strainer should be installed ahead of any trap to protect the head and seat from dirt and scale. Suitable full-port isolation valves should be placed around trap to permit servicing. The trap should be installed below the equipment drainage connection in a horizontal position so that the bucket will rise and fall vertically. For superheated steam applications, a check valve should be installed at the trap inlet.

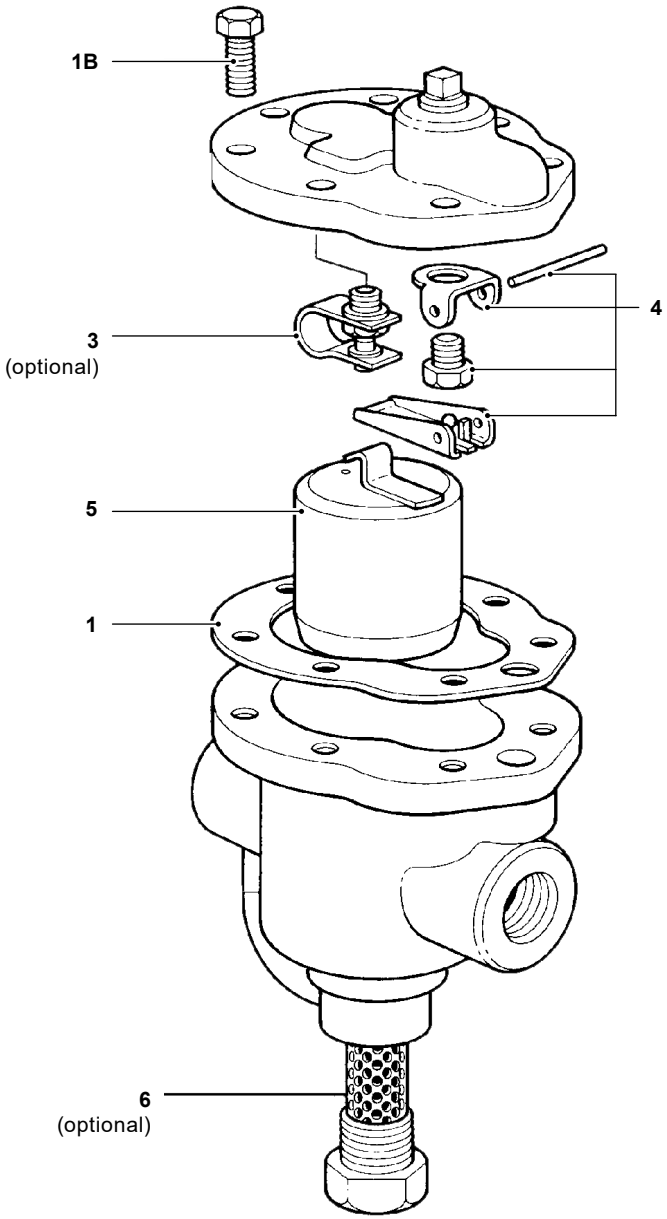
Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation of the trap from both supply and return line is required before any servicing is performed.

The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, and operating mechanism. The bucket vent hole must be clear. The optional strainer screen should be removed and cleaned.
Worn or damaged parts should be replaced using a complete mechanism assembly kit.
Complete installation and maintenance instructions are given in IMI 2.400, which accompanies the product.

Spare parts

Cover Gasket (set of 3)	1
Air Vent Assembly	3
Complete Mechanism (specify pressure range)	4
Bucket (Stainless steel)	5
Strainer (Stainless steel)	6



TI-P041-02-US
Issue 1

Cast Iron Inverted Bucket Steam Trap
B Series Capacities Chart

Capacities lb/hr for Kg/Hr, multiply Lb/Hr by .454

Trap Size →			½" - ¾"	¾"	1"	1¼"	2"
Differential Pressure Range ↓							
1 – 15 psi (0.07 - 1 bar)	Model No. →		B1H-15	B2-15	B3-15	B4-15	B5-15
	Orifice		¼"	⅜"	½"	⅝"	1 1/16"
	1 psi	0.07 bar	665	1700	2140	3940	11,600
	2 psi	0.14 bar	715	1920	2330	4090	12,100
	3 psi	0.21 bar	755	2110	2600	4350	13,200
	5 psi	0.34 bar	835	2370	2920	4980	14,700
	10 psi	0.69 bar	960	2810	3590	5990	17,800
	15 psi	1 bar	1040	3220	3900	6560	20,000
5 – 30 psi (0.34 - 2 bar)	Model No. →		B1H-30	B2-30	B3-30	B4-30	B5-30
	Orifice		3/16"	5/16"	⅜"	½"	¾"
	5 psi	0.34 bar	615	1920	2340	4150	10,000
	10 psi	0.69 bar	715	2260	2840	4930	12,100
	15 psi	1 bar	810	2580	3230	5680	14,000
	20 psi	1.4 bar	895	2870	3630	6200	15,600
	25 psi	1.7 bar	945	3060	3900	6720	17,100
	30 psi	2 bar	1000	3220	4120	7140	18,500
10 – 75 psi (0.69 - 5 bar)	Model No. →		B1H-75	B2-75	B3-75	B4-75	B5-75
	Orifice		5/32"	¼"	9/32"	⅜"	9/16"
	10 psi	0.69 bar	500	1250	1970	3840	9,860
	20 psi	1.4 bar	610	1600	2500	4720	12,400
	30 psi	2 bar	705	1850	2860	5470	13,900
	40 psi	2.8 bar	770	2000	3120	6080	15,200
	60 psi	4.1 bar	905	2350	3640	7150	17,900
	75 psi	5 bar	965	2550	3960	7570	19,200

Continued on next page

Capacities lb/hr for Kg/Hr, multiply Lb/Hr by .454

Trap Size →			½" - ¾"	¾"	1"	1¼"	2"
Differential Pressure Range ↓							
20 – 125 psi (1.4 - 9 bar)	Model No. →		B1H-125	B2-125	B3-125	B4-125	B5-125
	Orifice		1/8"	13/64"	1/4"	11/32"	1/2"
	20 psi	1.4 bar	446	1100	2080	4450	10,800
	40 psi	2.8 bar	600	1220	2600	5530	12,500
	60 psi	4.1 bar	695	1700	3020	6350	15,600
	80 psi	5.5 bar	765	1900	3380	7110	17,100
	100 psi	6.9 bar	830	2080	3640	7750	18,900
	125 psi	9 bar	920	2240	4100	8540	20,000
60 – 180 psi (4.1 - 12.4 bar)	Model No. →		B1H-180	B2-180	B3-180	B4-180	B5-180
	Orifice		3/32"	5/32"	7/32"	9/32"	7/16"
	60 psi	4.1 bar	585	1500	2580	4250	13,650
	80 psi	5.5 bar	642	1700	2830	4730	15,100
	100 psi	6.9 bar	703	1800	3070	5080	16,600
	125 psi	9 bar	765	1940	3380	5680	18,400
	150 psi	10 bar	816	2100	3580	5980	19,100
	180 psi	12.4 bar	867	2220	3780	6300	20,500
125 – 250 psi (9 - 17 bar)	Model No. →		B1H-250	B2-250	B3-250	B4-250	B5-250
	Orifice		.070"	9/64"	3/16"	1/4"	3/8"
	125 psi	9 bar	562	1825	2760	4730	15,000
	150 psi	10 bar	600	1940	2910	4980	16,100
	175 psi	12 bar	630	2060	3120	5130	16,800
	200 psi	13.8 bar	665	2120	3380	5500	17,800
	225 psi	15.5 bar	695	2240	3460	5780	18,900
	250 psi	17 bar	720	2300	3630	6040	19,400

How to select

The table overleaf and above show the maximum capacities on continuous discharge of condensate approximately at steam temperature. Cold water discharge capacities are much higher.

When calculating the capacity requirement for the steam trap, use a safety factor of 2 or 3 times the normal load, depending on the application. Then from the capacity table overleaf, select the trap with the required capacity and pressure range.

Caution: Oversizing bucket traps, especially on light load applications such as main drips, can cause the trap to lose its seal and pass steam.

Be careful to select the inverted bucket trap with a seat suitable for the maximum pressure differential and with sufficient capacity to handle the load at the minimum expected pressure differential. The trap will not open if subjected to pressures greater than the maximum differential pressure.

The capacity table also applies to traps with optional air vents (B12H, B22, etc.)

TI-S03-03
CMGT Issue 6

200 Series
Cast Iron
Inverted Bucket Steam Traps

Description

The Spirax Sarco 200 Series of inverted bucket steam traps are designed for installation in vertical pipework. With cast iron bodies and bolted cover they are maintainable and offer a very wide range of capacities, in applications up to 17 bar g (247 psi g).

Certification

This product is available with certification to EN 10204 2.2.
Note: All certification/inspection requirements must be stated at the time of order placement.

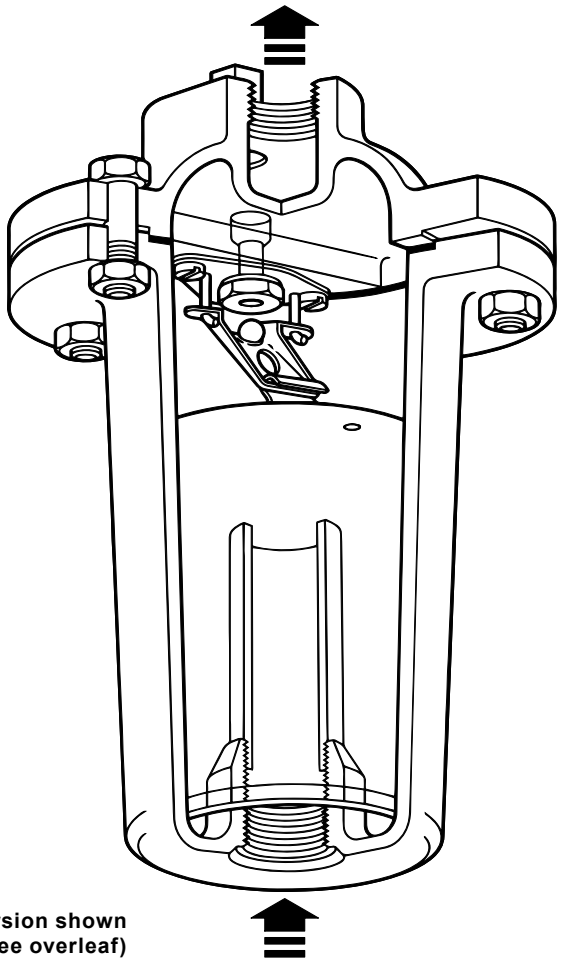
Sizes and pipe connections

½" - 2" screwed BSP or NPT
DN15 - 50 flanged*
*Flanges meet the requirements of BS 4504 DIN PN16, PN10, PN6 and ANSI 125.
In some sizes the inlet and outlet flanges are formed from the body casting and have tapped holes to receive studs.
The stud holes are tapped UNC in ANSI flanges and metric in BS 4504 DIN flanges.

Limiting conditions

Note: Maximum operating conditions depend on the orifice size.

Body design conditions		PN16
PMO	Maximum operating pressure	22 bar g @ 210 °C (319 psi g @ 99 °F)
TMO	Maximum operating temperature	210 °C @ 22 bar g (99 °F @ 319 psi g)
Designed for a maximum cold hydraulic test pressure of		34 bar g (493 psi g)



Screwed version shown
(for details of the flanged version see overleaf)

Δ PMX - Maximum differential pressure

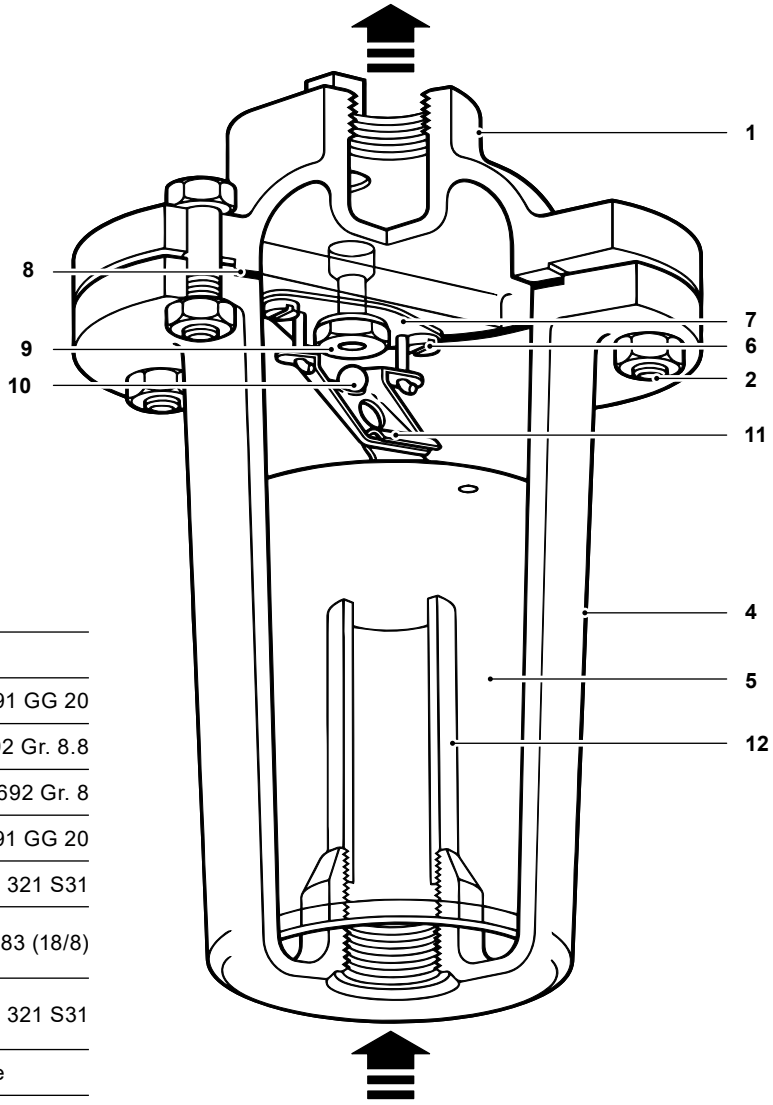
Screwed valves

Size	Δ PMX - Maximum differential pressure bar (psi)						
	2 (29)	2.5 (36.2)	4 (58)	8.5 (123.2)	12.5 (181.2)	13.8 (200.1)	17 (246.5)
½"	211/12	-	211/10	211/8	-	211/7	211/6
¾"	212/16	-	212/12	212/10	-	212/8	212/7
1"	213/24	-	213/20	213/16	213/14	-	213/12
1½"	215/36	-	215/28	215/22	215/20	-	215/18
2"	-	216/48	216/40	216/32	216/28	-	216/24

Flanged valves

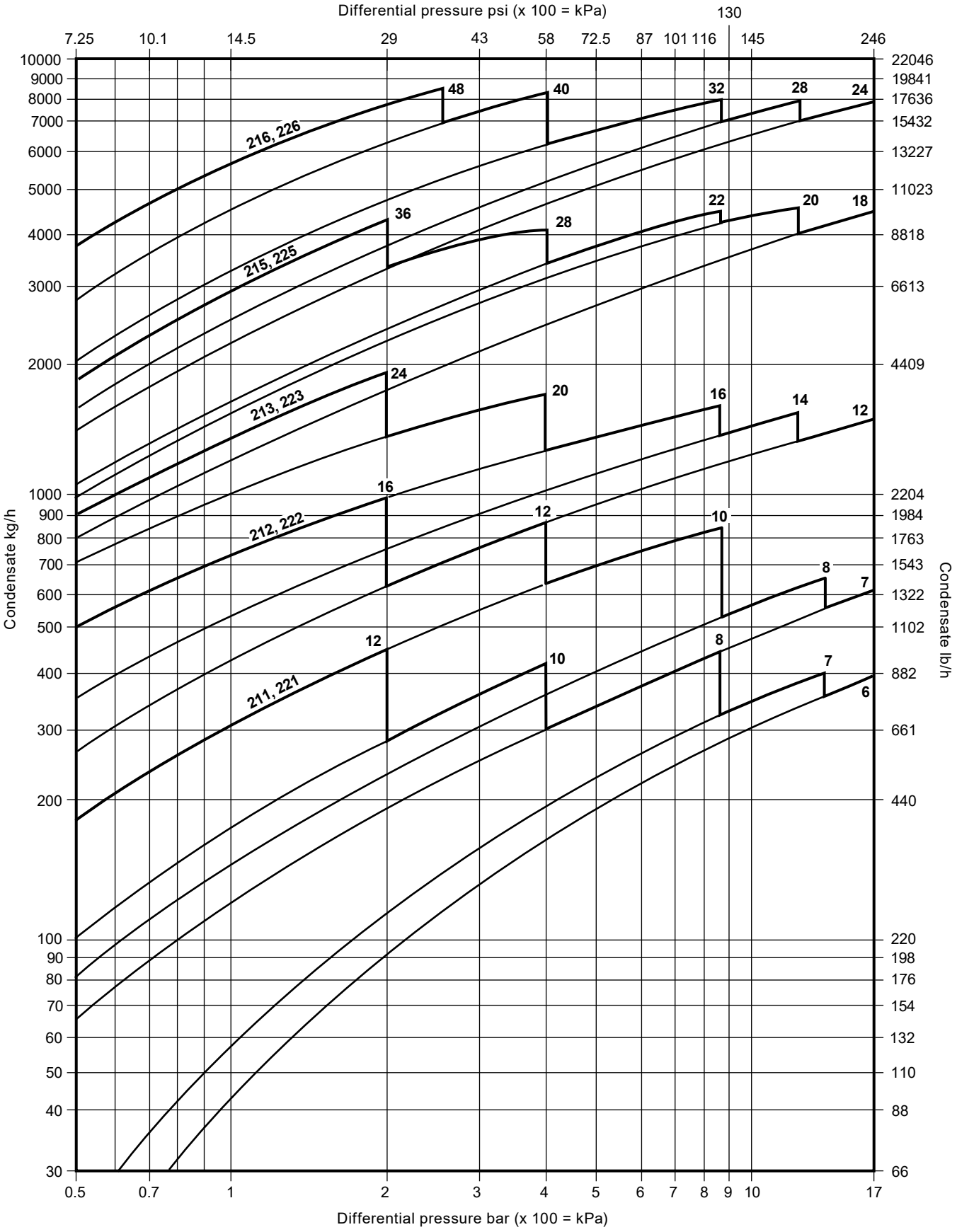
Size	Δ PMX - Maximum differential pressure bar (psi)						
	2 (29)	2.5 (36.2)	4 (58)	8.5 (123.2)	12.5 (181.2)	13.8 (200.1)	17 (246.5)
DN15	221/12	-	221/10	221/8	-	221/7	221/6
DN20	222/16	-	222/12	222/10	-	222/8	222/7
DN25	223/24	-	223/20	223/16	223/14	-	223/12
DN40	225/36	-	225/28	225/22	225/20	-	225/18
DN50	-	226/48	226/40	226/32	226/28	-	226/24

Materials



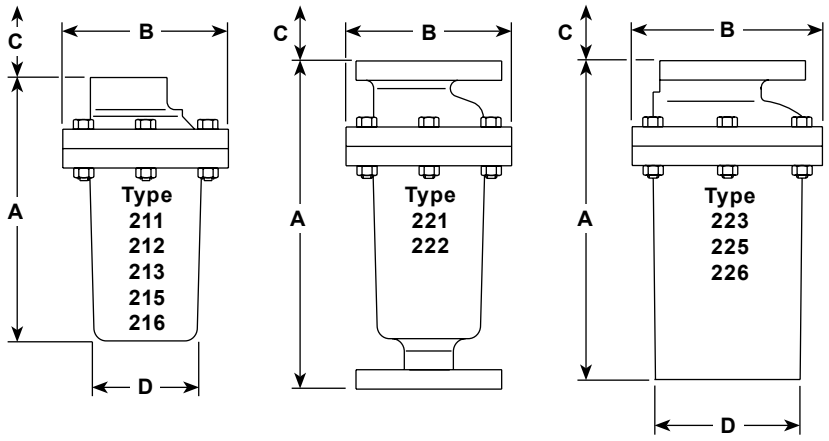
No.	Part	Material	
1	Cover	Cast iron	DIN 1691 GG 20
2	Cover bolts	Steel	BS 3692 Gr. 8.8
	Cover nuts	Steel	BS 3692 Gr. 8
4	Body	Cast iron	DIN 1691 GG 20
5	Bucket	Stainless steel	BS 1449 321 S31
6	Valve guide plate screws	Stainless steel	BS 4183 (18/8)
7	Valve guide plate	Stainless steel	BS 1449 321 S31
8	Cover gasket	Reinforced exfoliated graphite	
9	Valve seat	Stainless steel	AISI 440B
10	Valve	Stainless steel	AISI 440B
11	Valve lever	Stainless steel	BS 1449 321 S31
12	Internal tube	Steel	BS 1387 (MED)

Capacities



Note: Traps should be selected for the most appropriate working pressure differential and not on the basis of load.

Dimensions/weight (approximate) in mm (inches) and kg (lbs)



Type		Size	A	B	C	D	Weight
Screwed	Type 211	½"	163 (6.42)	108 (4.25)	178 (7.01)	67 (2.64)	2.8 (6.17)
	Type 212	¾"	200 (7.87)	135 (5.31)	229 (9.02)	93 (3.66)	5.2 (11.5)
	Type 213	1"	269 (10.6)	188 (7.40)	280 (11.0)	114 (4.49)	12.2 (26.9)
	Type 215	1½"	365 (14.4)	238 (9.37)	380 (15.0)	140 (5.51)	27.0 (59.5)
	Type 216	2"	432 (17.0)	286 (11.3)	470 (18.5)	185 (7.28)	43.5 (95.9)
Flanged	Type 221	DN15	215 (8.46)	108 (4.25)	254 (10)	-	4.9 (10.8)
	Type 222	DN20	286 (11.3)	135 (5.31)	280 (11.0)	-	9.1 (20.1)
	Type 223	DN25	305 (12.0)	188 (7.40)	305 (12.0)	121 (4.76)	16.3 (35.9)
	Type 225	DN40	370 (14.6)	238 (9.37)	380 (15.0)	140 (5.51)	30.8 (67.9)
	Type 226	DN50	450 (17.7)	286 (11.3)	457 (18.0)	165 (6.50)	49.4 (109)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-S03-08) supplied with the product.
The trap must be installed with the body upright so that the bucket is rising and falling vertically. The inlet should be at the bottom with the trap installed below the drain point so that a water seal can be maintained around the end of the bucket.

Disposal

The product is recyclable. No ecological hazard is anticipated with disposal of this product providing due care is taken.

How to order

Example: 1 off DN40 225/18 Spirax Sarco inverted bucket steam trap with flanged PN16 connections.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

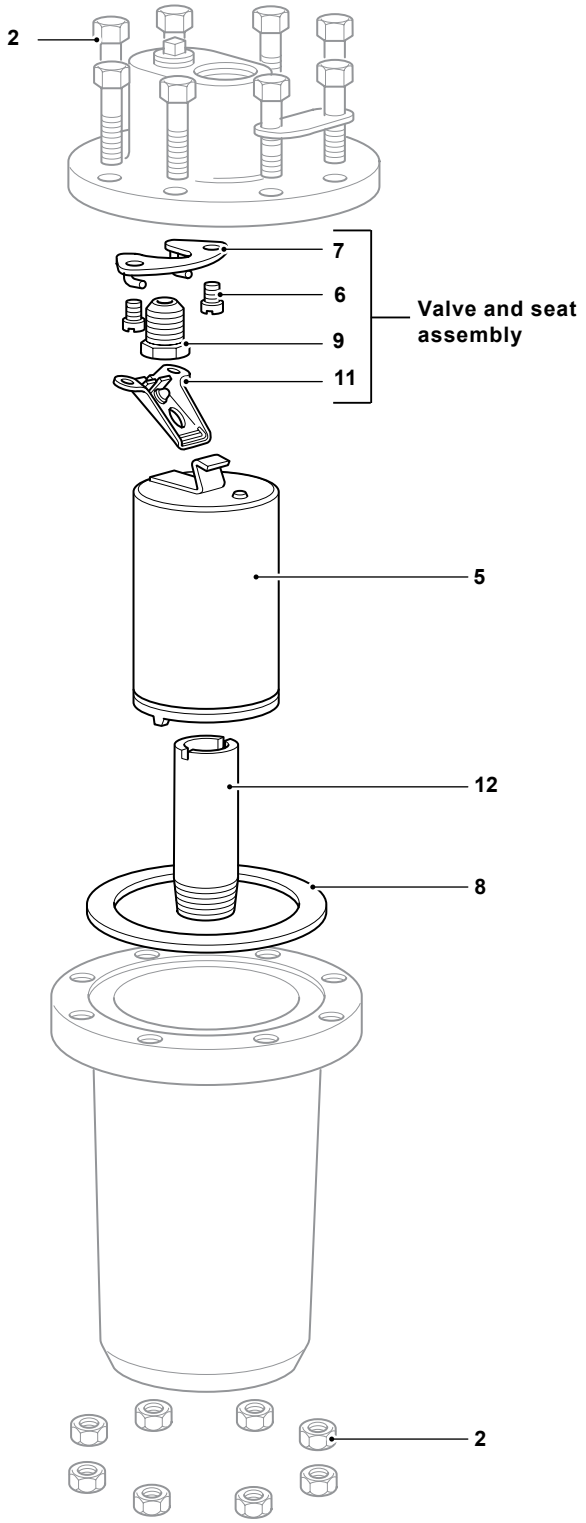
Available spares

Valve and seat assembly (state pressure range)	**6 (2 off), 7, 9, 11**
Bucket	**5**
Internal tube	**12**
Cover gasket (packet of 3)	**8**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and full definition of the trap e.g. 212/10.

Example: 1 - Valve and seat assembly for a ¾" Spirax Sarco inverted bucket steam trap Series 212/10.



Recommended tightening torques

Item	Part	or mm	N m
2 (6 off)	½" - DN15	M8 x 35	18 - 22
2 (8 off)	¾" - DN20	M10 x 40	16 - 20
2 (10 off)	1" - DN25	M12 x 60	24 - 28
2 (12 off)	1½" - DN40	M16 x 75	60 - 66
2 (12 off)	2" - DN50	M16 x 75	64 - 70
6	½" - DN15	2BA x 5/16"	4 - 5
	¾"- DN20	2BA x 5/16"	4 - 5
	1" - DN25	¼" WHIT x ½"	10 - 12
	1½"- DN40	¼" WHIT x ½"	10 - 12
	2" - DN50	5/16" WHIT x ½"	14 - 16
9	½"- DN15	½"AF	23 - 27
	¾"- DN20	5/8"AF	40 - 44
	1"- DN25	7/8"AF	80 - 88
	1½"- DN40	1¼"AF	175 - 190
	2"- DN50	1½"AF	270 - 300
12	½" - 2" DN15 - DN50	1½"AF	60 - 70

TI-P072-01
CMGT Issue 10

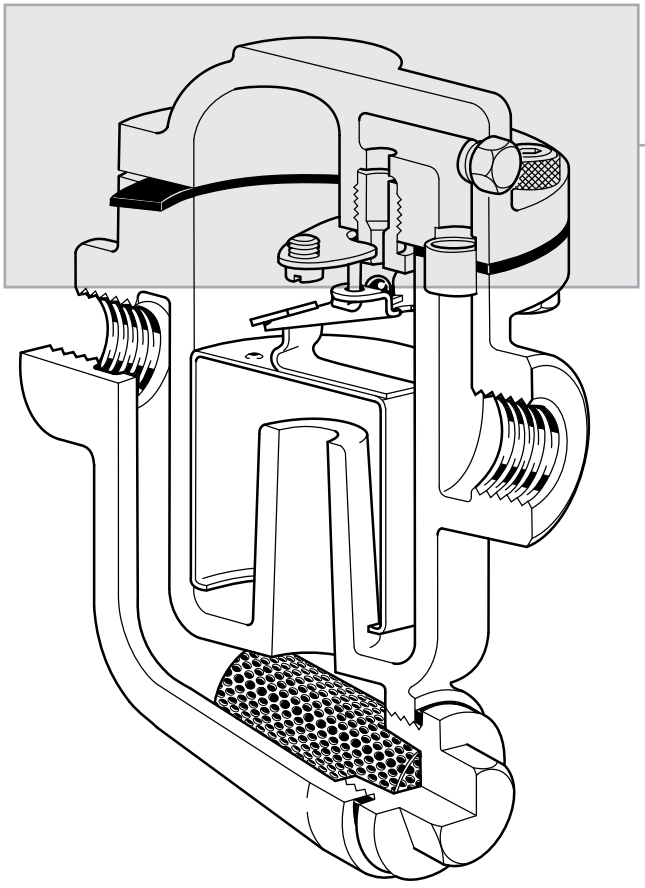
HM34 Series
Carbon Steel
Inverted Bucket Steam Traps

Description
The HM34 is an inverted bucket steam trap manufactured in carbon steel with an internal strainer fitted as standard.
It is designed for use on horizontal installations and will operate on steam pressures up to 32 bar g.

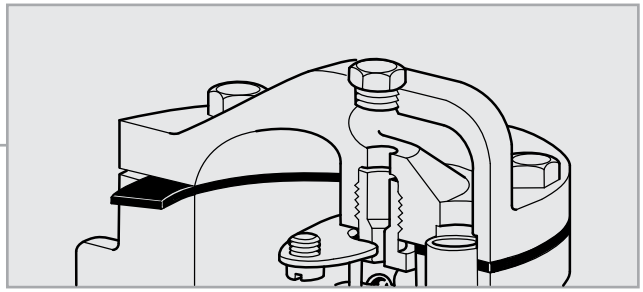
Standards
This product fully complies with the requirements of the Pressure Equipment Directive 2014/68/EU.

Certification
This product is available with certification to EN 10204 2.2.
Note: All certification/inspection requirements must be stated at the time of order placement.

Size ½" and ¾"



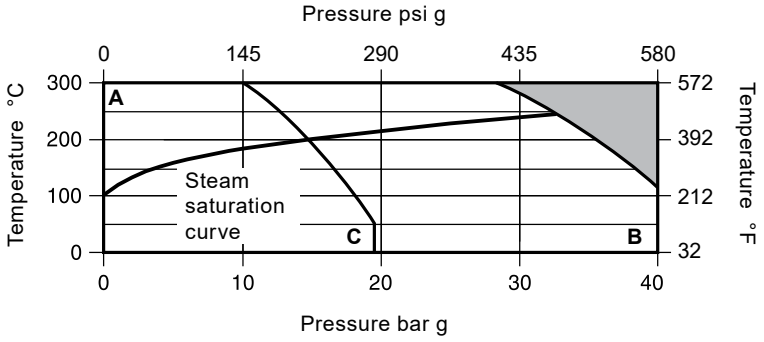
Size 1"



Drawing to show difference in top connection for 1" model

Sizes and pipe connections
½", ¾" and 1" screwed BSP T Rp (ISO 7-1) or NPT.
DN25 socket weld ends BS 3799 Class 3000.
DN15, DN20 and DN25 standard flange EN 1092 PN40.
Available on request: Flanged Class 150 and Class 300 connections.

Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

A - B Screwed, socket weld, flanged EN 1092 PN40 and Class 300.

A - C Flanged Class 150

Body design conditions		PN40
PMA Maximum allowable pressure	40 bar g @ 120 °C	580 psi g @ 248 °F
TMA Maximum allowable temperature	300 °C	572 °F
Minimum allowable temperature	-10 °C	14 °F
PMO Maximum operating pressure for saturated steam service	32 bar g	464 psi g
TMO Maximum operating temperature	300 °C	572 °F
Minimum operating temperature	0 °C	32 °F

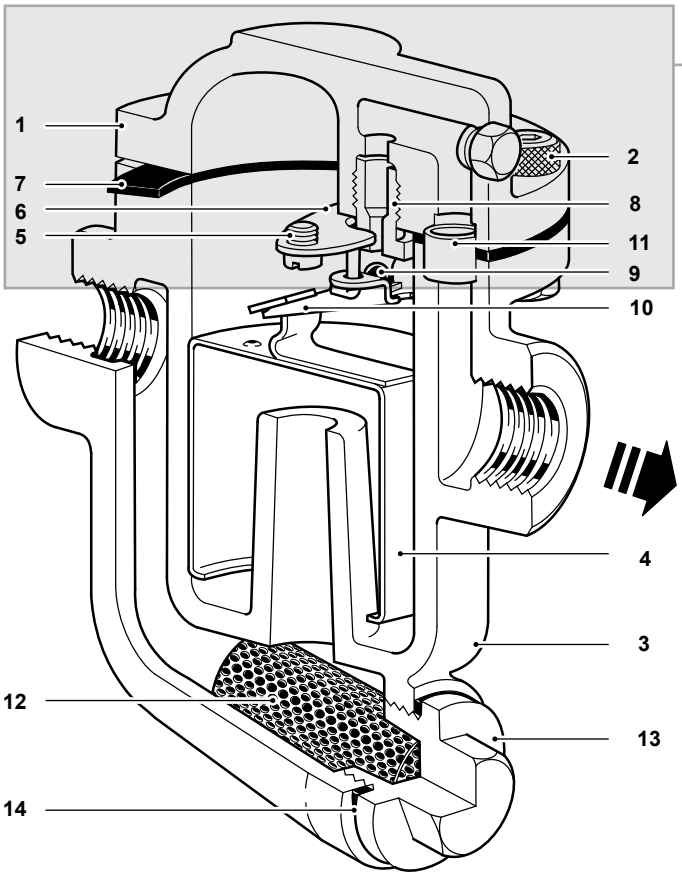
ΔPMX Maximum differential pressure

Size	4 bar (58 psi)	8.5 bar (123 psi)	12 bar (174 psi)	20 bar (290 psi)	32 bar (464 psi)
DN15 - ½"	HM34/8	HM34/7	HM34/6	HM34/5	HM34/4
DN20 - ¾"	HM34/10	HM34/8	HM34/7	HM34/6	HM34/5
DN25 - 1"	HM34/12	HM34/10	HM34/8	HM34/6	HM34/5

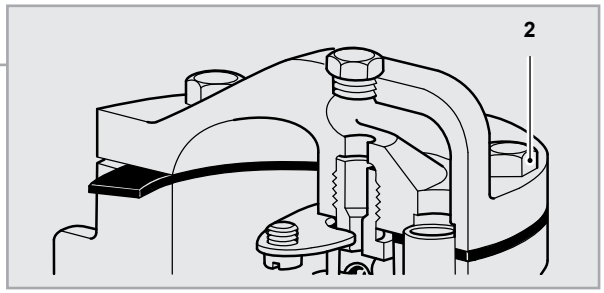
Designed for a maximum cold hydraulic test pressure of:	60 bar g	870 psi g

Materials

Size ½" and ¾"



Size 1"

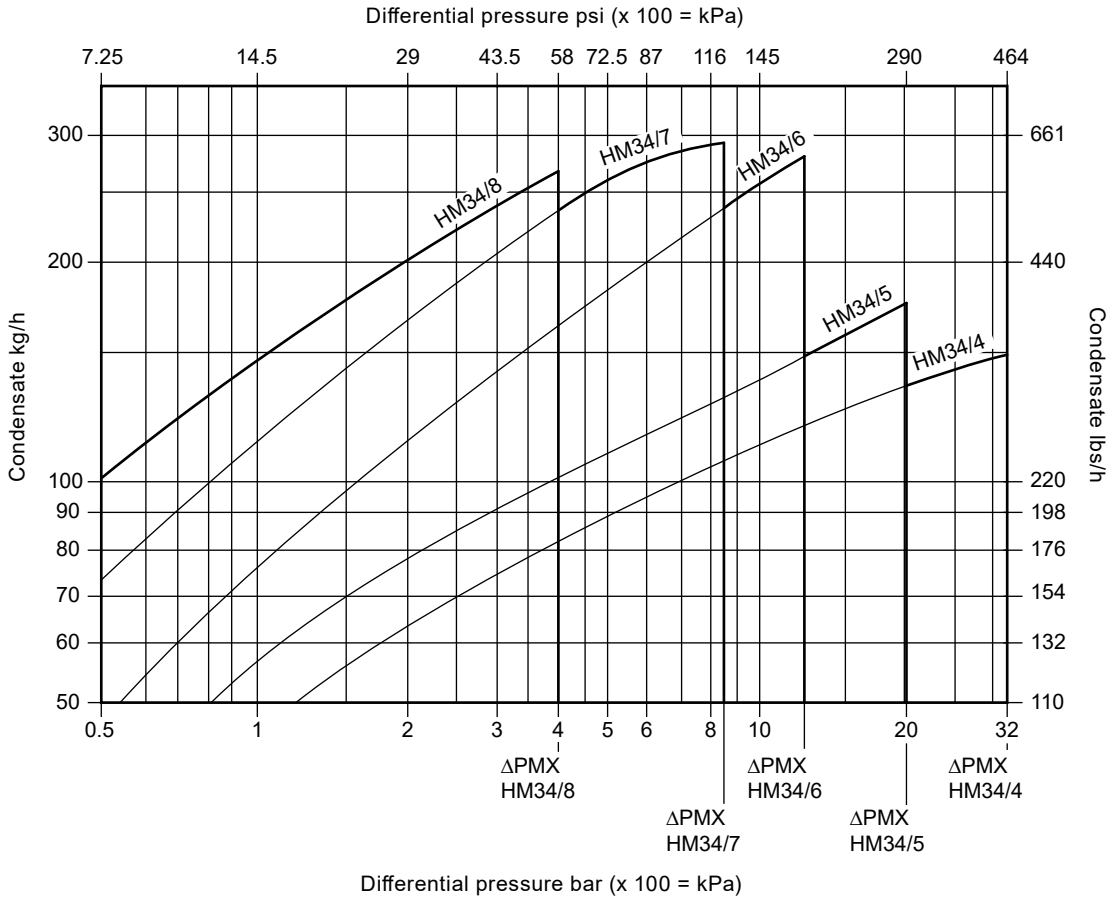


Drawing to show difference in top connection for 1" model

No.	Part		Material	
1	Cover	½", ¾"	Forged steel	1.0460 (C22.8)
		1"	Cast steel	1.0619 +N
	Cover screws	½", ¾"	Steel	BS 4168 Gr. 8.8
2	Cover bolts	1"	Steel	BS 3692 Gr. 8.8
	Cover nuts	½", ¾", 1"	Steel	BS 3692 Gr. 8.8
3	Body		Cast steel	1.0619 +N
4	Bucket		Stainless steel	BS 1449 304 S31
5	Valve guide plate screw		Stainless steel M 4.5 x 10	BS 4183 18/8
6	Valve guide plate		Stainless steel	BS 1449 304 S11
7	Cover gasket		Reinforced exfoliated graphite	
8	Valve seat		Stainless steel	AISI 431
9	Valve		Stainless steel	AISI 440B
10	Valve lever		Stainless steel	BS 1449 321 S31
11	Ferrule	½",¾"	Stainless steel	BS 970 321 S31
		1"	Stainless steel	BS 3605 (CFS) 304 S14
12	Strainer screen		Stainless steel	ASTM A240 316L
13	Strainer cap		Steel	1.0460 (C22.8)
14	Strainer gasket		Reinforced exfoliated graphite	

Capacities

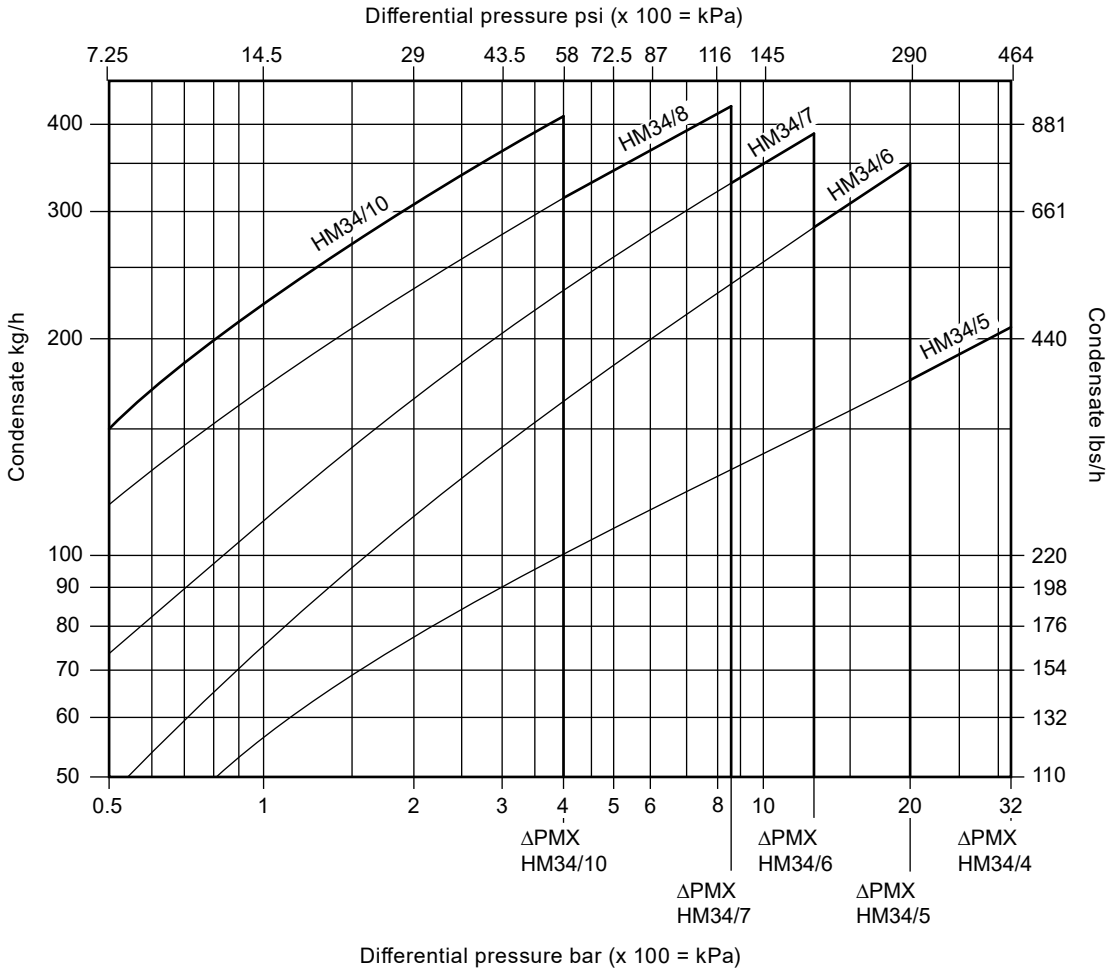
½"
DN15



Selection note

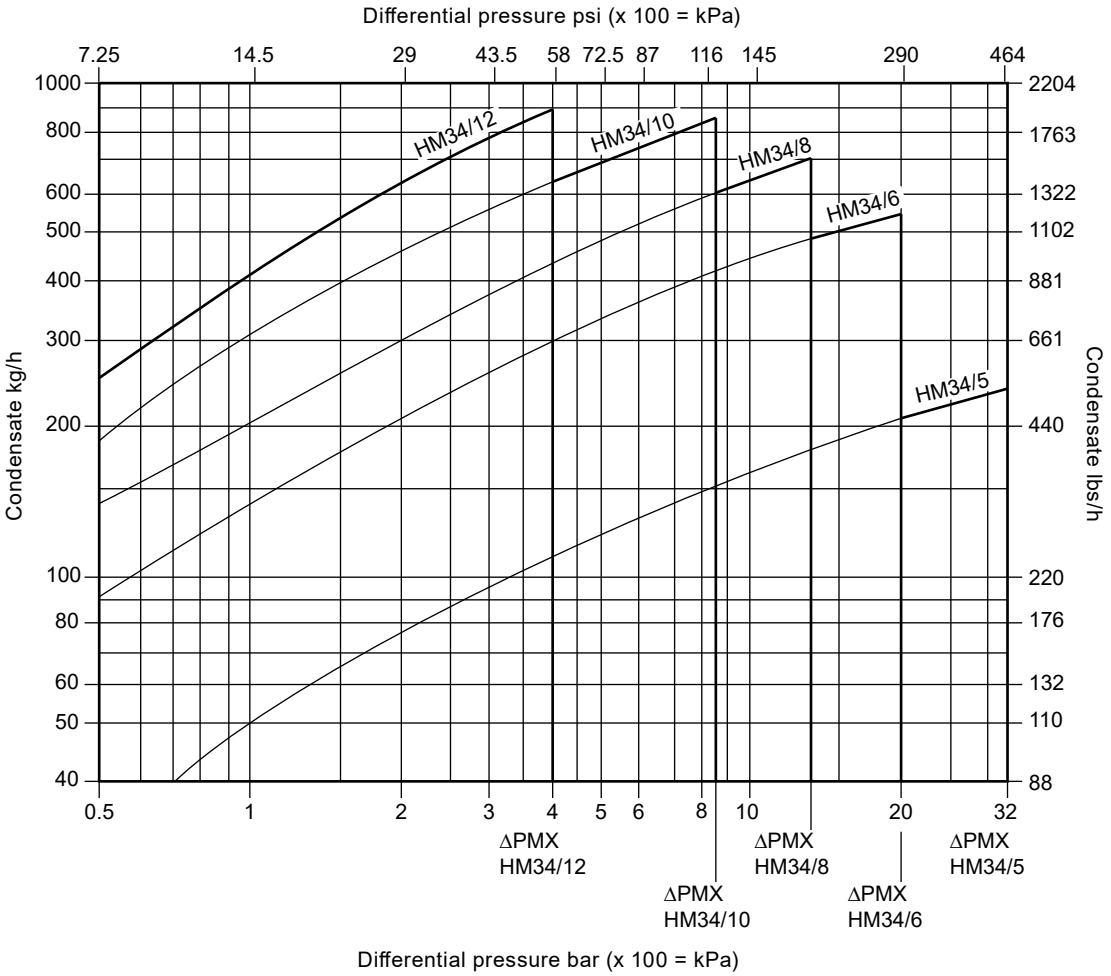
Traps should be selected for the most appropriate working pressure differential and not on the basis of load, For example; DN25 HM34 with a load of 80 kg/h (176.3 lbs) at 7 bar (101.5 psi) differential should be handled by an HM34/10 and not an HM34/5.

¾"
DN20



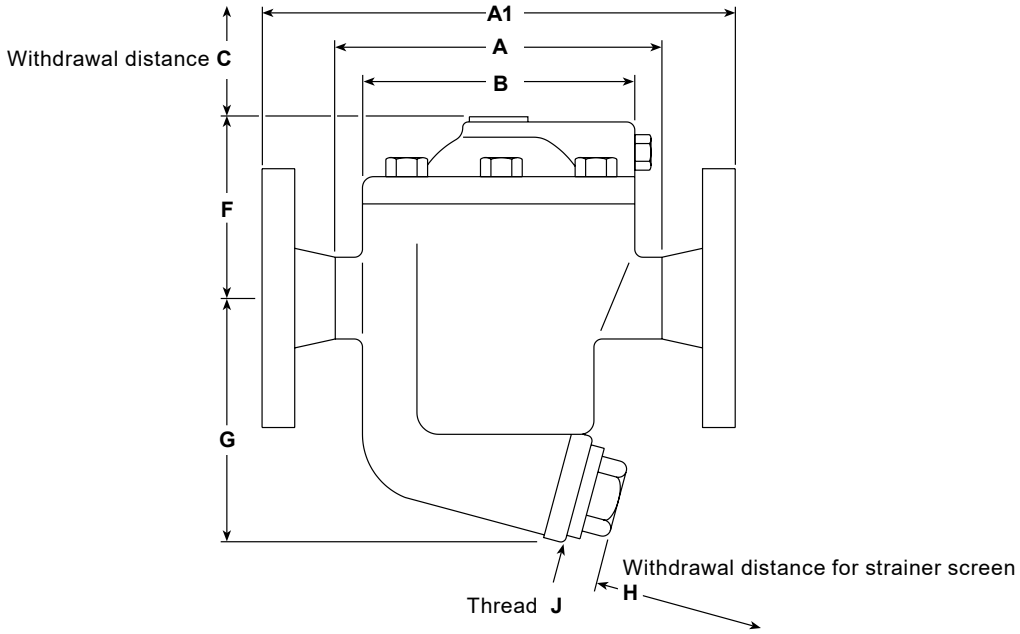
Selection note
Traps should be selected for the most appropriate working pressure differential and not on the basis of load, For example; DN25 HM34 with a load of 80 kg/h (176.3 lbs) at 7 bar (101.5 psi) differential should be handled by an HM34/10 and not an HM34/5.

1"
DN25



Selection note
Traps should be selected for the most appropriate working pressure differential and not on the basis of load, For example; DN25 HM34 with a load of 80 kg/h (176.3 lbs) at 7 bar (101.5 psi) differential should be handled by an HM34/10 and not an HM34/5.

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Screwed and socket weld connections

Size	A	B	C	F	G	H	J	Weight
½"	120 (4.72)	105 (4.13)	100 (3.94)	67 (2.64)	89 (3.50)	65 (2.56)	M28	2.6 (5.7)
¾"				88 (3.46)	107 (4.21)		M28	4.0 (8.8)
1"	180 (7.09)	160 (6.30)	160 (6.30)	145 (5.71)	120 (4.72)	85 (3.35)	M32	10.4 (22.9)

Flanged connections

Size	A1	B	C	F	G	H	J	Weight
DN15	210 (8.27)	105 (4.13)	100 (3.94)	67 (2.64)	89 (3.50)	65 (2.56)	M28	4.5 (9.9)
DN20				88 (3.46)	107 (4.21)		M28	7.0 (15)
DN25	230 (9.06)	160 (6.30)	160 (6.30)	145 (5.71)	120 (4.72)	85 (3.35)	M32	12.0 (26.5)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-S03-11) supplied with the product.

Installation note

The trap must be installed with the body upright so that the bucket is rising and falling vertically. The inlet and outlet connections should be in a horizontal plane, with the trap installed below the drain point so that a water seal can be maintained around the open end of the bucket.

Disposal

This product is recycable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

How to order

Example: 1 off Spirax Sarco ½" HM34/8 inverted bucket steam trap with screwed BSP T Rp (ISO 7-1) connections.

Spare parts

The spare parts available are shown in solid outline. Parts shown in a grey line are not supplied as spares.

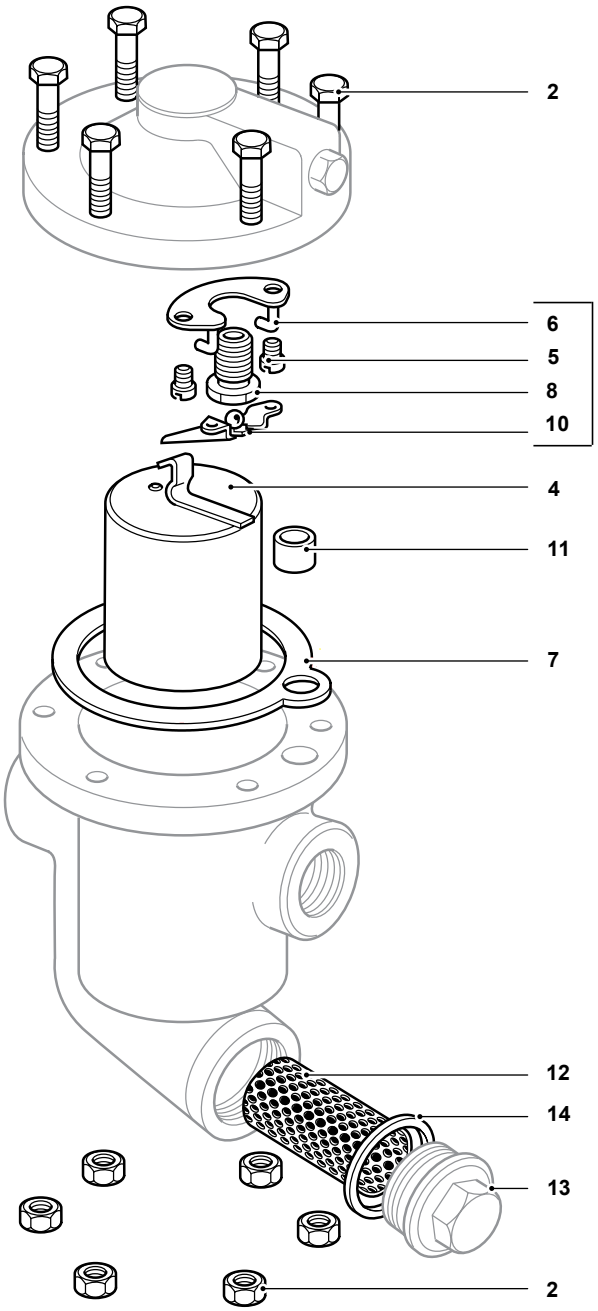
Available spares

Valve and seat assembly		**5** (2 off), **6, 8, 10**
Bucket		**4**
Cover gasket and ferrule	(packet of 3 each)	**7, 11**
Strainer screen		**12**
Strainer screen gasket	(packet of 3 each)	**14**
Set of cover bolts and nuts	(set of 6)	**2**

How to order spares

Always order spare parts by using the description given in the column headed 'Available spares' and state the size, type of trap and pressure range.

Example: 1 off Valve and seat assembly for a Spirax Sarco DN25 HM34/7 inverted bucket steam trap.



Recommended tightening torques

Item	Size	or mm		N m	(lbf ft)
2	½", ¾"		M8 x 30	25 - 28	(18-21)
	1		M12 x 45	25 - 28	(18-21)
8	½", ¾"	13	-	50 - 55	(37-41)
	1"	17	-	80 - 88	(59-65)
13	½", ¾"	22	M28	90 - 100	(66-74)
	1"	27	M32	125 - 145	(92-107)

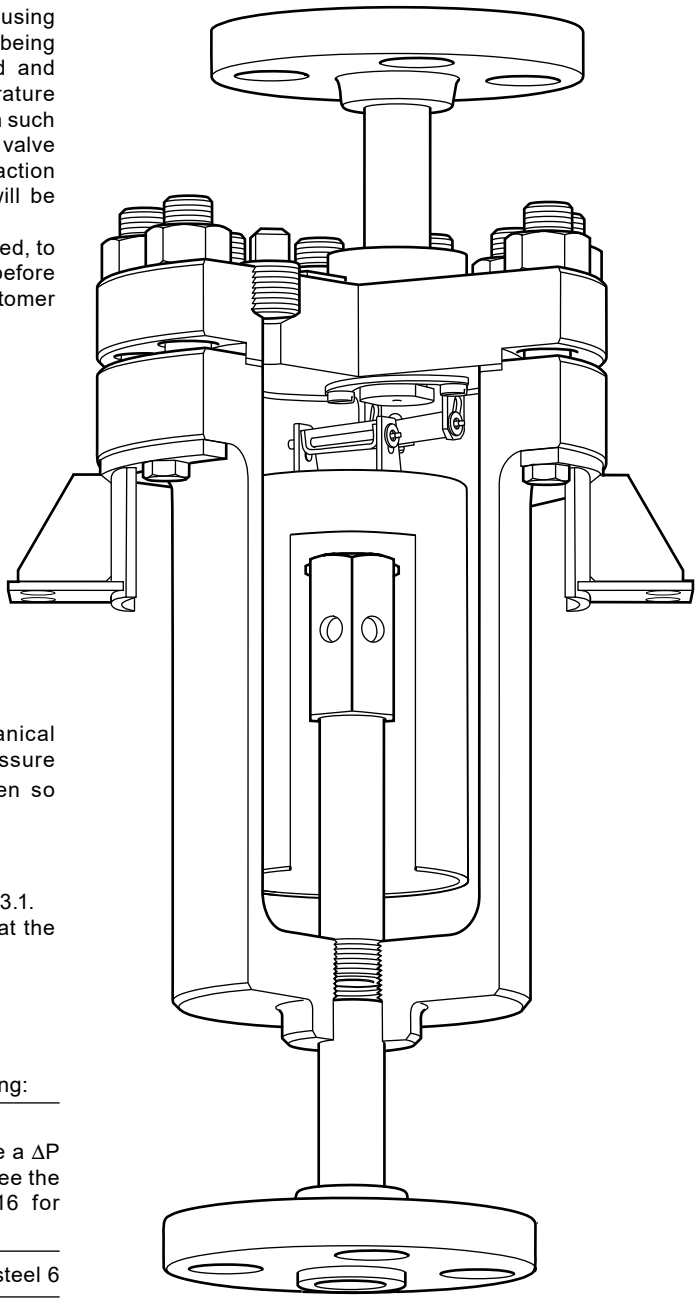
TI-P067-10
CMGT Issue 4

IBV Series C
Carbon Steel
Inverted Bucket Vertical Steam Trap

Description

The IBV series C inverted bucket steam trap is manufactured using carbon steel for the body and cover; with internal components being made of stainless steel. It is suitable for use with saturated and superheated steam and in high pressure and high temperature applications. The IBV is fully automatic and has been designed in such a way that there is minimal friction from mechanism movement; valve closure is immediate, without any steam loss and the discharge action is positive with no equivocal phases. The standard version will be supplied with bolted support brackets.

On the cover of the IBV there in a ⅜" hole, threaded and plugged, to eliminate any water discharge after being hydraulically tested before leaving the factory. This hole can be reopened on site for the customer to perform periodic hydro testing.



Standards

This steam trap is designed following the ASME VIII Mechanical Design Code and complies with the requirements of the Pressure Equipment Directive (PED) and carries the CE mark when so required.

Certification

The product is available with material certification to EN 10204 3.1.

Note: All certification/inspection requirements must be stated at the time of order placement.

Optional extras

On request the IBV steam trap can be equipped with the following:

An **inbuilt stainless steel check valve**

Please note that this option is only available for units that have a ΔP maximum differential pressure of 40 bar (580 psi) and above - See the IBV product nomenclature and selection guide on page 16 for clarification.

A **Stellite plug and seat**	Alloy steel 6

Available types

Series C	**Carbon steel** body and cover	
Series C-LF2	**Carbon steel** body and cover with a material specification of **A350 LF2** for low temperature applications down to -46 °C (-50.8 °F)	**See** TI-P067-13
Series Z	**Alloy steel** body and cover	**See** TI-P067-15

Sizes and pipe connections

Please note that all standard flanges (as noted below) will be slip-on type. Weld-neck type flanges can be supplied to special order and must be specified at the time of order placement.

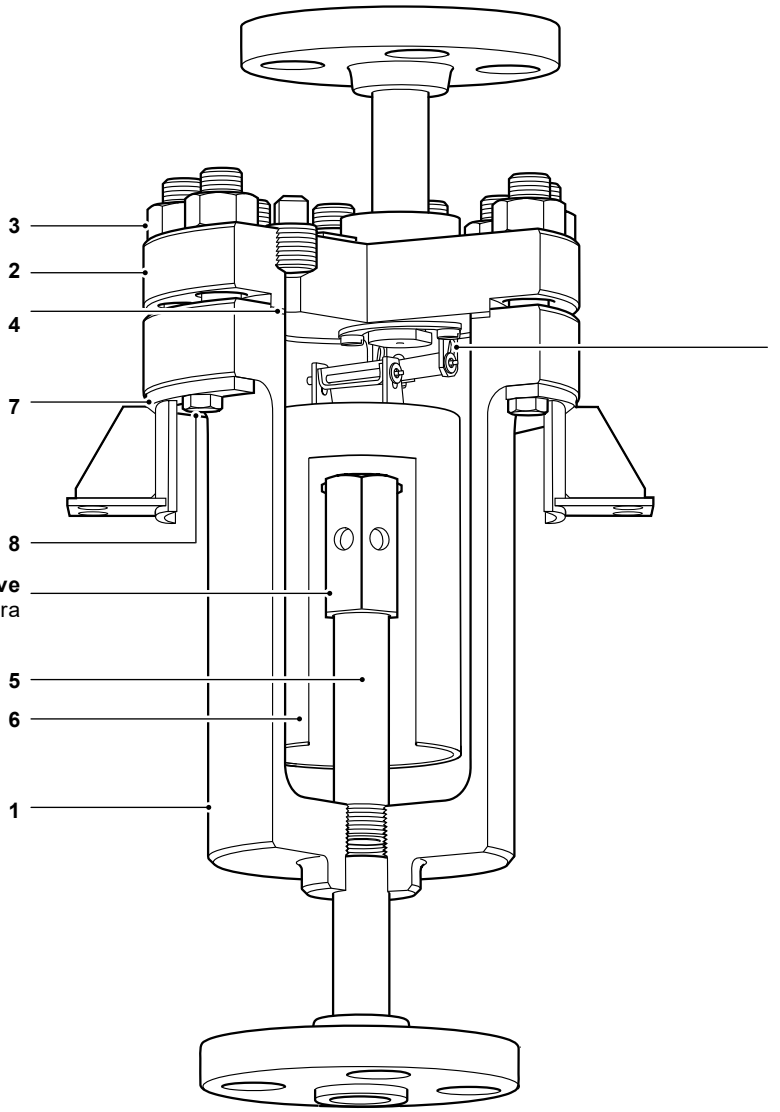
½", ¾", 1", 1½", 2" and 3"
Screwed BSP or NPT
Socket weld, according to ASME B 16.11

½", ¾", 1", 1½", 2" and 3"
Flanged ASME B 16.5 ASME Class 150, 300, 600, 900 and 1500*

DN15, DN20, DN25, DN40, DN50 and DN80
Flanged EN 1092 PN16, PN25, PN40, PN63, PN100 and PN160*

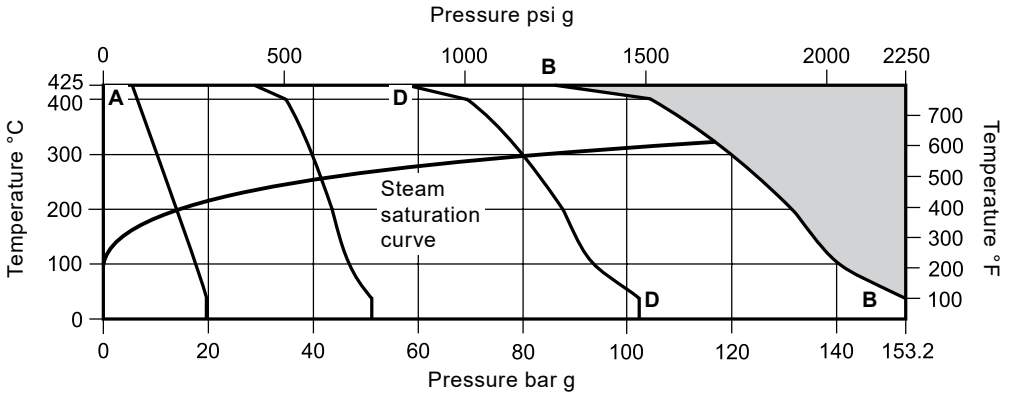
* **Note:** that the flanged **ASME Class 1500** units are **limited to a body rating of ASME Class 900**.

Materials



No.	Part	Material	
1	Body	Carbon steel	SA105
2	Cover	Carbon steel	SA105
3	Stud bolts	Carbon steel	SA193 Gr.B7
	Nuts	Carbon steel	SA194 Gr 2H
	Nace version	(external only)	ASTM A479 XM-19
		Stud Bolts	SA479XM-19
		Nuts	SA194 Gr.8M
4	Cover gasket	Reinforced graphite	
5	Channelling pipe	Stainless steel	SA106 Gr. B
6	Bucket	Stainless steel	AISI 316
7	Support bracket	Stainless steel	SA516 Gr.60
8	Bracket screw	Stainless steel	AISI 316
9	Lever pin	Stainless steel	AISI 316
10	Split pin	Stainless steel	AISI 316
11	Valve seat	Stainless steel	400 series
12	Valve head	Stainless steel	400 series
13	Valve lever	Stainless steel	AISI 316

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged ASME

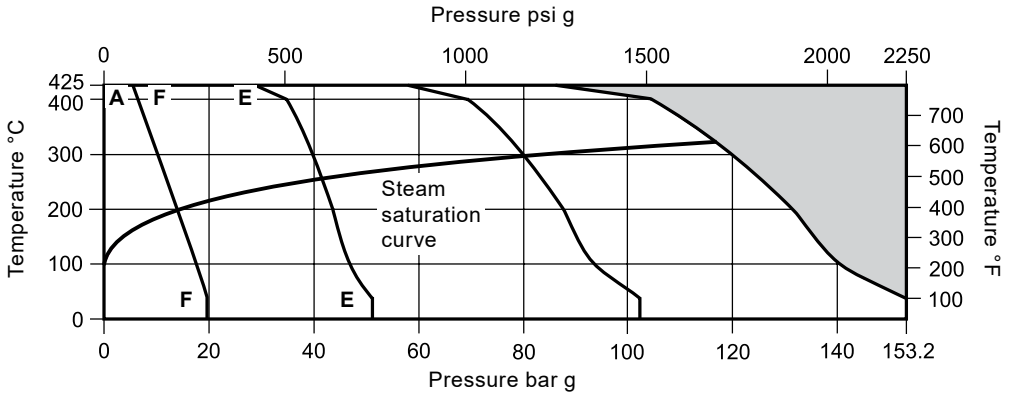


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

			Body design conditions		ASME Class 900
A-B-B	Screwed and Socket weld ASME Class 900		PMA - Maximum allowable pressure	153.2 bar g @ 38 °C	2 220 psi g @ 100 °F
			TMA - Maximum allowable temperature	425 °C @ 86.3 bar g	797 @ 1252 psi g
			Minimum allowable temperature	-29 °C	-20 °F
		*	PMO (PS) - Maximum operating pressure for saturated steam service	116.3 bar g @ 323 °C	1 687 psi g @ 613 °F
			TMO (TS) - Maximum operating temperature for saturated steam service	323 °C @ 116.3 bar g	613 °F @ 1 687 psi g
			Designed for a maximum cold hydraulic test pressure of:	229.8 bar g	3 333 psi g
A-D-D	ASME Class 600		PMA - Maximum allowable pressure	102.1 bar g @ 38 °C	1 481 @ 100 °F
			TMA - Maximum allowable temperature	425 °C @ 57.5 bar g	800 °F @ 825 psi g
			Minimum allowable temperature	-29 °C	-20 °F
		*	PMO (PS) - Maximum operating pressure for saturated steam service	79.9 bar g @ 295 °C	1 159 psi g @ 563 °F
			TMO (TS) - Maximum operating temperature for saturated steam service	295 °C @ 79.9 bar g	563 °F @ 1 159 psi g
			Designed for a maximum cold hydraulic test pressure of:	153.1 bar g	2 221 psi g

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged ASME (cont'd)

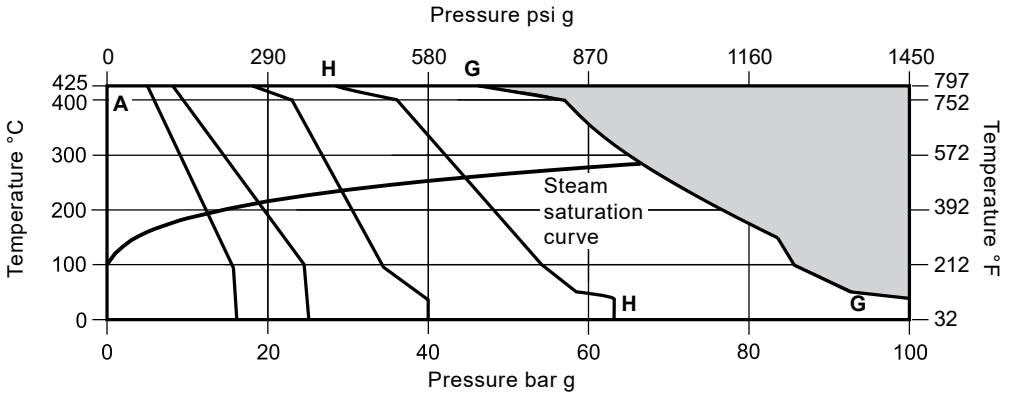


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

A-E-E	**ASME Class 300**		PMA - Maximum allowable pressure	51.1 bar g @ 38 °C	741 psi g @ 100 °F
			TMA - Maximum allowable temperature	425 °C @ 28.8 bar g	797 °F @ 410 psi g
			Minimum allowable temperature	-29 °C	-20 °F
		*	PMO (PS) - Maximum operating pressure for saturated steam service	41.7 bar g @ 254 °C	605 psi g @ 489 °F
			TMO (TS) - Maximum operating temperature for saturated steam service	254 °C @ 41.7 bar g	489 °F @ 605 psi g
			Designed for a maximum cold hydraulic test pressure of:	76.6 bar g	1111 psi g
A-F-F	**ASME Class 150**		PMA - Maximum allowable pressure	19.6 bar g @ 38 °C	284 psi g @ 100 °F
			TMA - Maximum allowable temperature	425 °C @ 5.5 bar g	797 °F @ 80 psi g
			Minimum allowable temperature	-29 °C	-20 °F
		*	PMO (PS) - Maximum operating pressure for saturated steam service	13.8 bar g @ 197 °C	200 psi g @ 387 °F
			TMO (TS) - Maximum operating temperature for saturated steam service	197 °C @ 13.8 bar g	387 °F @ 200 psi g
			Designed for a maximum cold hydraulic test pressure of:	29.4 bar g	426 psi g

Pressure/temperature limits (ISO 6552) - Flanged EN1092-1

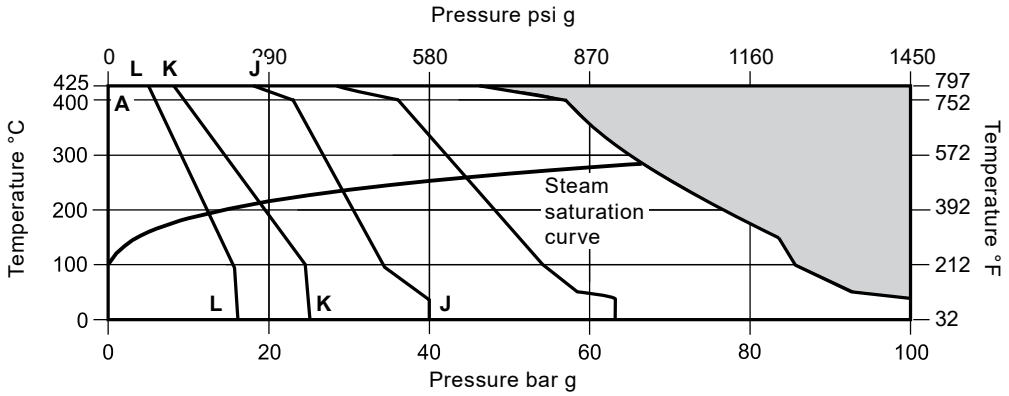


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

		Body design conditions			PN100
A-G-G	PN100	PMA - Maximum allowable pressure		100 bar g @ 50 °C	1450 psi g @ 122 °F
		TMA - Maximum allowable temperature		425 °C @ 44.9 bar g	797 °F @ 651 psi g
		Minimum allowable temperature		-29 °C	-20.2 °F
		* PMO (PS) -	Maximum operating pressure for saturated steam service	66 bar g	957 psi g
		TMO (TS)	Maximum operating temperature for saturated steam service	283 °C @ 44.9 bar g	541 °F @ 651 psi g
		Designed for a maximum cold hydraulic test pressure of:		143 bar g	2074 psi g
A-H-H	PN63	PMA - Maximum allowable pressure		63 bar g @ 50 °C	914 psi g @ 122 °F
		TMA - Maximum allowable temperature		425 °C @ 28.3 bar g	797 °F @ 410 psi g
		Minimum allowable temperature		-29 °C	-20.2 °F
		* PMO (PS) -	Maximum operating pressure for saturated steam service	44 bar g	638 psi g
		TMO (TS)	Maximum operating temperature for saturated steam service	257 °C @ 28.3 bar g	495 °F @ 410 psi g
		Designed for a maximum cold hydraulic test pressure of:		90 bar g	1305 psi g

Pressure/temperature limits (ISO 6552) - Flanged EN1092-1 (continued)



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

A-J-J	**PN40**	PMA - Maximum allowable pressure	40 bar g @ 50 °C	580 psi g @ 122 °F
		TMA - Maximum allowable temperature	425 °C @ 17.9 bar g	797 °F @ 260 psi g
		Minimum allowable temperature	-29 °C	-20.2 °F
		* PMO (PS) - Maximum operating pressure for saturated steam service	29 bar g	421 psi g
		TMO (TS) Maximum operating temperature for saturated steam service	234 °C @ 17.5 bar g	453 °F @ 254 psi g
		Designed for a maximum cold hydraulic test pressure of:	57.2 bar g	830 psi g
A-K-K	**PN25**	PMA - Maximum allowable pressure	25 bar g @ 50 °C	363 psi g @ 122 °F
		TMA - Maximum allowable temperature	425 °C @ 11.2 bar g	797 °F @ 162 psi g
		Minimum allowable temperature	-29 °C	-20.2 °F
		* PMO (PS) - Maximum operating pressure for saturated steam service	19 bar g	276 psi g
		TMO (TS) Maximum operating temperature for saturated steam service	212 °C @ 11.2 bar g	414 °F @ 162 psi g
		Designed for a maximum cold hydraulic test pressure of:	35.7 bar g	518 psi g
A-L-L	**PN16**	PMA - Maximum allowable pressure	16 bar g @ 50 °C	232 psi g @ 122 °F
		TMA - Maximum allowable temperature	425 °C @ 7.1 bar g	797 °F @ 103 psi g
		Minimum allowable temperature	-29 °C	-20.2 °F
		* PMO (PS) - Maximum operating pressure for saturated steam service	12 bar g	174 psi g
		TMO (TS) Maximum operating temperature for saturated steam service	191 °C @ 7.1 bar g	376 °F @ 103 psi g
		Designed for a maximum cold hydraulic test pressure of:	22.8 bar g	331 psi g

Capacities - DN15

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 500 kg/h

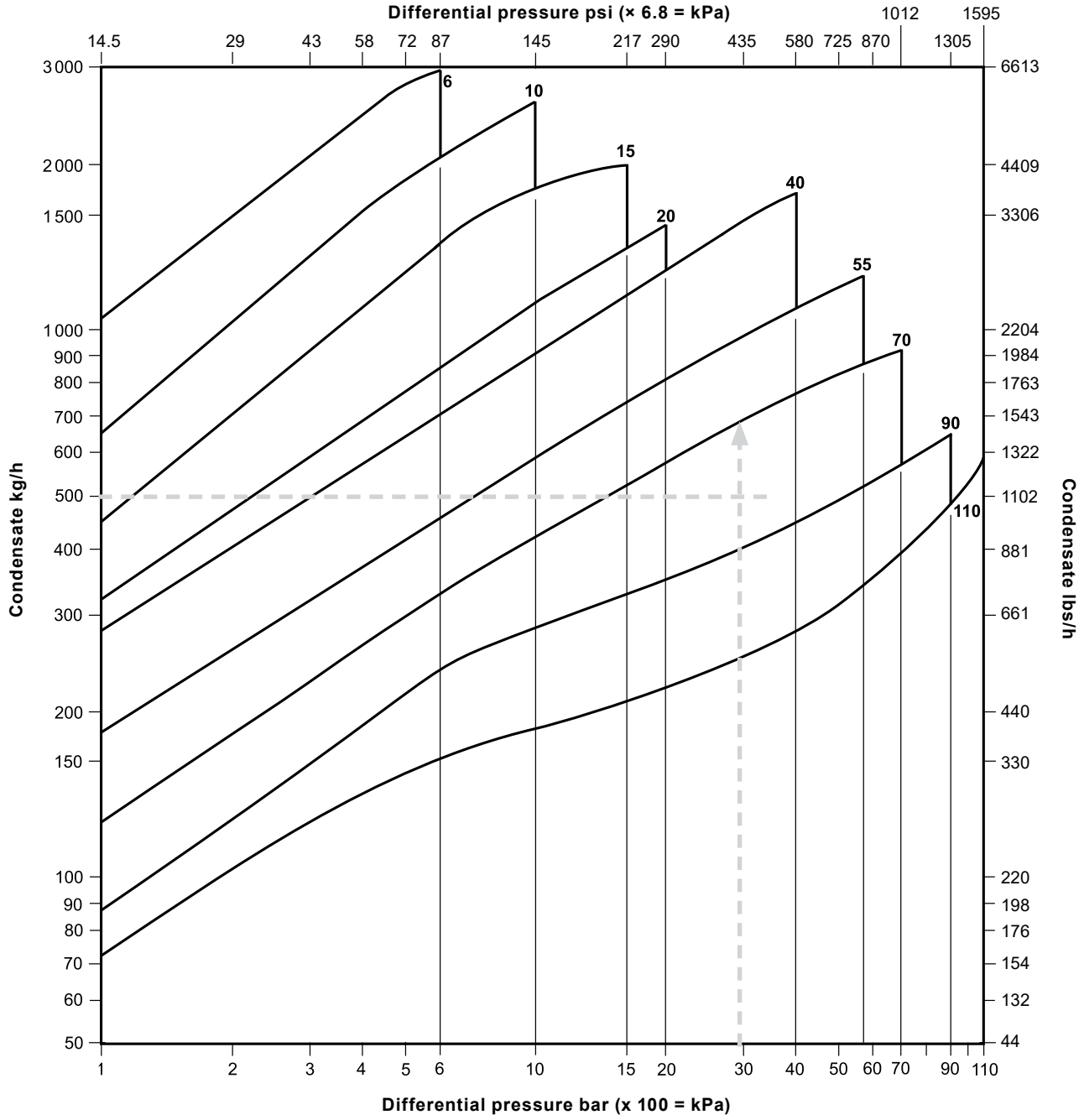
Effective differential pressure = 30 bar

Upstream pressure = 45 bar g

Backpressure = 15 bar g

The unit of choice would have a **ΔP max. differential pressure of 70 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN20

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 1050 kg/h

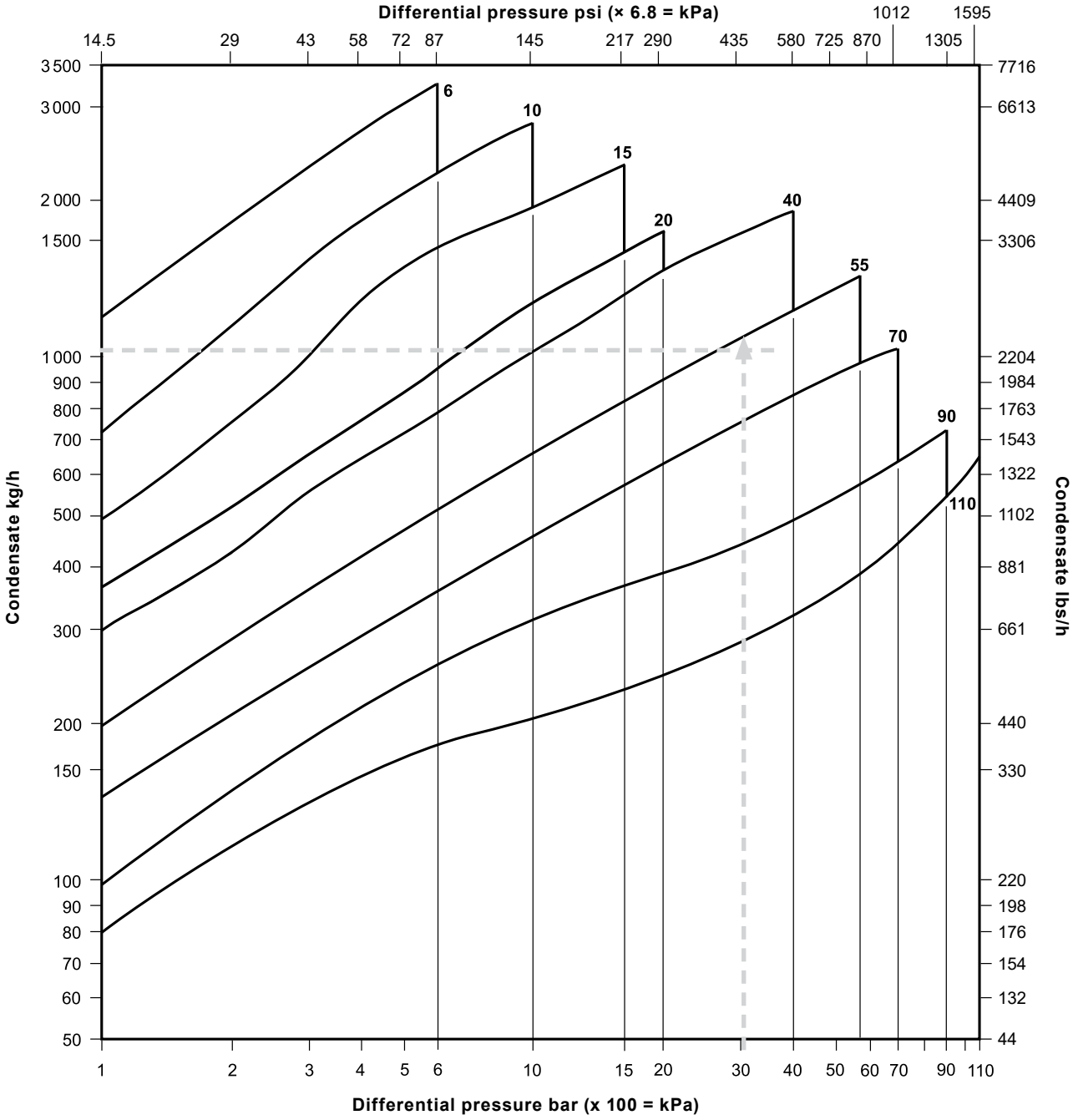
Effective differential pressure = 30 bar

Upstream pressure = 45 bar g

Backpressure = 15 bar g

The unit of choice would have a **ΔP max. differential pressure of 55 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN25

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 2000 kg/h

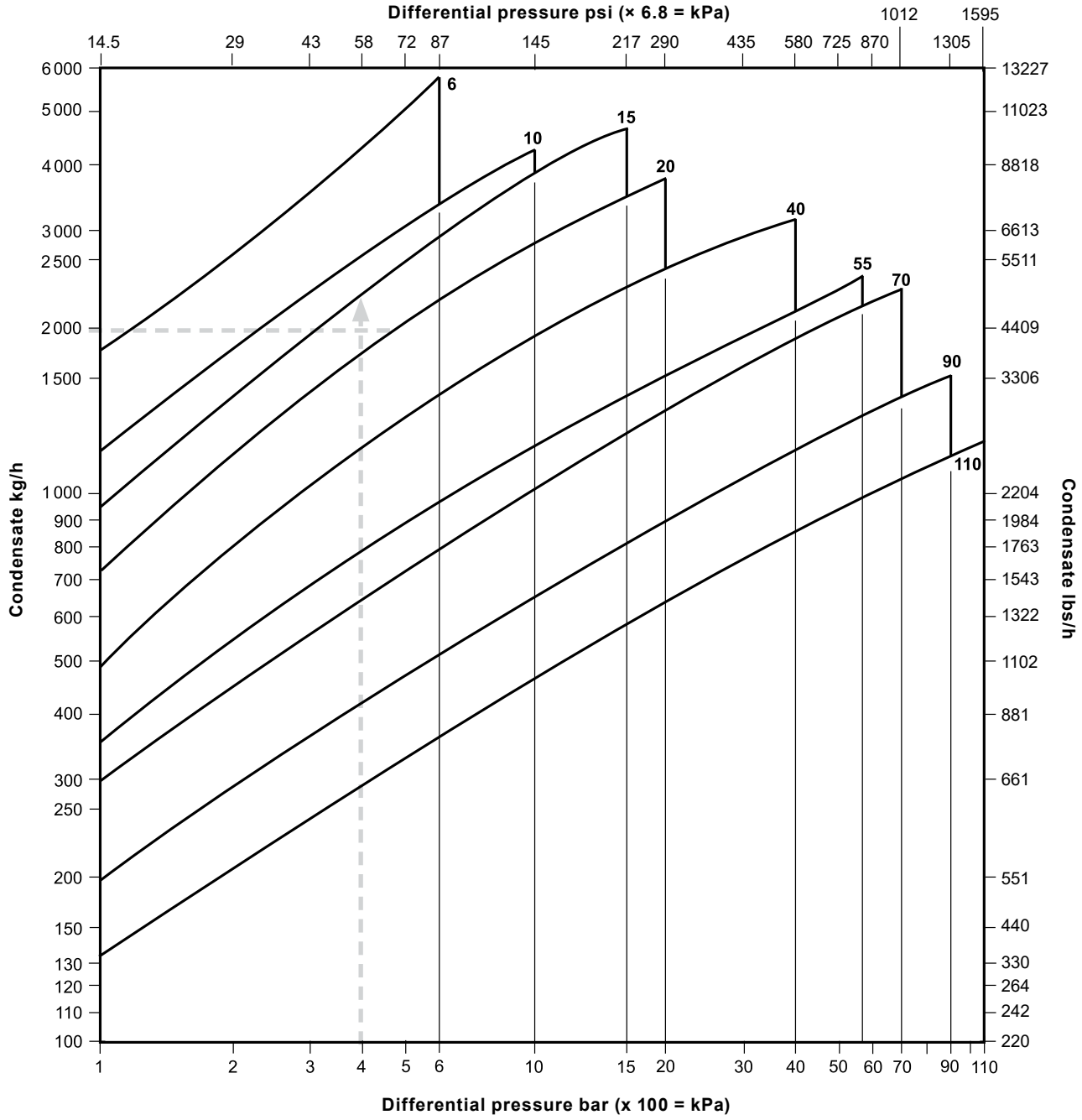
Effective differential pressure = 4 bar

Upstream pressure = 5 bar g

Backpressure = 1 bar g

The unit of choice would have a **ΔP max. differential pressure of 15 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN40

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 2000 kg/h

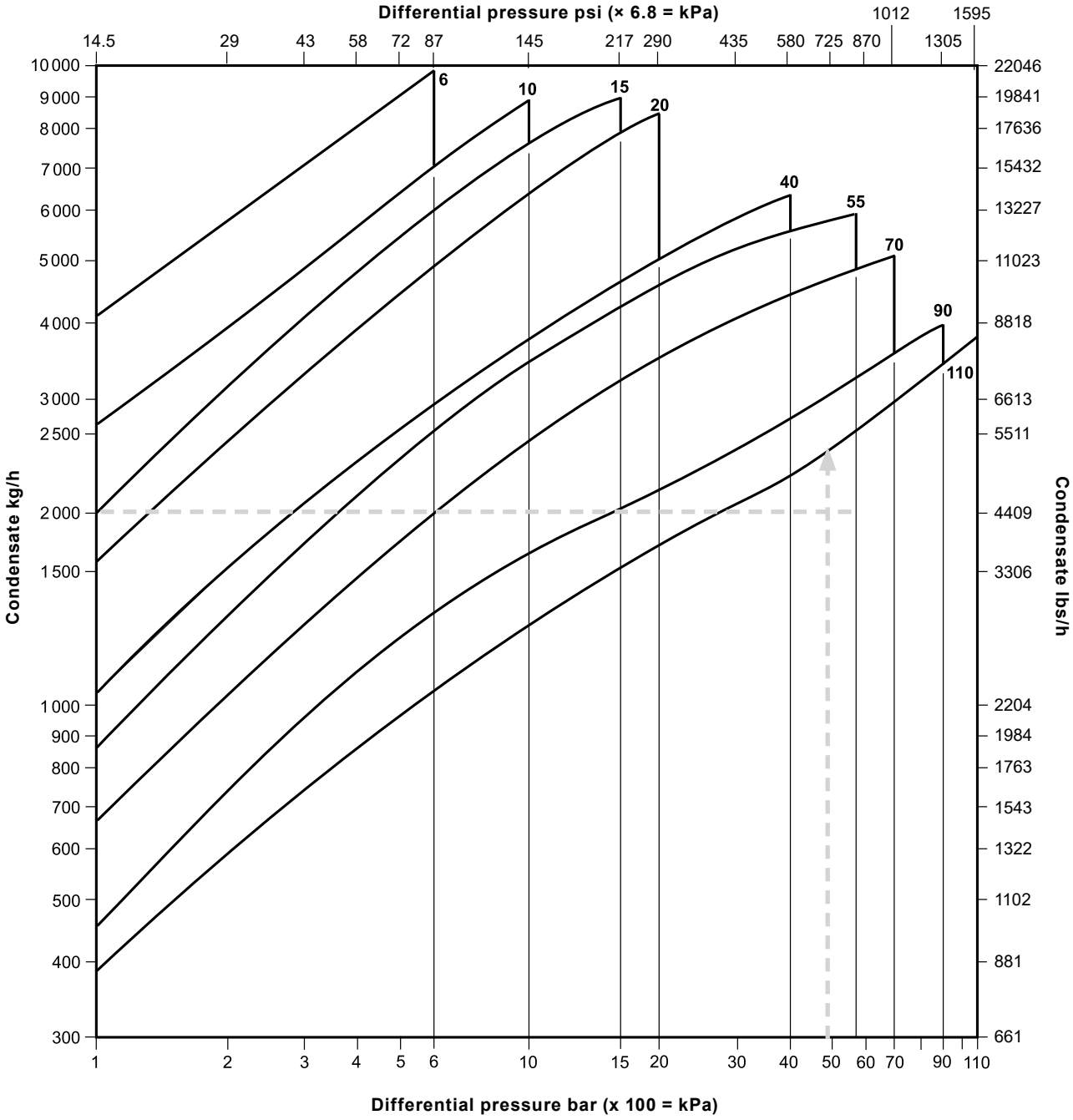
Effective differential pressure = 50 bar

Upstream pressure = 75 bar g

Backpressure = 25 bar g

The unit of choice would have a **ΔP max. differential pressure of 110 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN50

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 6000 kg/h

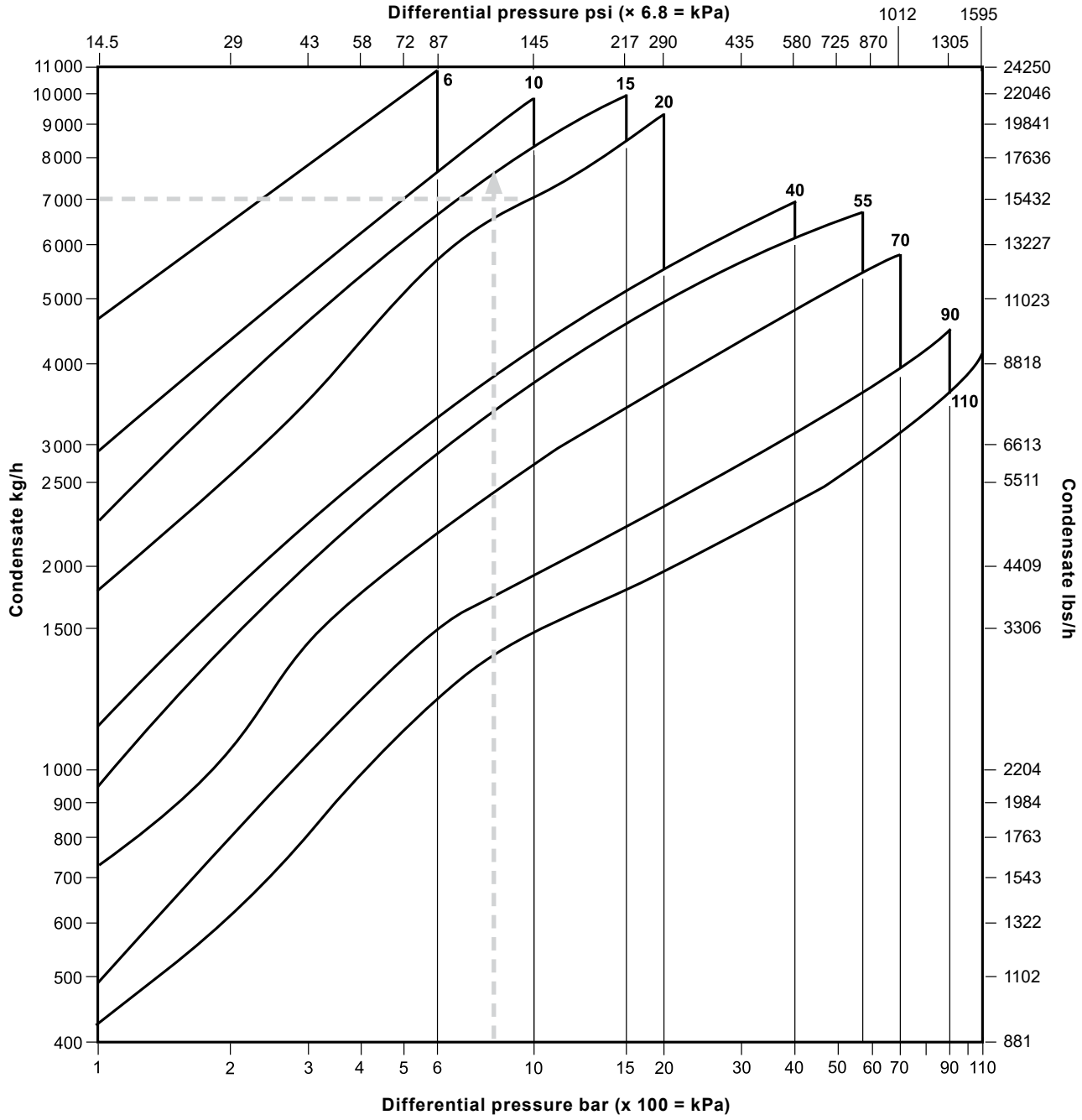
Effective differential pressure = 8 bar

Upstream pressure = 10 bar g

Backpressure = 2 bar g

The unit of choice would have a **ΔP max. differential pressure of 20 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN80

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 5000 kg/h

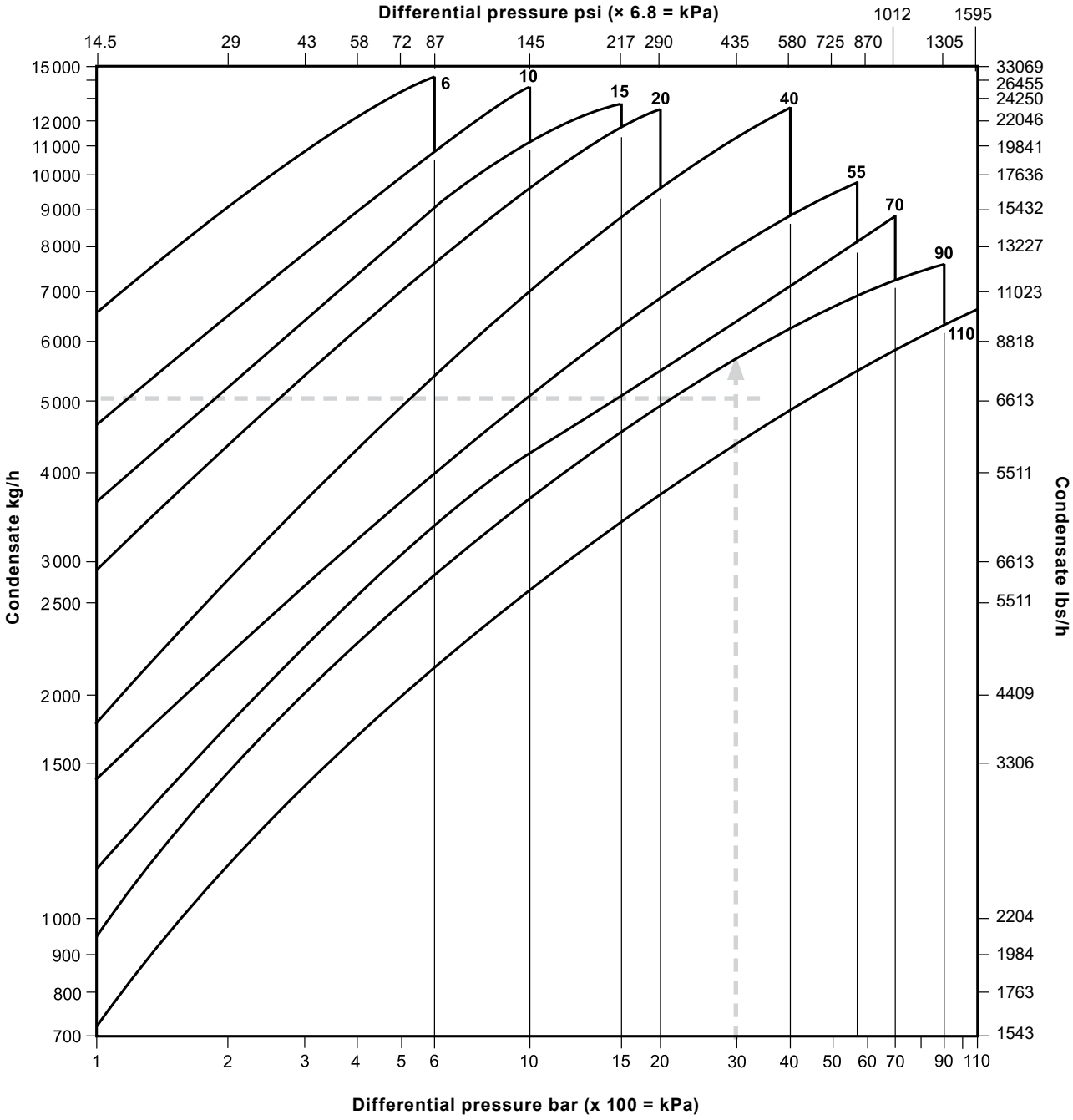
Effective differential pressure = 30 bar

Upstream pressure = 55 bar g

Backpressure = 25 bar g

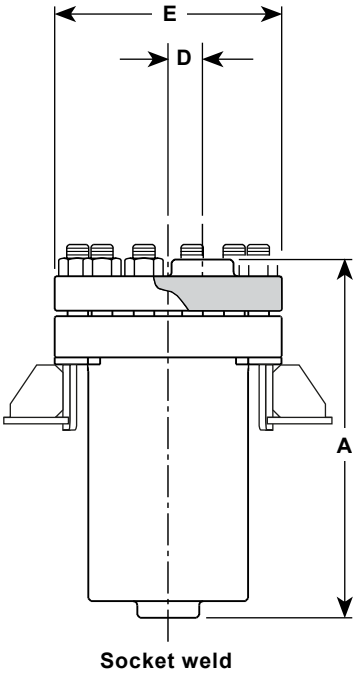
The unit of choice would have a **ΔP max. differential pressure of 90 bar** which is greater than the upstream pressure.

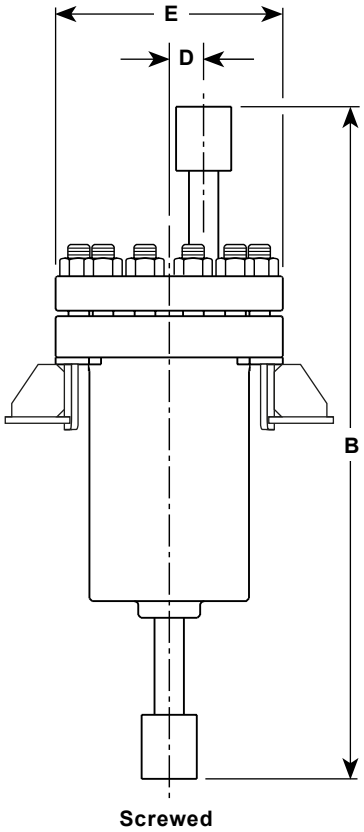
For full product selection and nomenclature follow the guide on page 13.

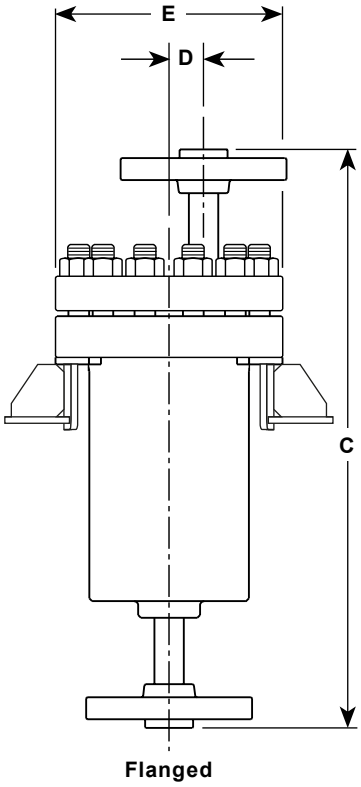


Dimensions (approximate) in mm (inches)

IBV size	A	B	C	D	E
DN15 ½"	260 (10.2)	488 (19.2)	420 (16.5)	25 (0.98)	165 (6.50)
DN20 ¾"					
DN25 1"	345 (13.6)	616 (24.3)	530 (20.9)	40 (1.57)	210 (8.27)
DN40 1½"	411 (16.2)	774 (30.5)	650 (25.6)	39 (1.54)	265 (10.4)
DN50 2"		782 (30.8)			
DN80 3"	532 (20.9)	1 026 (40.4)	850 (33.5)	36 (1.42)	305 (12.0)







Weights (approximate) in kg (lbs)

* on request

IBV size		BSP + NPT	Socket weld	Flanged ASME Class:					Flanged EN 1092:				
				150	300	600	900	1500*	PN16	PN25	PN40	PN63	PN100
DN15	½"	20 (44.1)	18 (39.7)	20 (44.1)	20 (44.1)	20 (44.1)	22 (48.5)	22 (48.5)	20 (44.1)	20 (44.1)	20 (44.1)	20 (44.1)	22 (48.5)
DN20	¾"	26 (57.3)	24 (52.9)	26 (57.3)	28 (61.7)	28 (61.7)	30 (66.1)	30 (66.1)	28 (61.7)	28 (61.7)	28 (61.7)	28 (61.7)	30 (66.1)
DN25	1"	42 (92.6)	39 (86.0)	42 (92.6)	44 (97.0)	44 (97.0)	48 (106)	48 (106)	42 (92.6)	42 (92.6)	42 (92.6)	42 (92.6)	46 (101)
DN40	1½"	68 (150)	65 (143)	70 (154)	72 (159)	72 (159)	78 (172)	78 (172)	70 (154)	70 (154)	70 (154)	70 (154)	74 (163)
DN50	2"	68 (150)	65 (143)	72 (159)	74 (163)	76 (168)	88 (194)	88 (194)	72 (159)	72 (159)	72 (159)	74 (163)	78 (172)
DN80	3"	125 (276)	120 (265)	132 (291)	136 (300)	138 (304)	152 (335)	162 (357)	130 (287)	130 (287)	130 (287)	134 (295)	138 (304)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note:

The trap must be installed below the drain point with the body upright in a vertical position, the cover at the top and the inlet connection at the bottom; this orientation will ensure that the bucket mechanism will rise and fall vertically without any friction. It is recommended that a strainer is installed upstream of the IBV to protect it from contamination.
To permit safe inspection for cleaning or maintenance purpose it is again recommended that suitable shut-off valves are installed upstream and downstream of the IBV application.
It needs to be appreciated that there is blast discharge with this device, consequently the downstream accessories, if any, should be installed at a minimum distance of 1 m (3.28 ft) from the IBV.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

IBV product nomenclature and selection guide:

Please note that other units are available on request to suit the specifics of a particular process application.

Series			C	= Carbon steel	C
PMO (PS) @ Saturated steam temperature for the body rating	**Carbon steel**	116 bar g	=	ASME Class 900 body	116
ΔP maximum differential pressure		ΔP	=	6, 10, 15, 20, 40, 55, 70, 90, 110 bar	110
Connections	**Size**		=	½", ¾", 1", 1½", 2", 3" **or** DN15, DN20, DN25, DN40, DN50, DN80	3"
	Screwed		=	BSP or NPT	ASME Class 300
	Socket weld		=	According to ASME B 16.11	
	Flanged	ASME	=	ASME Class 150, 300, 600, 900, (*1500 available on request)	
		EN 1092	=	PN16, PN25, PN40, PN63, PN100	
Optional extras		Blank	=	Standard	
		NACE	=	NACE compliancy	
		CV	=	Check valve **Please note** that this option is only available for units that have a ΔP maximum differential pressure of 40 bar and above - See above.	

IBV product selection example: IBV - C - 116 - 110 - 3" - ASME Class 300 -

How to order

1 off Spirax Sarco IBV - C - 116 - 110 - 3" - Flanged ASME Class 300 inverted bucket vertical steam trap having a carbon steel body and cover with stainless steel internals.

The following will be supplied, if specified, at the time of order placement:

1. A special name-plate when a U-STAMP has been specified.

Spare parts

The spare parts available are shown in heavy outline.
Parts drawn in a grey line are not supplied as spares.

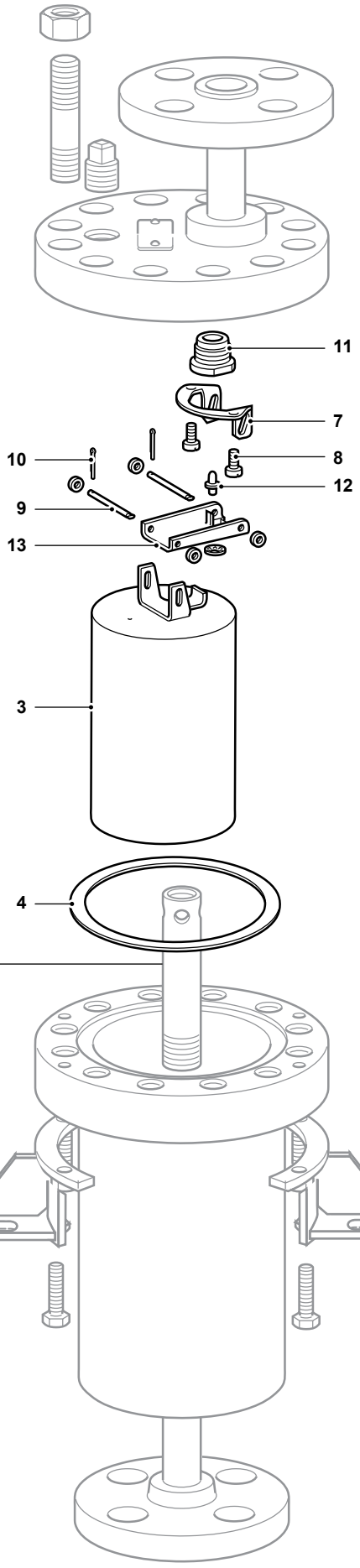
Available spares

Valve assembly	**4**, **7**, **8**, **9**, **10**, **11**, **12**, **13**
Bucket assembly	**4**, **6**, **9**, **10**
Cover gasket (packet of 3)	**4**

How to order spares

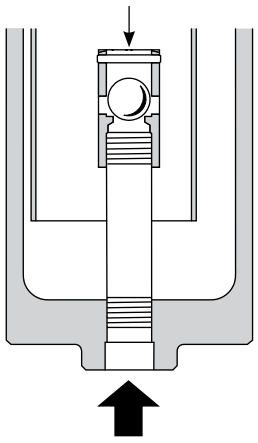
Always order spares by using the description given in the column headed 'Available spares' and state the type of trap, pressure rating and size and type of the connections.

Example: 1 - Valve assembly for a Spirax Sarco IBV - C - 116 - 110 - 3" - Flanged ASME Class 300 inverted bucket vertical steam trap.



Optional extra

Inbuilt stainless steel check valve



Please note that this option is only available for units that have a DP maximum differential pressure of 40 bar and above -
See the IBV product nomenclature and selection guide on page 13 for clarification.

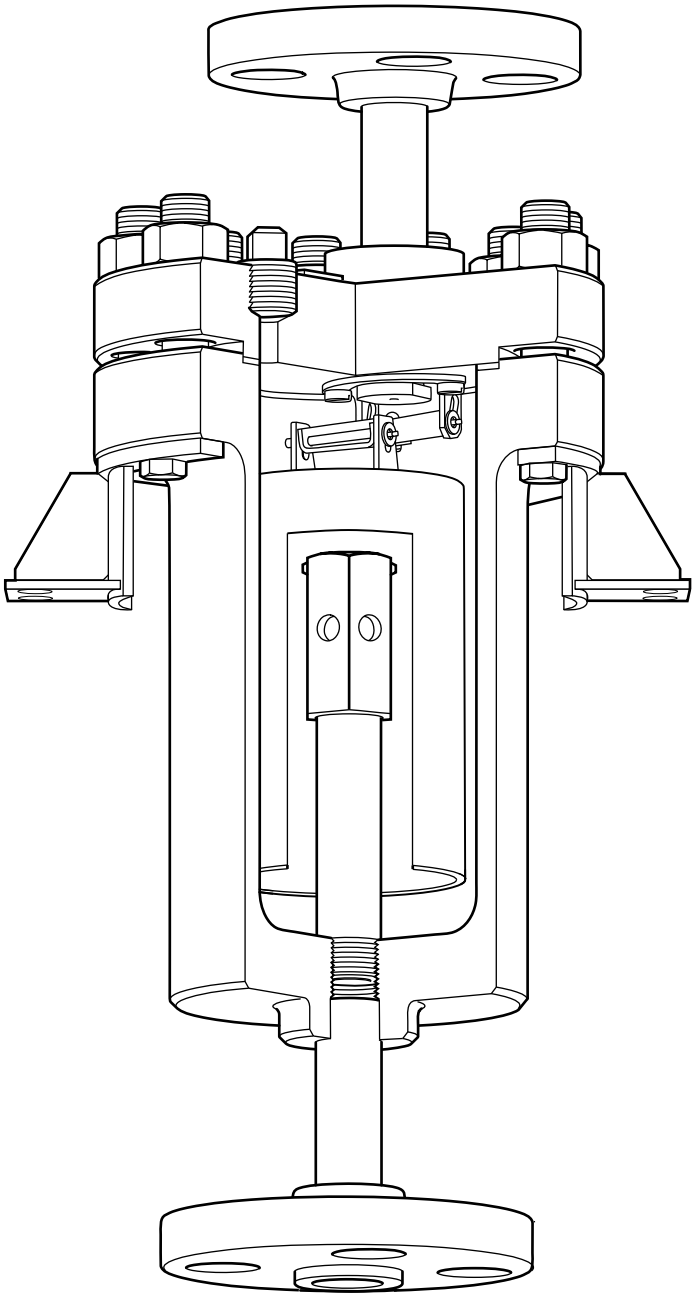
TI-P067-13
CMGT Issue 4

IBV Series C-LF2
Carbon Steel
Inverted Bucket Vertical Steam Trap

Description

The IBV series C-LF2 inverted bucket steam trap is manufactured using carbon steel (A350 LF2) for the body and cover; with internal components being made of stainless steel. It is suitable for use with saturated and superheated steam and in high pressure and high temperature applications. The IBV is fully automatic and has been designed in such a way that there is minimal friction from mechanism movement; valve closure is immediate, without any steam loss and the discharge action is positive with no equivocal phases. The standard version will be supplied with bolted support brackets.

On the cover of the IBV there in a ⅜" hole, threaded and plugged, to eliminate any water discharge after being hydraulically tested before leaving the factory. This hole can be reopened on site for the customer to perform periodic hydro testing.



Standards

This steam trap is designed following the ASME VIII Mechanical Design Code and complies with the requirements of the Pressure Equipment Directive and carries the CE mark when so required.

Certification

The product is available with material certification to EN 10204 3.1.

Note: All certification/inspection requirements must be stated at the time of order placement.

Optional extras

On request the IBV steam trap can be equipped with the following:

An **inbuilt stainless steel check valve**
Please note that this option is only available for units that have a ΔP maximum differential pressure of 40 bar (580 psi) and above - See the IBV product nomenclature and selection guide for clarification.

A **Stellite plug and seat**.

Available types

Series C	**Carbon steel** body and cover	**See** TI-P067-10
Series C-LF2	**Carbon steel** body and cover with a material specification of **A350 LF2** for low temperature applications down to -46 °C (-51 °F)	
Series Z	**Alloy steel** body and cover	**See** TI-P067-15

Sizes and pipe connections

Please note that all standard flanges (as noted below) will be slip-on type. Weld-neck type flanges can be supplied to special order and must be specified at the time of order placement.

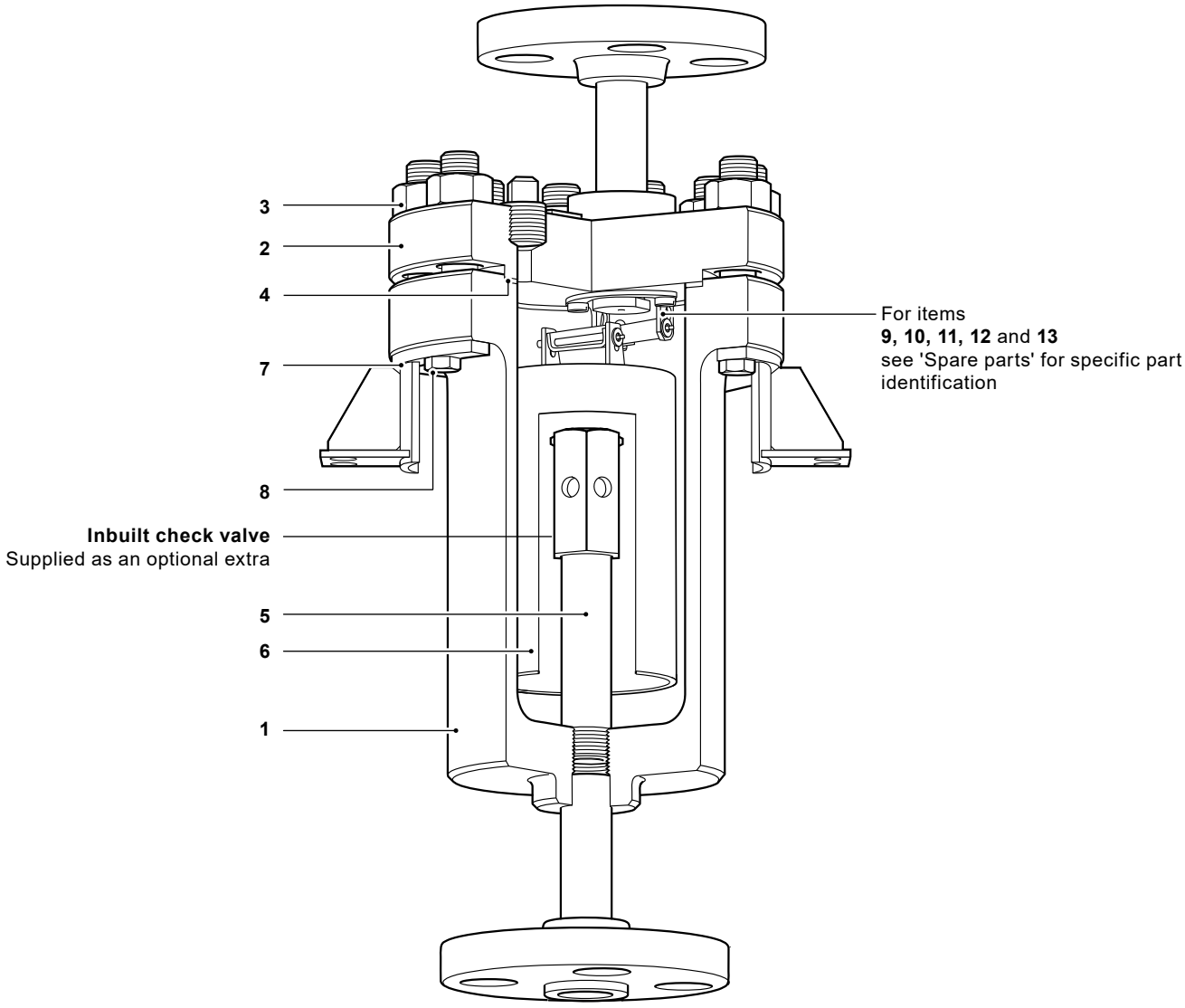
½", ¾", 1", 1½", 2" and 3"
Screwed BSP or NPT
Socket weld, according to ASME B 16.11

½", ¾", 1", 1½", 2" and 3"
Flanged ASME B 16.5 ASME Class 150, 300, 600 and 900 (1500 available to special request Series C only)

DN15, DN20, DN25, DN40, DN50 and DN80
Flanged EN 1092 PN16, PN25, PN40, PN63 and PN100

Note: that the flanged **ASME Class 1500** units are **limited to a body rating of ASME** Class 900.

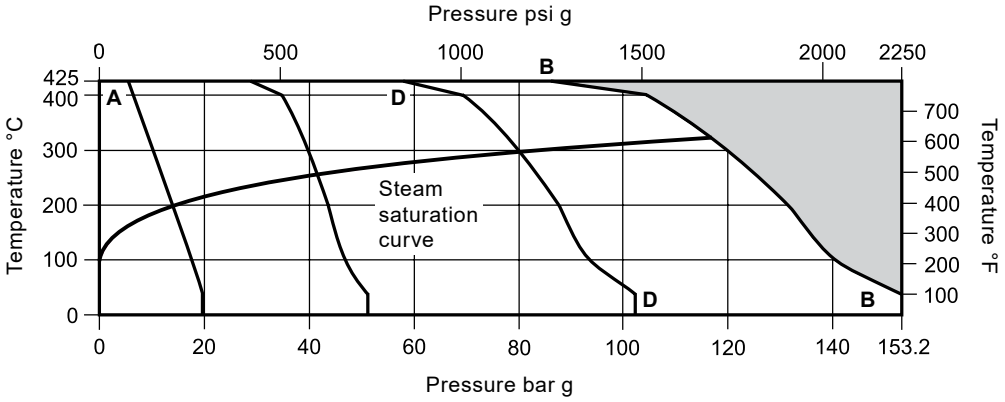
Materials



No.	Part	Material	
1	Body	Carbon steel	PED ASTM A350 LF2 CL. 1
2	Cover	Carbon steel	ASTM A350 LF2
3	Stud bolts		ASTM A193 Gr. B8 CL.2
	Nuts		ASTM A194 Gr. 8
	NACE Version	(External only)	
		Stud bolts	ASTM A479XM-19
		Nuts	ASTM A194 Gr. 8M
4	Cover gasket	Reinforced graphite	
5	Channelling pipe	Stainless steel	A333 Gr. 6

No.	Part	Material	
6	Bucket	Stainless steel	AISI 316
7	Bracket	Carbon steel	A516 Gr. 70
8	Bracket screw	Stainless steel	AISI 316
9	Lever pin	Stainless steel	AISI 316
10	Split pin	Stainless steel	AISI 316
11	Valve seat	Stainless steel	400 series
12	Valve head	Stainless steel	400 series
13	Valve lever	Stainless steel	AISI 316

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged ASME

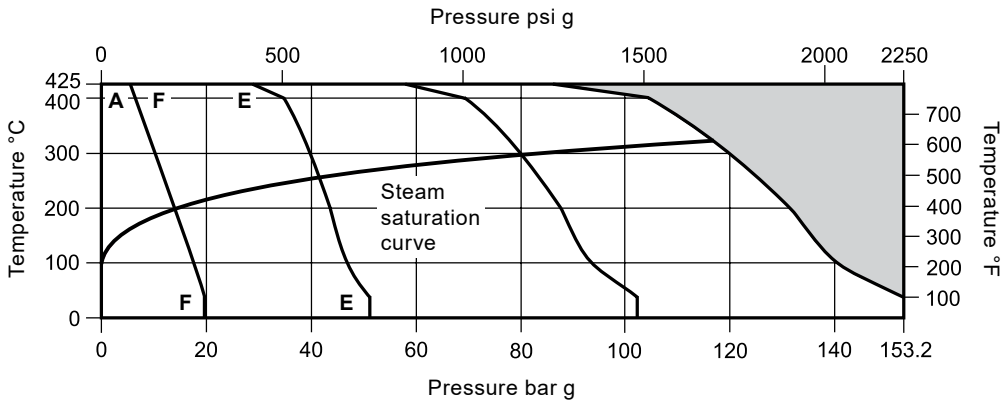


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

		Body design conditions		ASME Class 900
A-B-B	Screwed and Socket weld ASME Class 900	PMA - Maximum allowable pressure	153.2 bar g @ 38 °C	2 222 psi g @ 100 °F
		TMA - Maximum allowable temperature	425 bar g @ 86.3 °C	800 °F @ 1 235 psi g
		Minimum allowable temperature	-46 °C	-50 °F
		* PMO (PS) - Maximum operating pressure for saturated steam service	116.3 bar g	1 687 psi g
		TMO (TS) - Maximum operating temperature for saturated steam service	323 °C @ 112.7 bar g	613 °F @ 1 635 psi g
		Designed for a maximum cold hydraulic test pressure of:	229.8 bar g	3 330 psi g
A-D-D	ASME Class 600	PMA - Maximum allowable pressure	102.1 bar g @ 38 °C	1 480 psi g @ 100 °F
		TMA - Maximum allowable temperature	425 °C @ 57.5 bar g	800 °F @ 825 psi g
		Minimum allowable temperature	-46 °C	-50 °F
		* PMO (PS) - Maximum operating pressure for saturated steam service	79.9 bar g	1 159 psi g
		TMO (TS) - Maximum operating temperature for saturated steam service	295 °C @ 75.1 bar g	564 °F @ 1 089 psi g
		Designed for a maximum cold hydraulic test pressure of:	153.1 bar g	2 220 psi g

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged ASME (continued)

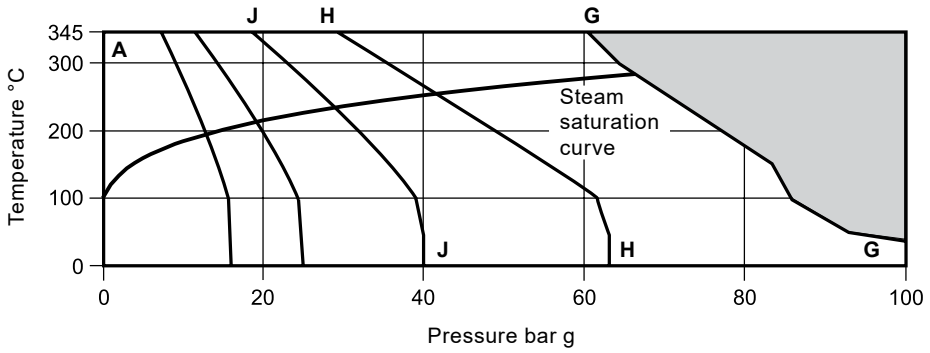


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

A-E-E	**ASME Class 300**	PMA - Maximum allowable pressure	51.1 bar g @ 38 °C	741 psi g @ 100 °F
		TMA - Maximum allowable temperature	425 °C @ 28.8 bar g	800 °F @ 410 psi g
		Minimum allowable temperature	-46 °C	-50 °F
		* PMO (PS) - Maximum operating pressure for saturated steam service	41.7 bar g	605 psi g
		TMO (TS) - Maximum operating temperature for saturated steam service	254 °C @ 37.6 bar g	489 °F @ 545 psi g
		Designed for a maximum cold hydraulic test pressure of:	76.6 bar g	1 110 psi g
A-F-F	**ASME Class 150**	PMA - Maximum allowable pressure	19.6 bar g @ 38 °C	284 psi g @ 100 °F
		TMA - Maximum allowable temperature	425 °C @ 5.5 bar g	800 °F @ 80 psi g
		Minimum allowable temperature	-46 °C	-50 °F
		* PMO (PS) - Maximum operating pressure for saturated steam service	14 bar g	203 psi g
		TMO (TS) - Maximum operating temperature for saturated steam service	197 °C @ 8.4 bar g	387 °F @ 122 psi g
		Designed for a maximum cold hydraulic test pressure of:	29.4 bar g	427 psi g

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged EN1092-1

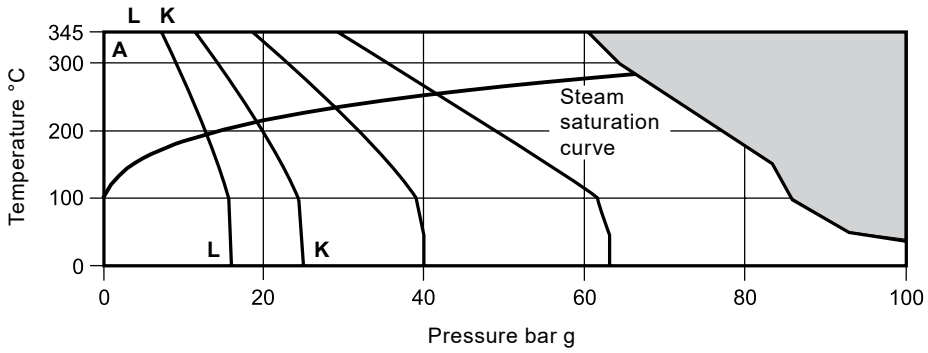


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

*** Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

		Body design conditions	PN100
A-G-G	PN100	PMA - Maximum allowable pressure	100 bar g @ 50 °C
		TMA - Maximum allowable temperature	425 °C @ 44.9 bar g
		Minimum allowable temperature	-46 °C
		* PMO (PS) - Maximum operating pressure for saturated steam service	66 bar g
		TMO (TS) - Maximum operating temperature for saturated steam service	283 °C @ 60.4 bar g
		Designed for a maximum cold hydraulic test pressure of:	143 bar g
A-H-H	PN63	PMA - Maximum allowable pressure	63 bar g @ 50 °C
		TMA - Maximum allowable temperature	425 °C @ 28.3 bar g
		Minimum allowable temperature	-46 °C
		* PMO (PS) - Maximum operating pressure for saturated steam service	44 bar g
		TMO (TS) - Maximum operating temperature for saturated steam service	257 °C @ 29.4 bar g
		Designed for a maximum cold hydraulic test pressure of:	90 bar g
A-J-J	PN40	PMA - Maximum allowable pressure	40 bar g @ 50 °C
		TMA - Maximum allowable temperature	425 °C @ 17.9 bar g
		Minimum allowable temperature	-46 °C
		* PMO (PS) - Maximum operating pressure for saturated steam service	29 bar g
		TMO (TS) - Maximum operating temperature for saturated steam service	234 °C @ 18.6 bar g
		Designed for a maximum cold hydraulic test pressure of:	57.2 bar g

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged EN1092-1 (continued)



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

*** Please note** that the PMO (PS) is limited to the maximum ΔP of the selected IBV.

A-K-K	**PN25**	PMA - Maximum allowable pressure	25 bar g @ 50 °C
		TMA - Maximum allowable temperature	425 °C @ 11.2 bar g
		Minimum allowable temperature	-46 °C
		* PMO (PS) - Maximum operating pressure for saturated steam service	19 bar g
		TMO (TS) - Maximum operating temperature for saturated steam service	212 °C @ 11.6 bar g
		Designed for a maximum cold hydraulic test pressure of:	35.7 bar g
A-L-L	**PN16**	PMA - Maximum allowable pressure	16 bar g @ 50 °C
		TMA - Maximum allowable temperature	425 °C @ 7.1 bar g
		Minimum allowable temperature	-46 °C
		* PMO (PS) - Maximum operating pressure for saturated steam service	12 bar g
		TMO (TS) - Maximum operating temperature for saturated steam service	191 °C @ 7.4 bar g
		Designed for a maximum cold hydraulic test pressure of:	22.8 bar g

Capacities - DN15 (½")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 500 kg/h

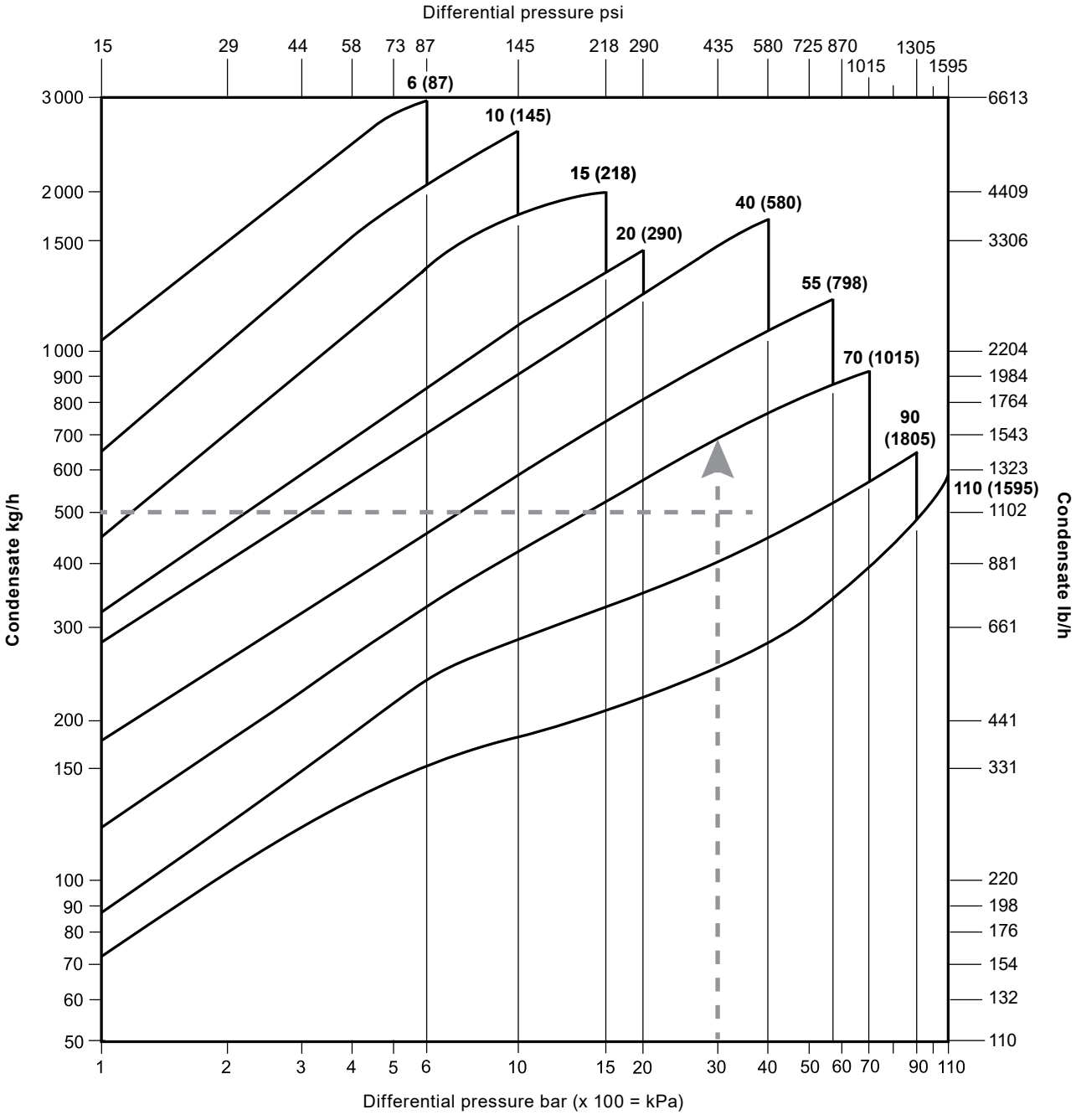
Effective differential pressure = 30 bar

Upstream pressure = 45 bar g

Backpressure = 15 bar g

The unit of choice would have a **ΔP max. differential pressure of 70 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN20 (¾")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 1050 kg/h

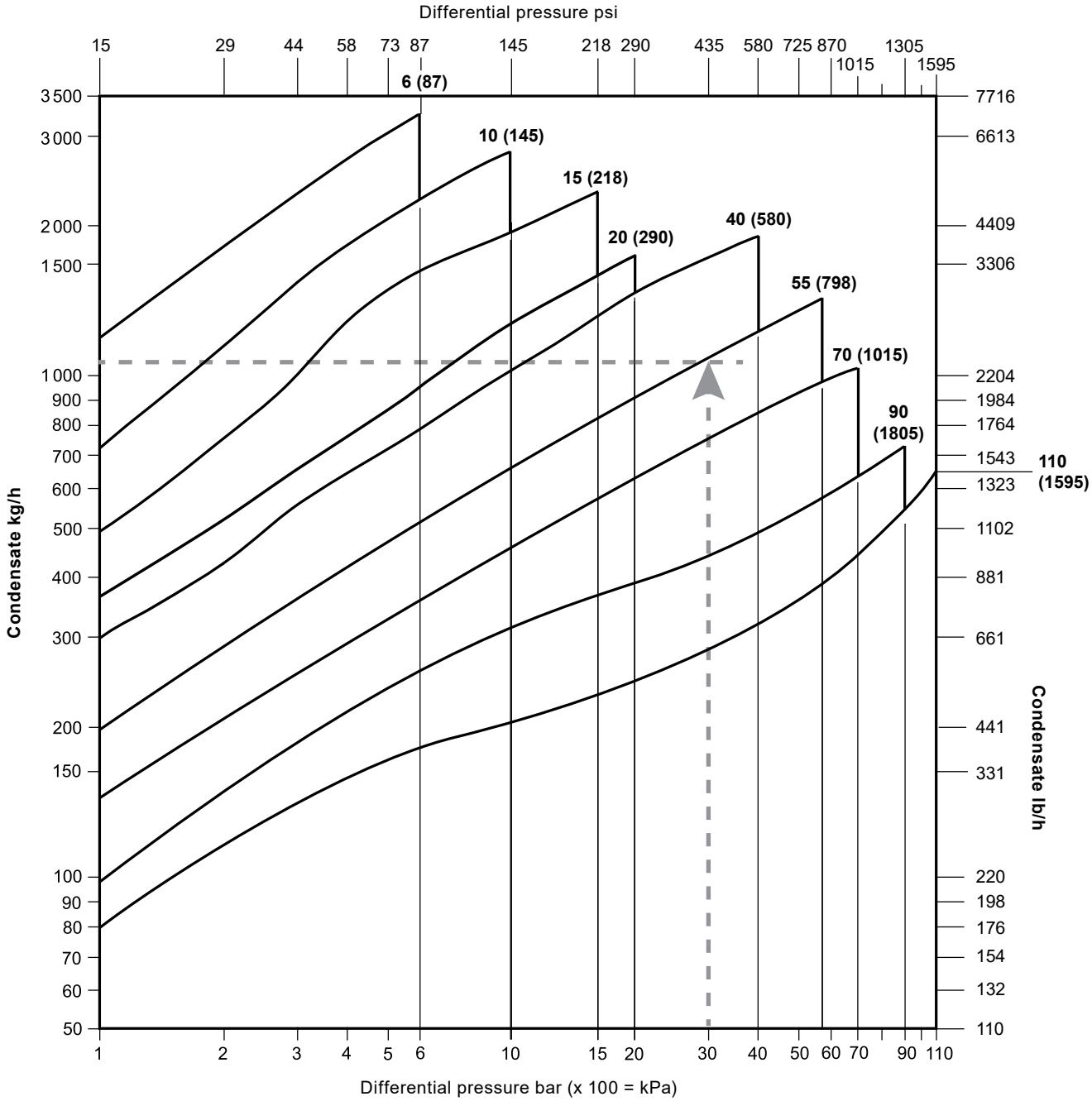
Effective differential pressure = 30 bar

Upstream pressure = 45 bar g

Backpressure = 15 bar g

The unit of choice would have a **ΔP max. differential pressure of 55 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN25 (1")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 2000 kg/h

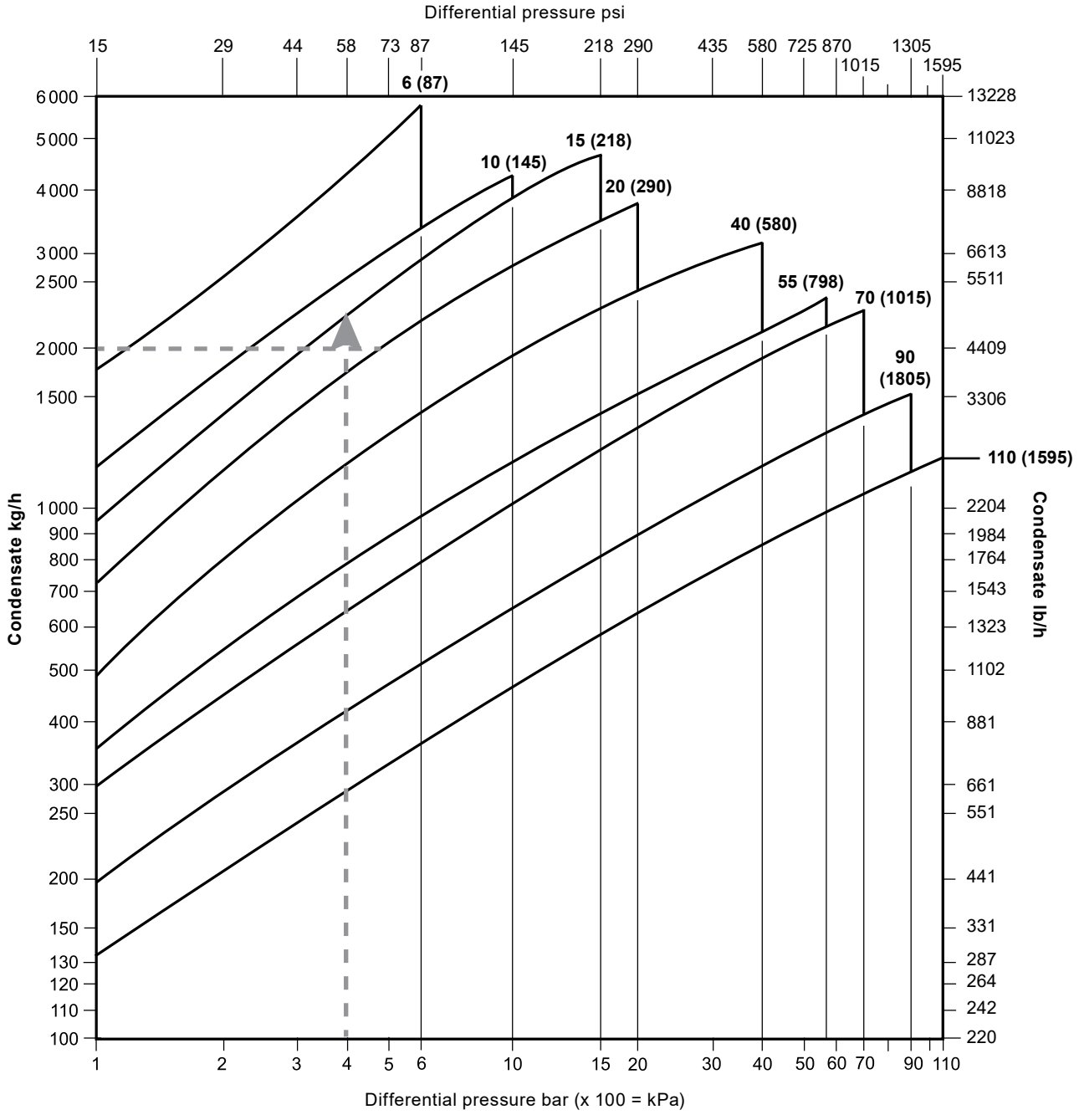
Effective differential pressure = 4 bar

Upstream pressure = 5 bar g

Backpressure = 1 bar g

The unit of choice would have a **ΔP max. differential pressure of 15 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN40 (1½")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 2000 kg/h

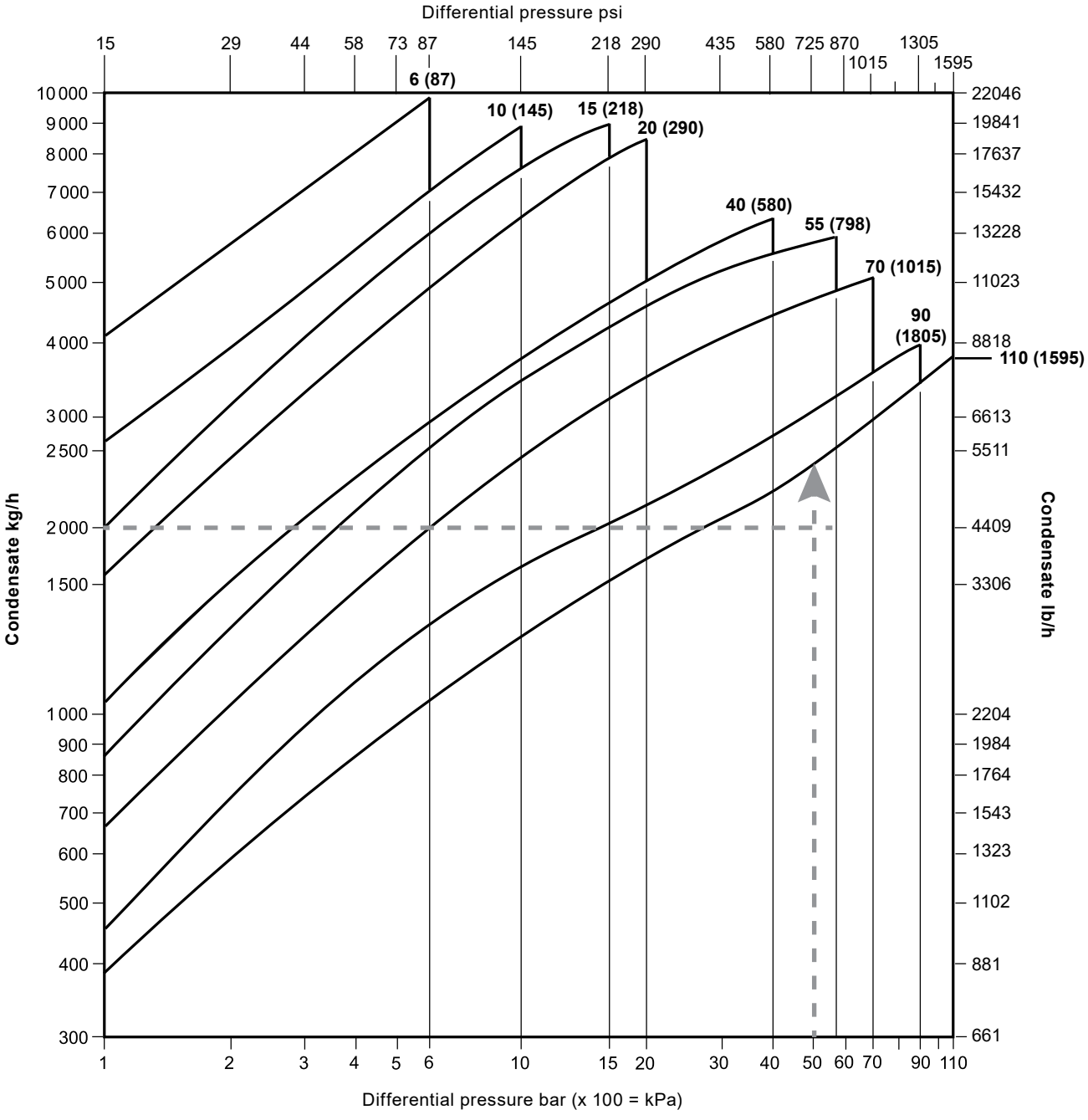
Effective differential pressure = 50 bar

Upstream pressure = 75 bar g

Backpressure = 25 bar g

The unit of choice would have a **ΔP max. differential pressure of 110 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN50 (2")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 6000 kg/h

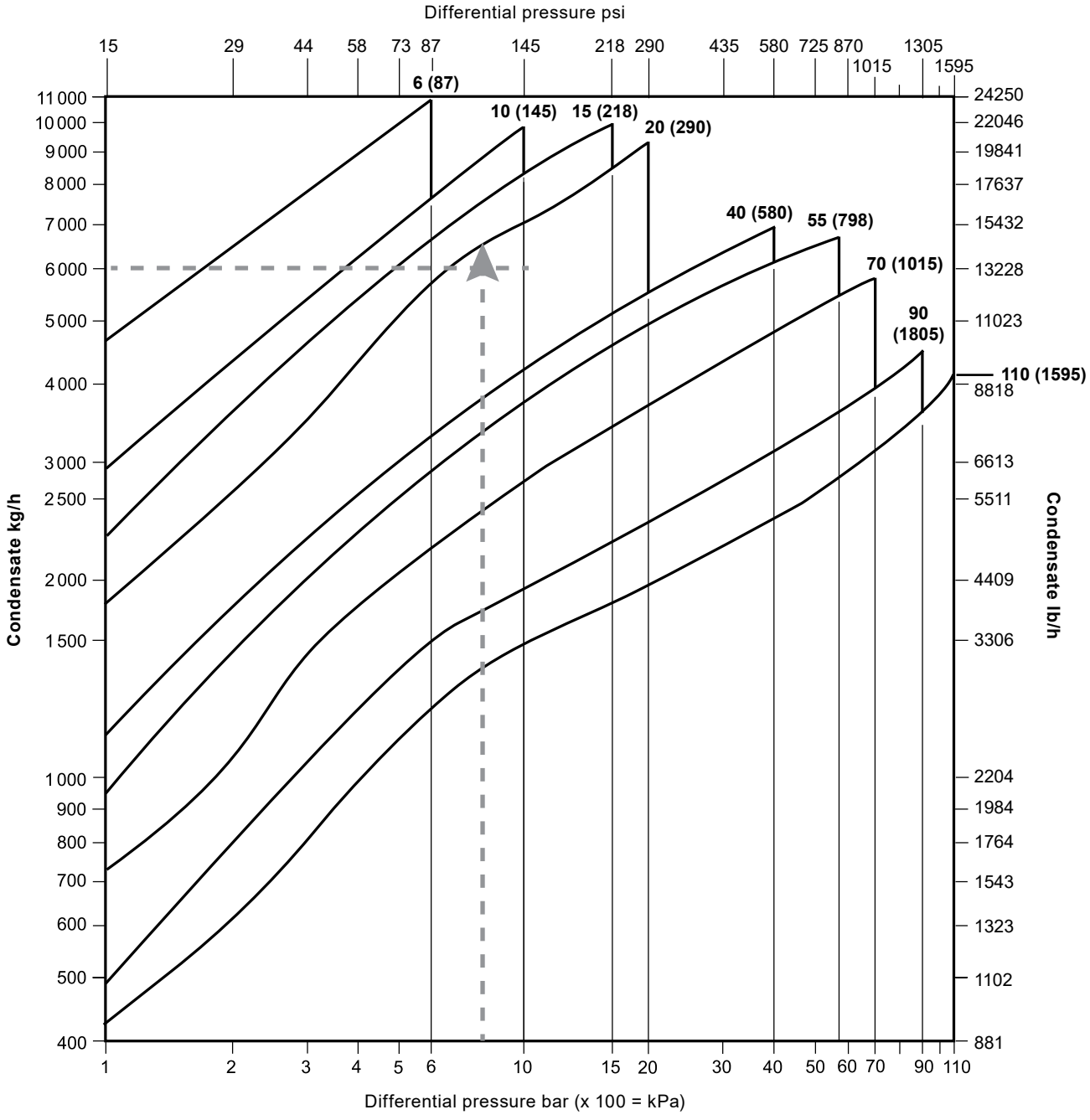
Effective differential pressure = 8 bar

Upstream pressure = 10 bar g

Backpressure = 2 bar g

The unit of choice would have a **ΔP max. differential pressure of 20 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN80 (3")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO (PS) of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 5000 kg/h

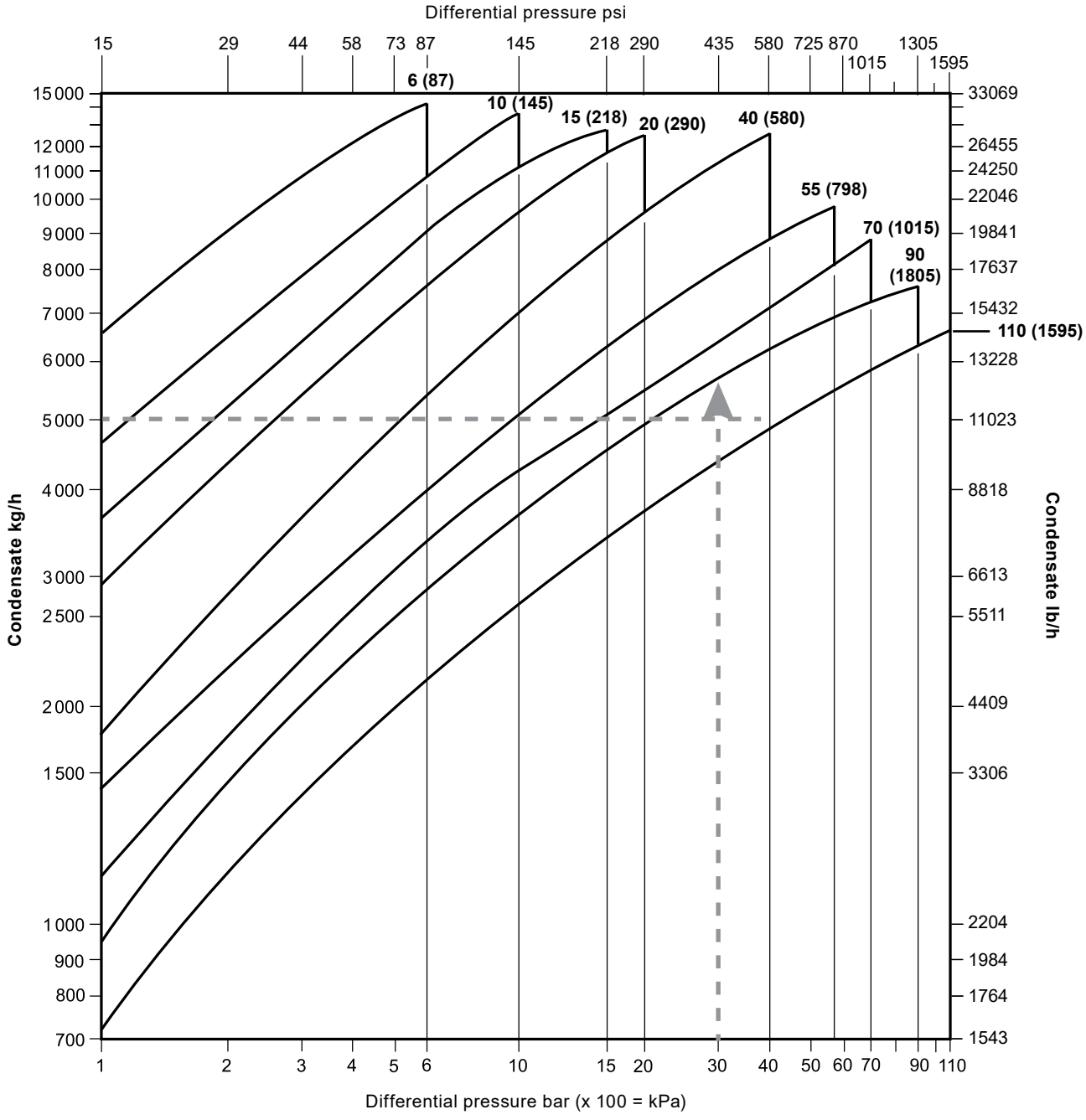
Effective differential pressure = 30 bar

Upstream pressure = 55 bar g

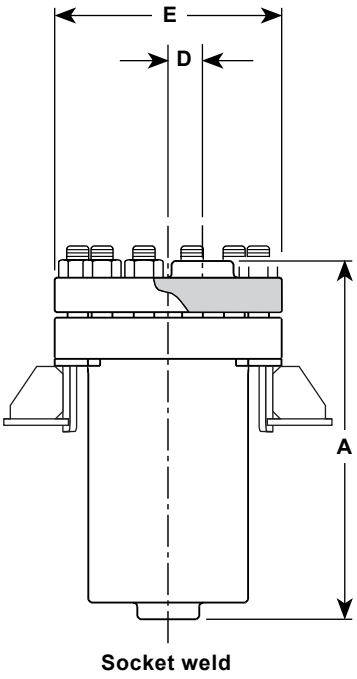
Backpressure = 25 bar g

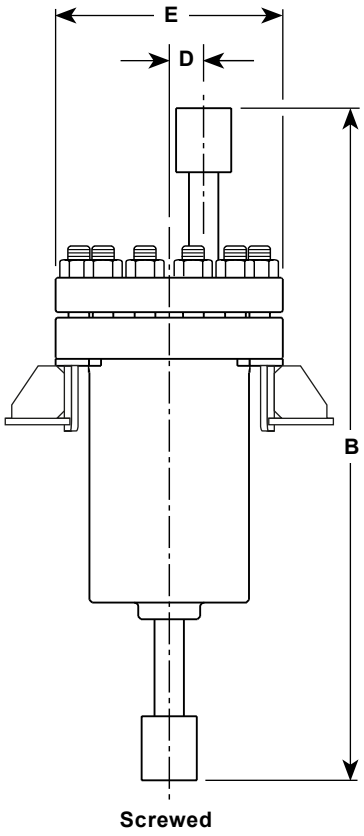
The unit of choice would have a **ΔP max. differential pressure of 90 bar** which is greater than the upstream pressure.

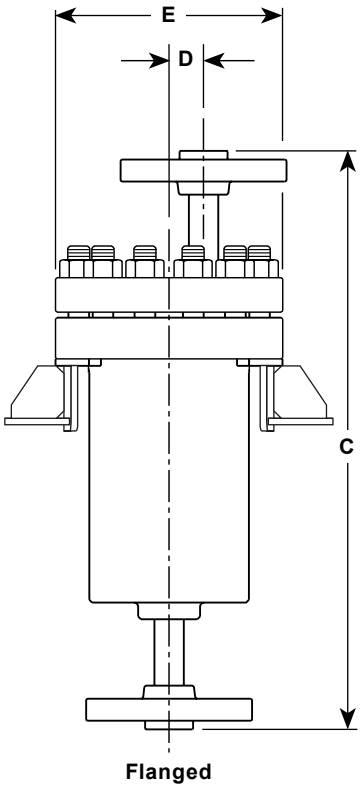
For full product selection and nomenclature follow the guide on page 13.



Dimensions (approximate) in mm (in)







IBV size		A	B	C	D	E
DN15	½"	260 (10.2)	488 (19.2)	420 (16.5)	25 (1)	165 (6.5)
DN20	¾"					
DN25	1"	345 (13.6)	616 (24.3)	530 (20.9)	40 (1.6)	210 (8.3)
DN40	1½"	411 (16.2)	774 (30.5)	650 (25.6)	39 (1.5)	265 (10.4)
DN50	2"		782 (30.8)			
DN80	3"	532 (20.9)	1 026 (40.4)	850 (33.5)	36 (1.4)	305 (12)

Weights (approximate) in kg (lb)

IBV size		BSP + NPT	Socket weld	Flanged ASME Class:					Flanged EN 1092:				
				150	300	600	900	1500*	PN16	PN25	PN40	PN63	PN100
DN15	½"	20 (44)	18 (40)	20 (44)	20 (44)	20 (44)	22 (49)	22 (49)	20 (44)	20 (44)	20 (44)	20 (44)	22 (49)
DN20	¾"	26 (57)	24 (53)	26 (57)	28 (62)	28 (62)	30 (66)	30 (66)	28 (62)	28 (62)	28 (62)	28 (62)	30 (66)
DN25	1"	42 (93)	39 (86)	42 (93)	44 (97)	44 (97)	48 (106)	48 (106)	42 (93)	42 (93)	42 (93)	42 (93)	46 (101)
DN40	1½"	68 (150)	65 (143)	70 (154)	72 (159)	72 (159)	78 (172)	78 (172)	70 (154)	70 (154)	70 (154)	70 (154)	74 (163)
DN50	2"	68 (150)	65 (143)	72 (159)	74 (163)	76 (168)	88 (194)	88 (194)	72 (159)	72 (159)	72 (159)	74 (159)	78 (172)
DN80	3"	125 (276)	120 (265)	132 (291)	136 (300)	138 (304)	152 (335)	162 (357)	130 (287)	130 (287)	130 (287)	134 (295)	138 (304)

* on request

IBV product nomenclature and selection guide:

Please note that other units are available on request to suit the specifics of a particular process application.

Series			C-LF2	= Carbon steel	C
PMO (PS) @ Saturated steam temperature for the body rating	**Carbon steel**		116 bar g	= ASME Class 900 body	116
ΔP maximum differential pressure			ΔP	= 6, 10, 15, 20, 40, 55, 70, 90, 110 bar	110
Connections	**Size**			= ½", ¾", 1", 1½", 2", 3" **or** DN15, DN20, DN25, DN40, DN50, DN80	3"
	Screwed			= BSP or NPT	ASME Class 300
	Socket weld			= According to ASME B 16.11	
	Flanged		ASME	= ASME Class 150, 300, 600, 900, (*1500 available on request)	
			EN 1092	= PN16, PN25, PN40, PN63, PN100	
Optional extras			Blank	= Standard	
			NACE	= NACE compliancy	
			CV	= Check valve **Please note** that this option is only available for units that have a ΔP maximum differential pressure of 40 bar and above - See above.	

IBV product selection example: IBV - C-LF2 - 116 - 110 - 3" - ASME Class 300 -

How to order

1 off Spirax Sarco IBV-C-LF2-116-110-3"-Flanged ASME Class 300 inverted bucket vertical steam trap having a carbon steel body and cover with stainless steel internals.

The following will be supplied, if specified, at the time of order placement:

1. A special name-plate when a U-STAMP has been specified.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note

The trap must be installed below the drain point with the body upright in a vertical position, the cover at the top and the inlet connection at the bottom; this orientation will ensure that the bucket mechanism will rise and fall vertically without any friction. It is recommended that a strainer is installed upstream of the IBV to protect it from contamination.
To permit safe inspection for cleaning or maintenance purpose it is again recommended that suitable shut-off valves are installed upstream and downstream of the IBV application.
It needs to be appreciated that there is blast discharge with this device, consequently the downstream accessories, if any, should be installed at a minimum distance of 1 m from the IBV.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

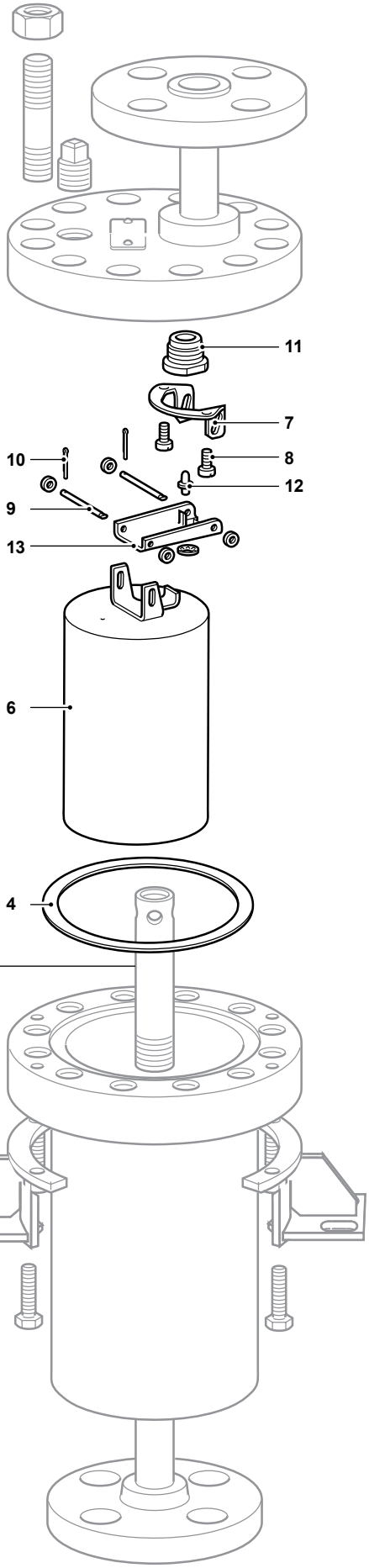
Available spares

Valve assembly		**4**, **7**, **8**, **9**, **10**, **11**, **12**, **13**
Bucket assembly		**4**, **6**, **9**, **10**
Cover gasket	(packet of 3)	**4**

How to order spares

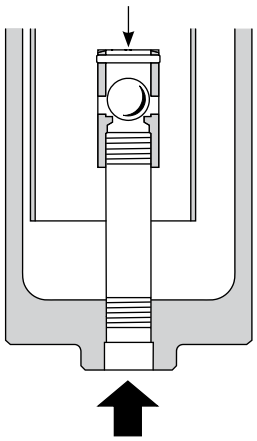
Always order spares by using the description given in the column headed 'Available spares' and state the type of trap, pressure rating and size and type of the connections.

Example:
1 - Valve assembly for a Spirax Sarco IBV - C-LF2 - 116 - 110 - 3" - Flanged ASME Class 300 inverted bucket vertical steam trap.



Optional extra

Inbuilt stainless steel check valve



Please note that this option is only available for units that have a DP maximum differential pressure of 40 bar (580 psi) and above -
See the IBV product nomenclature and selection guide on page 15 for clarification.

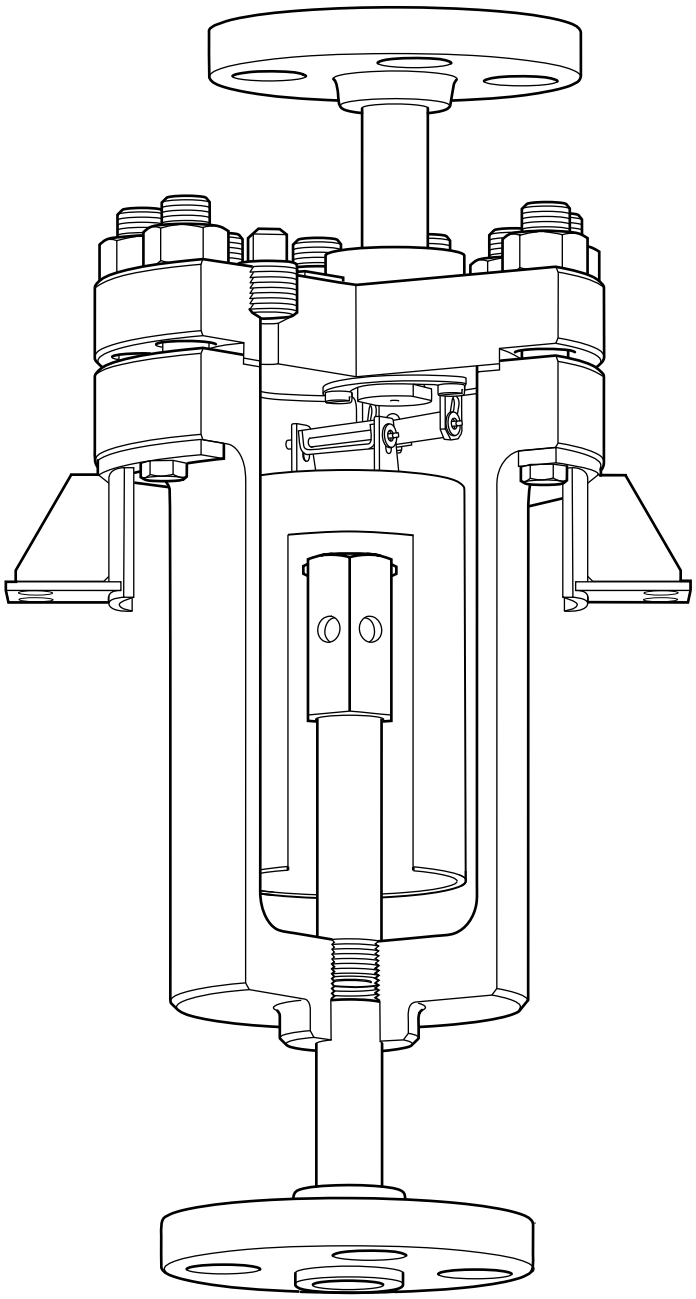
TI-P067-15
CMGT Issue 5

IBV Series Z
Alloy Steel
Inverted Bucket Vertical Steam Trap

Description

The IBV series Z inverted bucket steam trap is manufactured using alloy steel for the body and cover; with internal components being made of stainless steel. It is suitable for use with saturated and superheated steam and in high pressure and high temperature applications. The IBV is fully automatic and has been designed in such a way that there is minimal friction from mechanism movement; valve closure is immediate, without any steam loss and the discharge action is positive with no equivocal phases. The standard version will be supplied with bolted support brackets.

On the cover of the IBV there in a ⅜" hole, threaded and plugged, to eliminate any water discharge after being hydraulically tested before leaving the factory. This hole can be reopened on site for the customer to perform periodic hydro testing.



Standards

This steam trap is designed following the ASME VIII Mechanical Design Code and complies with the requirements of the Pressure Equipment Directive and carries the CE mark when so required.

Certification

The product is available with material certification to EN 10204 3.1.

Note: All certification/inspection requirements must be stated at the time of order placement.

Optional extras

On request the IBV steam trap can be equipped with the following:

An **inbuilt stainless steel check valve**
Please note that this option is only available for units that have a ΔP maximum differential pressure of 40 bar (580 psi) and above - See the IBV product nomenclature and selection guide for clarification.

A **Stellite plug and seat** Alloy steel 6

Available types

Series C	**Carbon steel** body and cover	**See** TI-P067-10
Series C-LF2	**Carbon steel** body and cover with a material specification of **A350 LF2** for low temperature applications down to -46 °C (-51 °F)	**See** TI-P067-13
Series Z	**Alloy steel** body and cover	

Sizes and pipe connections

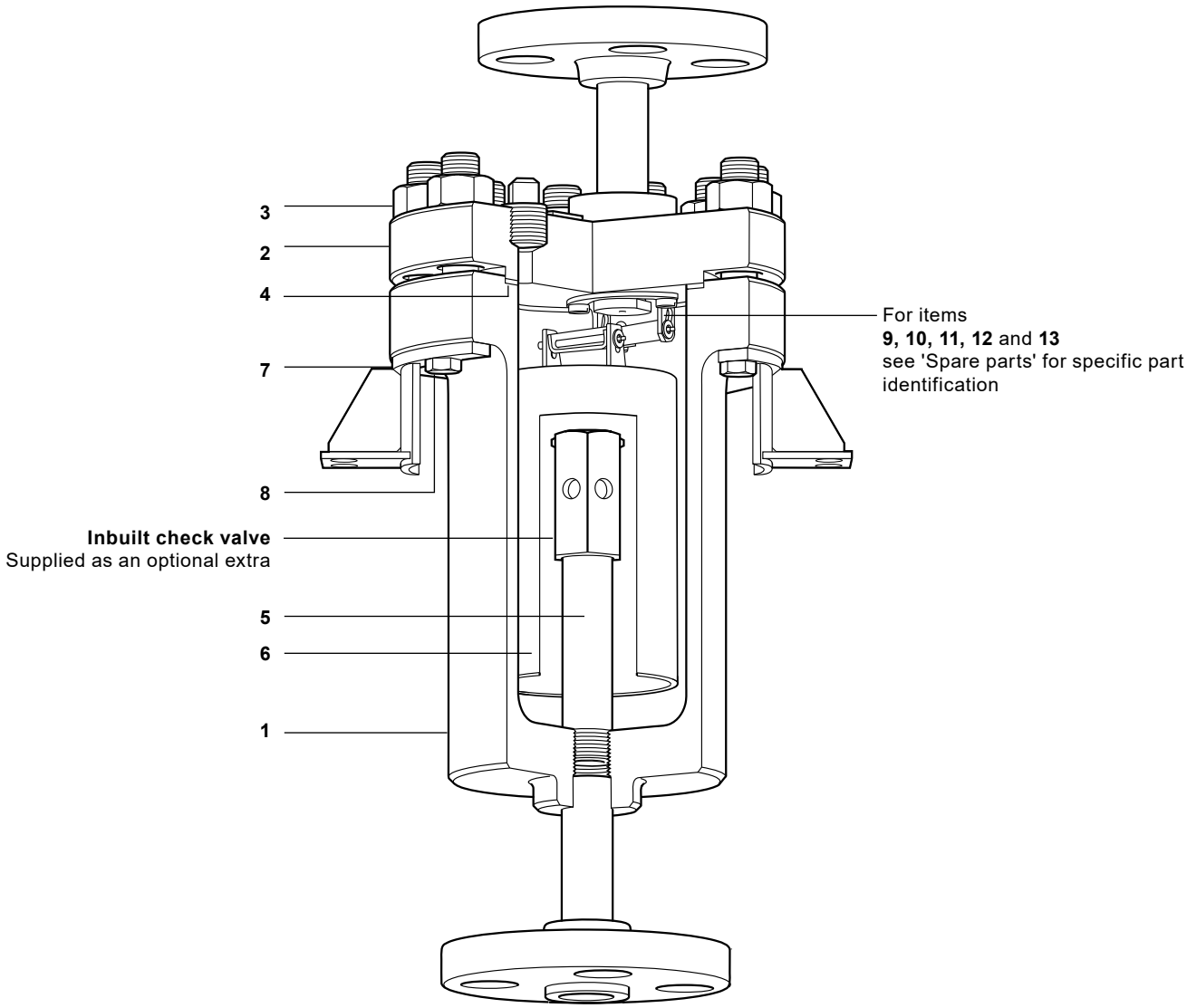
Please note that all standard flanges (as noted below) will be slip-on type. Weld-neck type flanges can be supplied to special order and must be specified at the time of order placement.

½", ¾", 1", 1½", 2" and 3"
Screwed BSP or NPT
Socket weld, according to ASME B 16.11

½", ¾", 1", 1½", 2" and 3"
Flanged ASME B 16.5 ASME Class 150, 300, 600 and 900

DN15, DN20, DN25, DN40, DN50 and DN80
Flanged EN 1092 PN16, PN25, PN40, PN63 and PN100

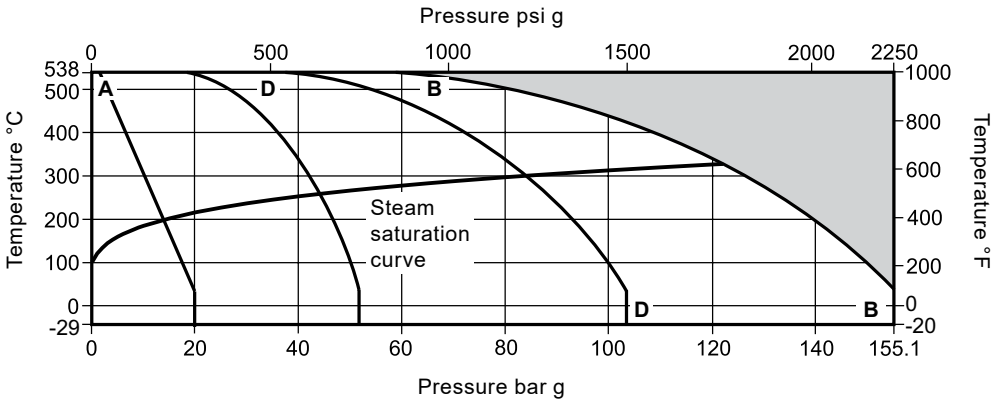
Materials



No.	Part	Material	
1	Body	Alloy steel	PED ASTM A182 F22 CL.3
2	Cover	Alloy steel	ASTM A182 F11
3	Cover bolts	Alloy Steel	ASTM A193 B16
	Nuts		ASTM A194 GR. 7
	Nace version	(External parts only)	
		Cover bolts	A479XM-19
		Nuts	A194 Gr. 8M
4	Cover gasket	Reinforced graphite	
5	Channelling pipe	Stainless steel	A335 P22

No.	Part	Material	
6	Bucket	Stainless steel	AISI 316
7	Bracket	Carbon Steel	A516 Gr. 70
8	Bracket screw	Stainless steel	AISI 316
9	Lever pin	Stainless steel	AISI 316
10	Split pin	Stainless steel	AISI 316
11	Valve seat	Stainless steel	400 series
12	Valve head	Stainless steel	400 series
13	Valve lever	Stainless steel	AISI 316

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged ASME



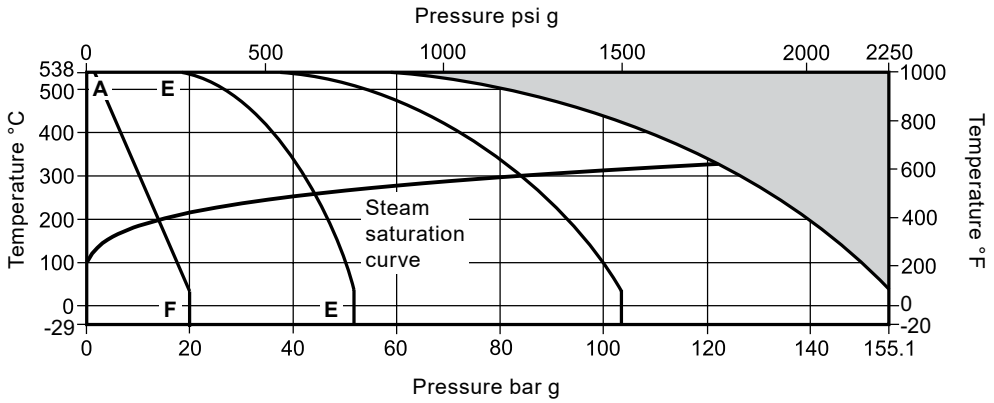
The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

*** Please note** that the PMO is limited to the maximum ΔP of the selected IBV.

		Body design conditions		ASME Class 900
A-B-B	Screwed and Socket weld ASME Class 900	PMA - Maximum allowable pressure	155.1 bar g @ 38 °C	2 250 psi g @ 100 °F
		TMA - Maximum allowable temperature	538 °C @ 55.3 bar g	1 000 °F @ 800 psi g
		Minimum allowable temperature	-29 °C	-20 °F
		* PMO - Maximum operating pressure for saturated steam service	123 bar g @ 327 °C	1 784 psi g @ 622 °F
		TMO - Maximum operating temperature for saturated steam service	327 °C @ 123 bar g	622 °F @ 1784 psi g
		Designed for a maximum cold hydraulic test pressure of:	232.6 bar g	3 375 psi g
A-D-D	ASME Class 600	PMA - Maximum allowable pressure	103.4 bar g @ 38 °C	1 500 psi g @ 100 °F
		TMA - Maximum allowable temperature	538 °C @ 36.9 bar g	1 000 °F @ 535 psi g
		Minimum allowable temperature	-29 °C	-20 °F
		* PMO - Maximum operating pressure for saturated steam service	85.6 bar g @ 300 °C	1 241 psi g @ 573 °F
		TMO - Maximum operating temperature for saturated steam service	300 °C @ 85.6 bar g	573 °F @ 1241 psi g
		Designed for a maximum cold hydraulic test pressure of:	155.1 bar g	2 250 psi g

Pressure/temperature limits continued on next page

Pressure/temperature limits (ISO 6552) - Screwed, Socket weld and Flanged ASME (continued)

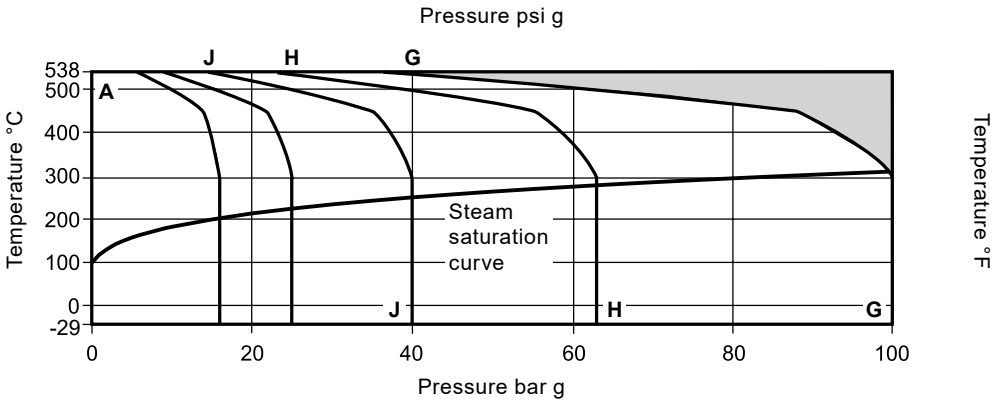


The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO is limited to the maximum ΔP of the selected IBV.

		Body design conditions		ASME Class 900
A-E-E	ASME Class 300	PMA - Maximum allowable pressure	51.7 bar g @ 38 °C	750 psi g @ 100 °F
		TMA - Maximum allowable temperature	538 °C @ 18.4 bar g	1 000 °F @ 265 psi g
		Minimum allowable temperature	-29 °C	-20 °F
		* PMO - Maximum operating pressure for saturated steam service	45.6 bar g @ 259 °C	661 psi g @ 499 °F
		TMO - Maximum operating temperature for saturated steam service	259 °C @ 45.6 bar g	499 °F @ 661 psi g
		Designed for a maximum cold hydraulic test pressure of:	77.5 bar g	1 125 psi g
A-F-F	ASME Class 150	PMA - Maximum allowable pressure	19.6 bar g @ 38 °C	290 psi g @ 100 °F
		TMA - Maximum allowable temperature	538 °C @ 1.4 bar g	1 000 °F @ 20 psi g
		Minimum allowable temperature	-29 °C	-20 °F
		* PMO - Maximum operating pressure for saturated steam service	13.8 bar g @ 197 °C	200 psi g @ 387 °F
		TMO - Maximum operating temperature for saturated steam service	197 °C @ 5.5 bar g	387 °F @ 80 psi g
		Designed for a maximum cold hydraulic test pressure of:	29.7 bar g	435 psi g

Pressure/temperature limits (ISO 6552) - Flanged EN1092-1



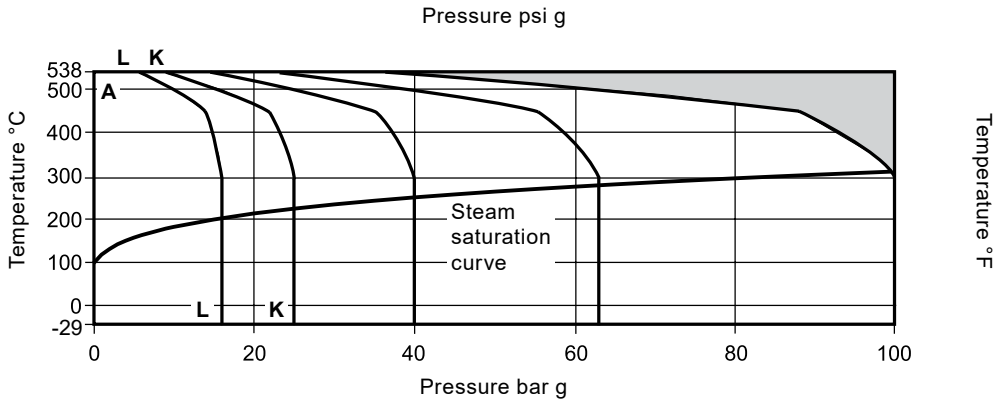
The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO is limited to the maximum ΔP of the selected IBV.

		Body design conditions	PN100
A-G-G	**PN100**	PMA - Maximum allowable pressure	100 bar g @ 50 °C
		TMA - Maximum allowable temperature	538 °C @ 37.1 bar g
		Minimum allowable temperature	-29 °C
		* PMO - Maximum operating pressure for saturated steam service	99.4 bar g @ 311 °C
		TMO - Maximum operating temperature for saturated steam service	279 °C @ 63 bar g
		Designed for a maximum cold hydraulic test pressure of:	143 bar g
A-H-H	**PN63**	PMA - Maximum allowable pressure	63 bar g @ 50 °C
		TMA - Maximum allowable temperature	538 °C @ 23.4 bar g
		Minimum allowable temperature	-29 °C
		* PMO - Maximum operating pressure for saturated steam service	63 bar g @ 279 °C
		TMO - Maximum operating temperature for saturated steam service	279 °C @ 63 bar g
		Designed for a maximum cold hydraulic test pressure of:	90 bar g
A-J-J	**PN40**	PMA - Maximum allowable pressure	40 bar g @ 50 °C
		TMA - Maximum allowable temperature	538 °C @ 14.8 bar g
		Minimum allowable temperature	-29 °C
		* PMO - Maximum operating pressure for saturated steam service	40 bar g @ 251 °C
		TMO - Maximum operating temperature for saturated steam service	251 °C @ 40 bar g
		Designed for a maximum cold hydraulic test pressure of:	57.2 bar g

Pressure/temperature limits continued on next page

Pressure/temperature limits (ISO 6552) - Flanged EN1092-1 (continued)



The product **must not** be used in this region or beyond the parameter of the PMA or TMA of the relative end connection.

* **Please note** that the PMO is limited to the maximum ΔP of the selected IBV.

		Body design conditions	PN100
A-K-K	**PN25**	PMA - Maximum allowable pressure	25 bar g @ 50 °C
		TMA - Maximum allowable temperature	425 °C @ 11.2 bar g
		Minimum allowable temperature	-29 °C
		* PMO - Maximum operating pressure for saturated steam service	25 bar g @ 226 °C
		TMO - Maximum operating temperature for saturated steam service	226 °C @ 25 bar g
		Designed for a maximum cold hydraulic test pressure of:	35.7 bar g
A-L-L	**PN16**	PMA - Maximum allowable pressure	16 bar g @ 50 °C
		TMA - Maximum allowable temperature	538 °C @ 5.9 bar g
		Minimum allowable temperature	-29 °C
		* PMO - Maximum operating pressure for saturated steam service	16 bar g @ 204 °C
		TMO - Maximum operating temperature for saturated steam service	204 °C @ 16 bar g
		Designed for a maximum cold hydraulic test pressure of:	22.8 bar g

Capacities - DN15 (½")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 500 kg/h

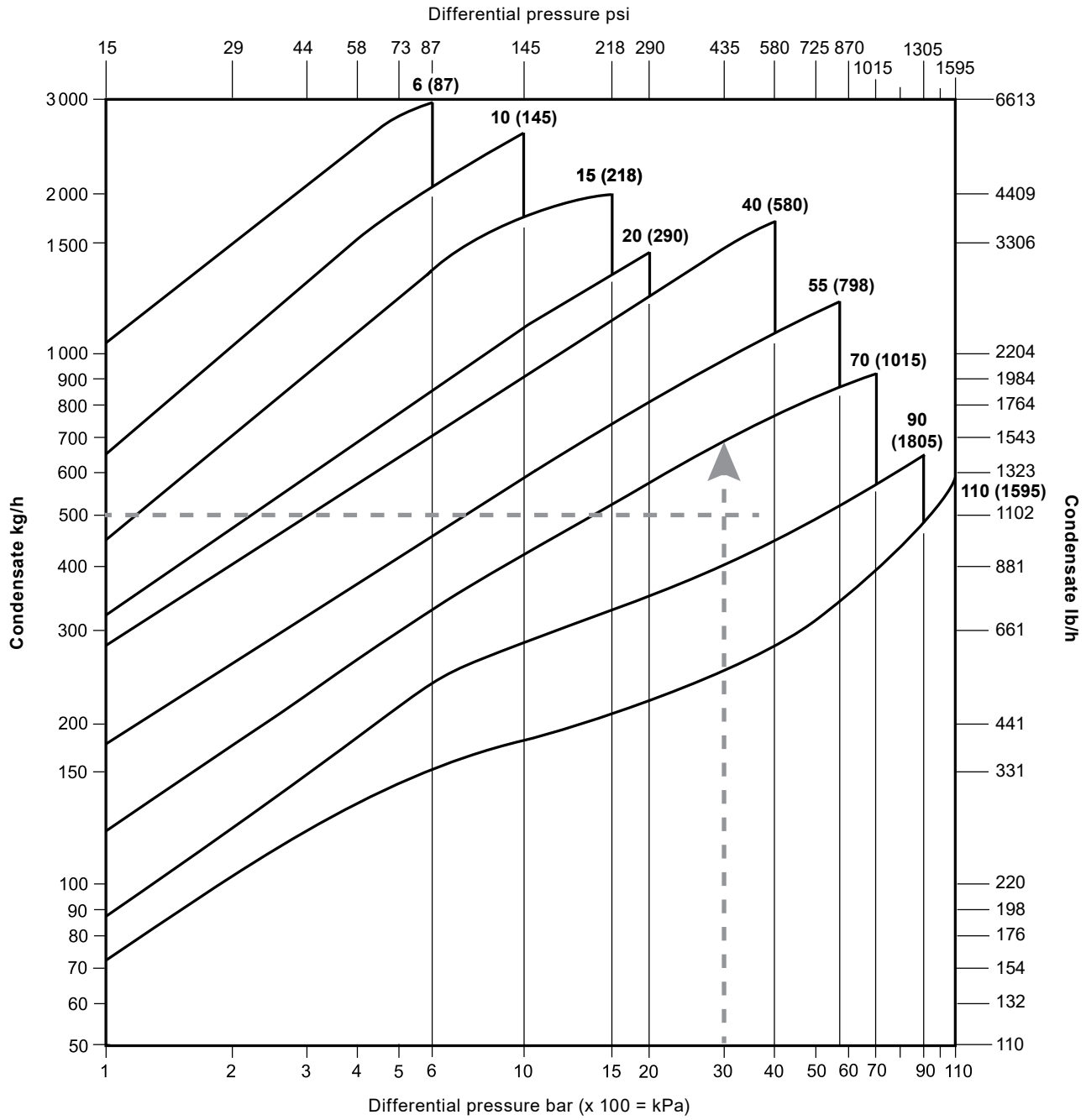
Effective differential pressure = 30 bar

Upstream pressure = 45 bar g

Backpressure = 15 bar g

The unit of choice would have a **ΔP max. differential pressure of 70 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN20 (¾")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 1050 kg/h

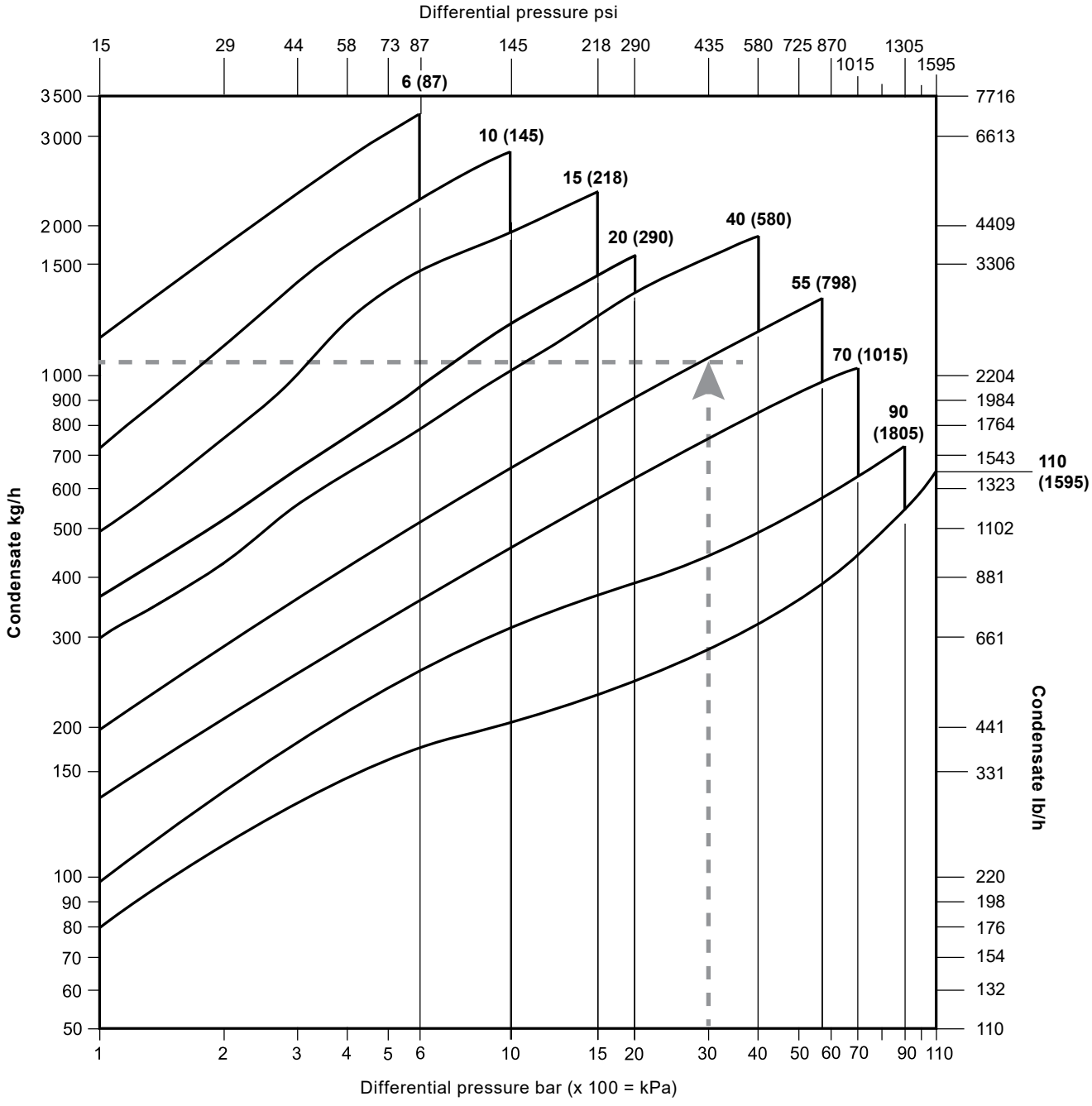
Effective differential pressure = 30 bar

Upstream pressure = 45 bar g

Backpressure = 15 bar g

The unit of choice would have a **ΔP max. differential pressure of 55 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN25 (1")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 2000 kg/h

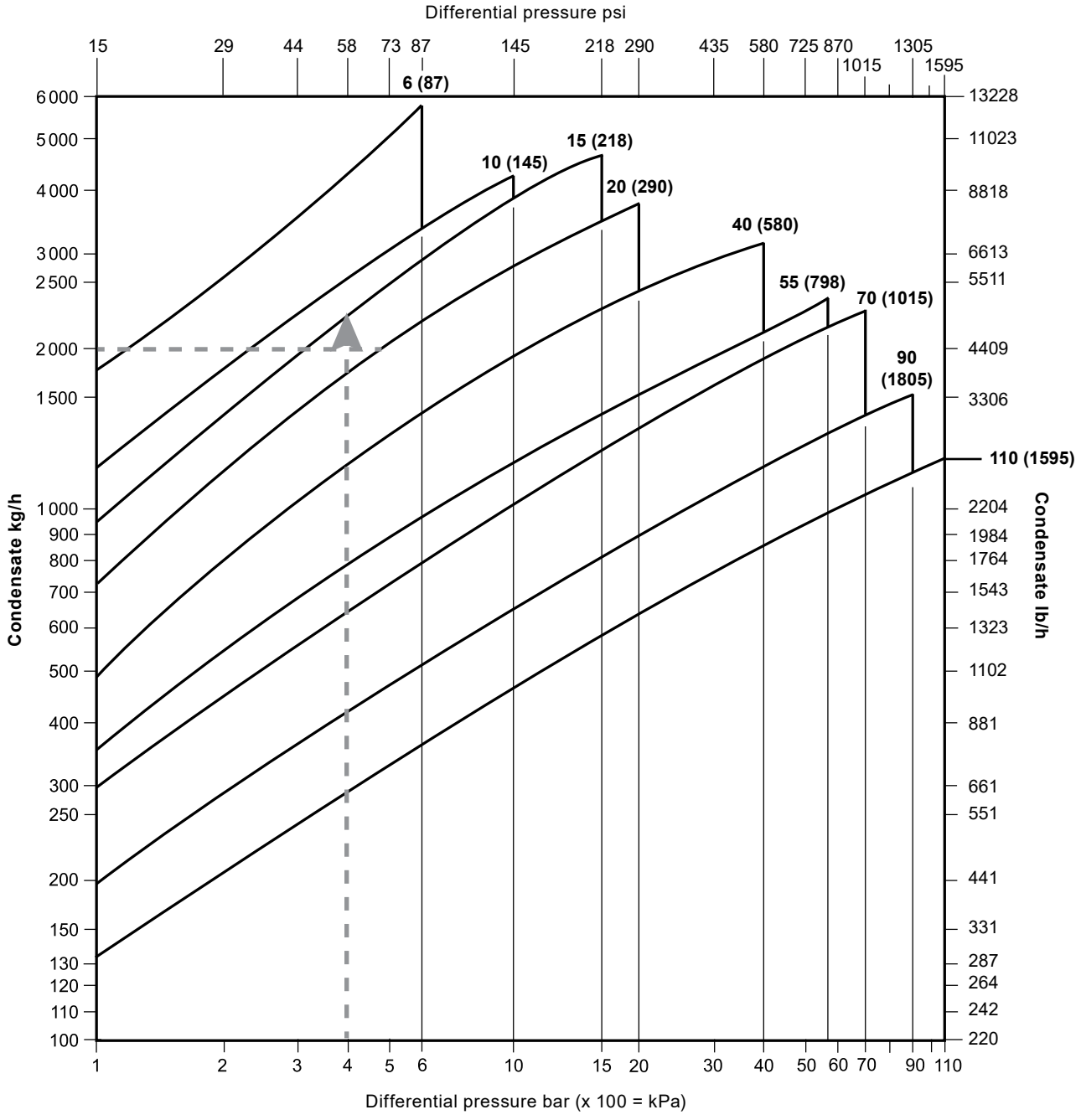
Effective differential pressure = 4 bar

Upstream pressure = 5 bar g

Backpressure = 1 bar g

The unit of choice would have a **ΔP max. differential pressure of 15 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN40 (1½")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 2000 kg/h

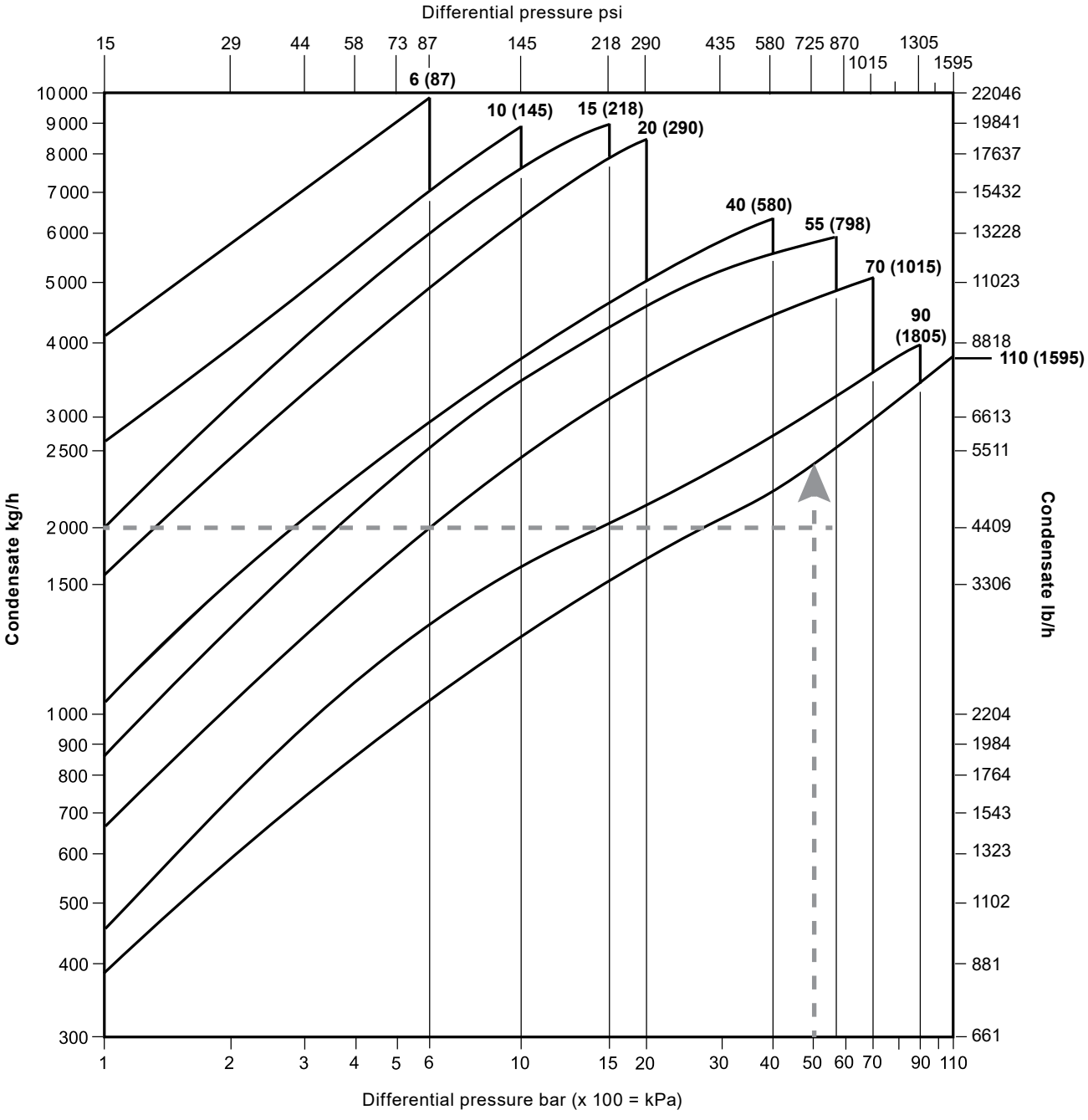
Effective differential pressure = 50 bar

Upstream pressure = 75 bar g

Backpressure = 25 bar g

The unit of choice would have a **ΔP max. differential pressure of 110 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN50 (2")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 6000 kg/h

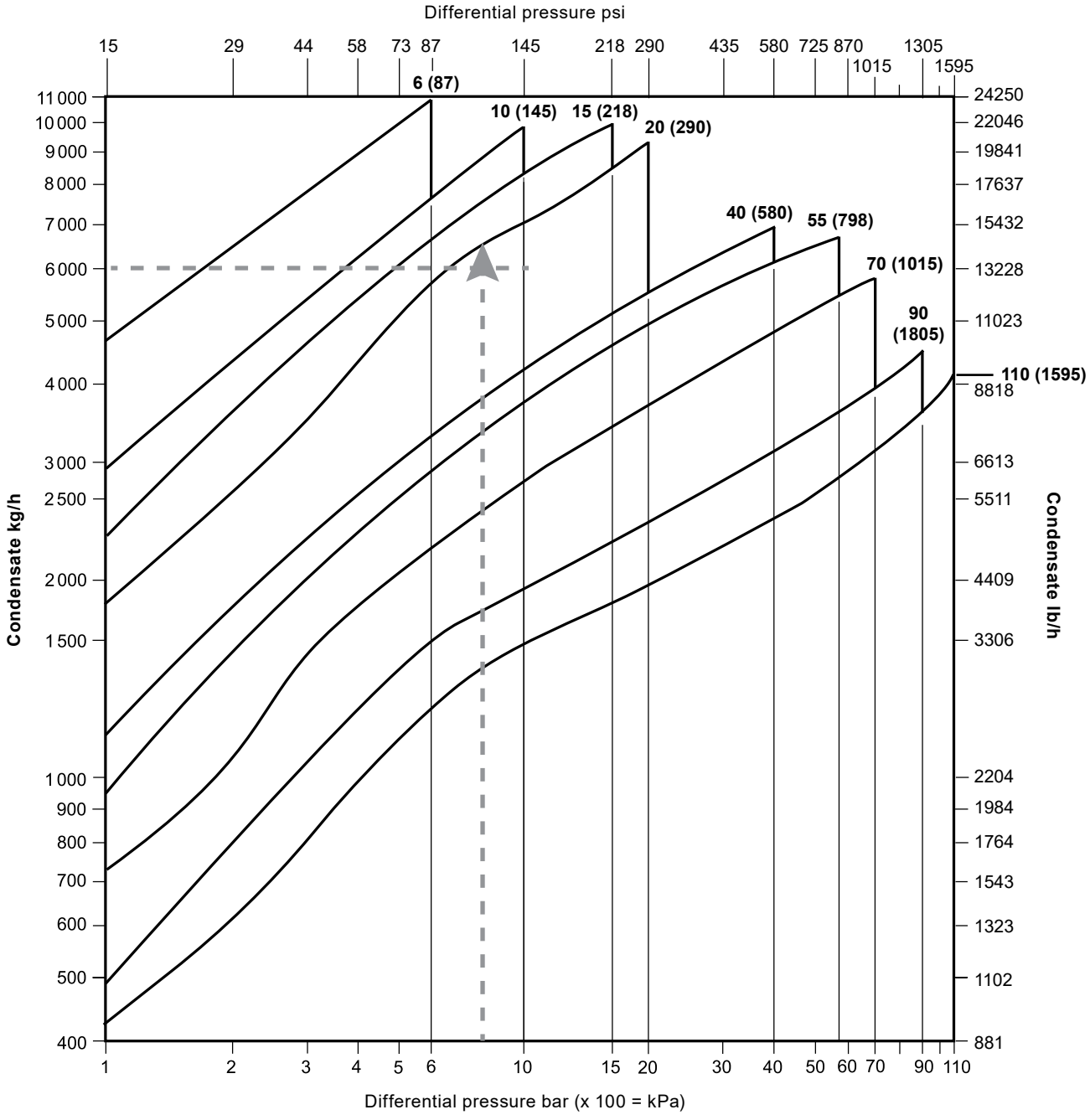
Effective differential pressure = 8 bar

Upstream pressure = 10 bar g

Backpressure = 2 bar g

The unit of choice would have a **ΔP max. differential pressure of 20 bar** which is greater than the upstream pressure.

For full product selection and nomenclature follow the guide on page 13.



Capacities - DN80 (3")

Note: IBV inverted bucket steam traps should be selected for use at the most appropriate working differential pressure and not on the basis of load.

Condensate discharge capacities (kg/h) - The discharge capacities in the table are referring to the operating temperature of the saturated steam and the PMO of the steam trap shall be the relevant ΔP maximum differential pressure of each specific model.

For optimum trap selection you need to know the following criteria:

a) The hourly amount of condensate to be discharged, inclusive of the safety factor: x 1.5 for continuous use, x 2 to x 3 for intermittent use.

b) The effective differential pressure.

Working example:

Condensate discharge = 5000 kg/h

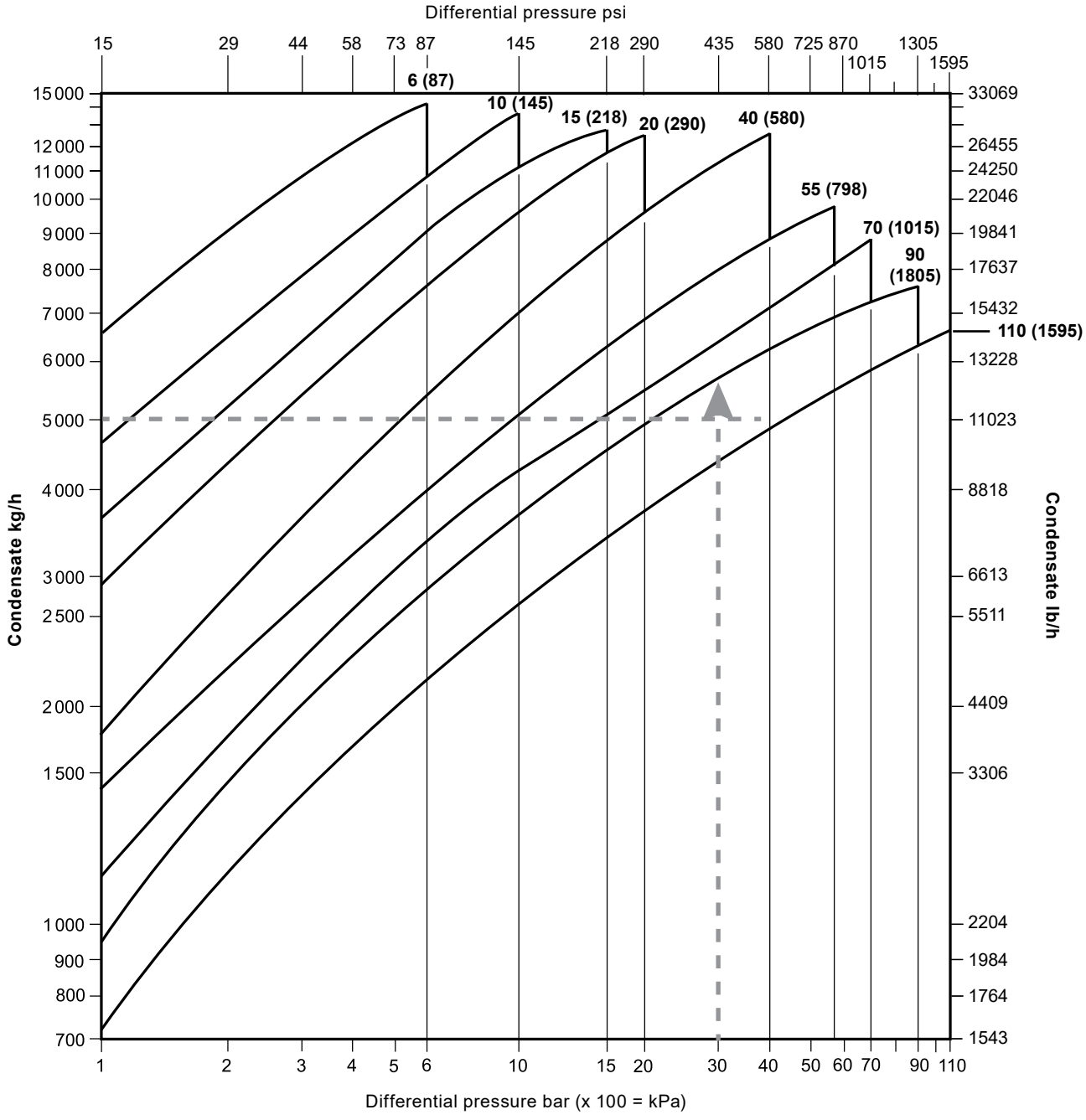
Effective differential pressure = 30 bar

Upstream pressure = 55 bar g

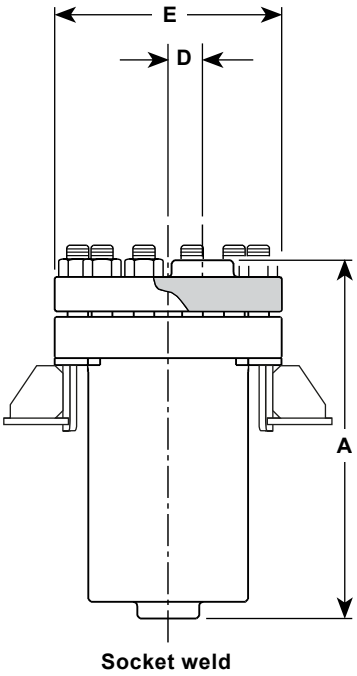
Backpressure = 25 bar g

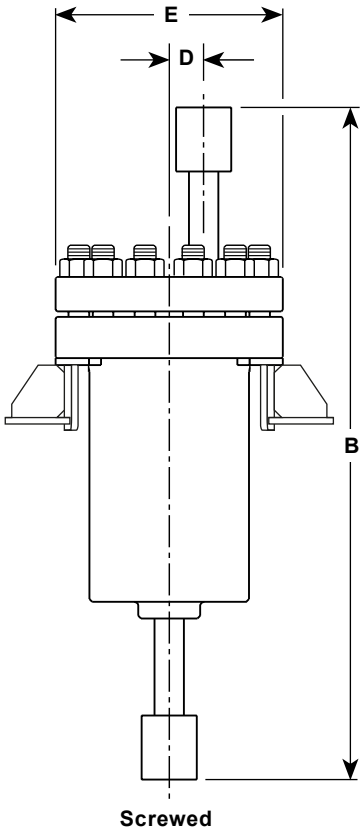
The unit of choice would have a **ΔP max. differential pressure of 90 bar** which is greater than the upstream pressure.

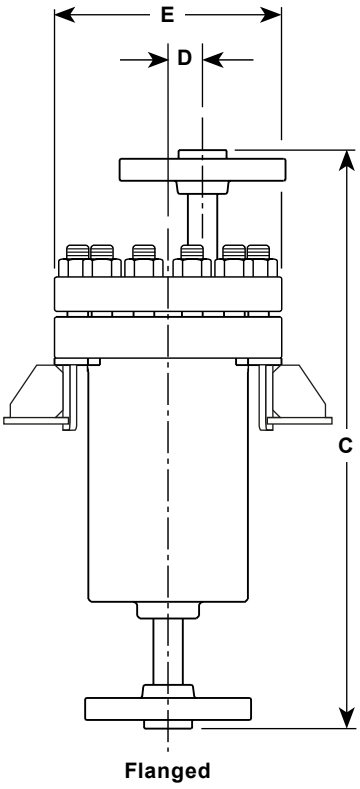
For full product selection and nomenclature follow the guide on page 13.



Dimensions/weights (approximate) in mm and kg







IBV size		A	B	C	D	E
DN15	½"	260 (10.2)	488 (19.2)	420 (16.5)	25 (1)	165 (6.5)
DN20	¾"					
DN25	1"	345 (13.6)	616 (24.3)	530 (20.9)	40 (1.6)	210 (8.3)
DN40	1½"	411 (16.2)	774 (30.5)	650 (25.6)	39 (1.5)	265 (10.4)
DN50	2"		782 (30.8)			
DN80	3"	532 (20.9)	1 026 (40.4)	850 (33.5)	36 (1.4)	305 (12)

Weights (approximate) in kg (lb)

IBV size		BSP + NPT	Socket weld	Flanged ASME Class:					Flanged EN 1092:				
				150	300	600	900	1500*	PN16	PN25	PN40	PN63	PN100
DN15	½"	20 (44)	18 (40)	20 (44)	20 (44)	20 (44)	22 (49)	22 (49)	20 (44)	20 (44)	20 (44)	20 (44)	22 (49)
DN20	¾"	26 (57)	24 (53)	26 (57)	28 (62)	28 (62)	30 (66)	30 (66)	28 (62)	28 (62)	28 (62)	28 (62)	30 (66)
DN25	1"	42 (93)	39 (86)	42 (93)	44 (97)	44 (97)	48 (106)	48 (106)	42 (93)	42 (93)	42 (93)	42 (93)	46 (101)
DN40	1½"	68 (150)	65 (143)	70 (154)	72 (159)	72 (159)	78 (172)	78 (172)	70 (154)	70 (154)	70 (154)	70 (154)	74 (163)
DN50	2"	68 (150)	65 (143)	72 (159)	74 (163)	76 (168)	88 (194)	88 (194)	72 (159)	72 (159)	72 (159)	74 (159)	78 (172)
DN80	3"	125 (276)	120 (265)	132 (291)	136 (300)	138 (304)	152 (335)	162 (357)	130 (287)	130 (287)	130 (287)	134 (295)	138 (304)

* on request

IBV product nomenclature and selection guide:

Please note that other units are available on request to suit the specifics of a particular process application.

Series			Z =	Alloy steel	Z
PMO @ Saturated steam temperature for **Alloy steel** the body rating			123 bar g =	ASME Class 900 body	123
ΔP maximum differential pressure			ΔP =	6, 10, 15, 20, 40, 55, 70, 90, 110 bar	110
Connections	**Size**		=	½", ¾", 1", 1½", 2", 3" **or** DN15, DN20, DN25, DN40, DN50, DN80	3"
	Screwed		=	BSP or NPT	ASME Class 300
	Socket weld		=	According to ASME B 16.11	
	Flanged	ASME	=	ASME Class 150, 300, 600, 900, (*1500 available on request)	
		EN 1092	=	PN16, PN25, PN40, PN63, PN100	
Optional extras			Blank =	Standard	
			NACE =	NACE compliancy	
			CV =	Check valve **Please note** that this option is only available for units that have a ΔP maximum differential pressure of 40 bar and above - See above.	

IBV product selection example: IBV - Z - 123 - 110 - 3" - ASME Class 300 -

How to order

1 off Spirax Sarco IBV-Z-123-110-3"-Flanged ASME Class 300 inverted bucket vertical steam trap having an alloy steel body and cover with stainless steel internals.

The following will be supplied, if specified, at the time of order placement:

1. A special name-plate when a U-STAMP has been specified.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note

The trap must be installed below the drain point with the body upright in a vertical position, the cover at the top and the inlet connection at the bottom; this orientation will ensure that the bucket mechanism will rise and fall vertically without any friction. It is recommended that a strainer is installed upstream of the IBV to protect it from contamination.
To permit safe inspection for cleaning or maintenance purpose it is again recommended that suitable shut-off valves are installed upstream and downstream of the IBV application.
It needs to be appreciated that there is blast discharge with this device, consequently the downstream accessories, if any, should be installed at a minimum distance of 1 m from the IBV.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

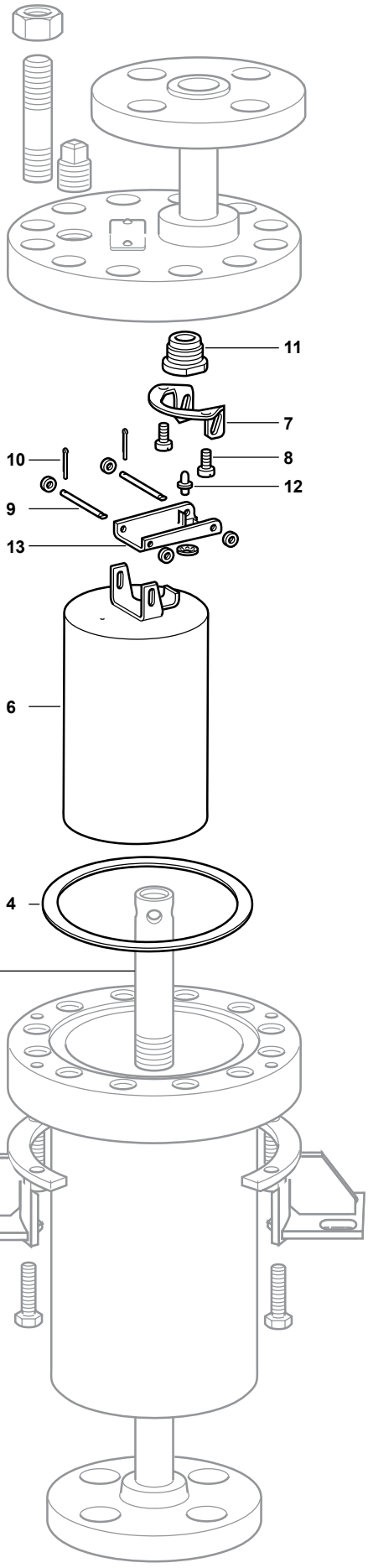
Available spares

Valve assembly		**4**, **7**, **8**, **9**, **10**, **11**, **12**, **13**
Bucket assembly		**4**, **6**, **9**, **10**
Cover gasket	(packet of 3)	**4**

How to order spares

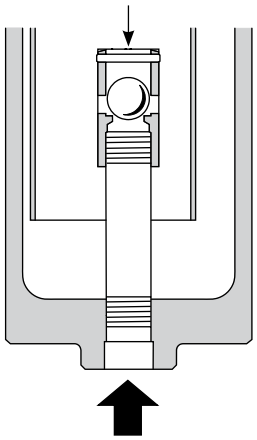
Always order spares by using the description given in the column headed 'Available spares' and state the type of trap, pressure rating and size and type of the connections.

Example: 1 - Valve assembly for a Spirax Sarco IBV - Z - 123 - 110 - 3" - Flanged ASME Class 300 inverted bucket vertical steam trap.



Optional extra

Inbuilt stainless steel check valve



Please note that this option is only available for units that have a DP maximum differential pressure of 40 bar (580 psi) and above -
See the IBV product nomenclature and selection guide on page 15 for clarification.

TI-P110-01
CMGT Issue 10

SIB30 and SIB30H Stainless Steel Sealed Inverted Bucket Steam Traps

Description
The SIB30 and SIB30H are all stainless steel sealed inverted bucket steam traps.

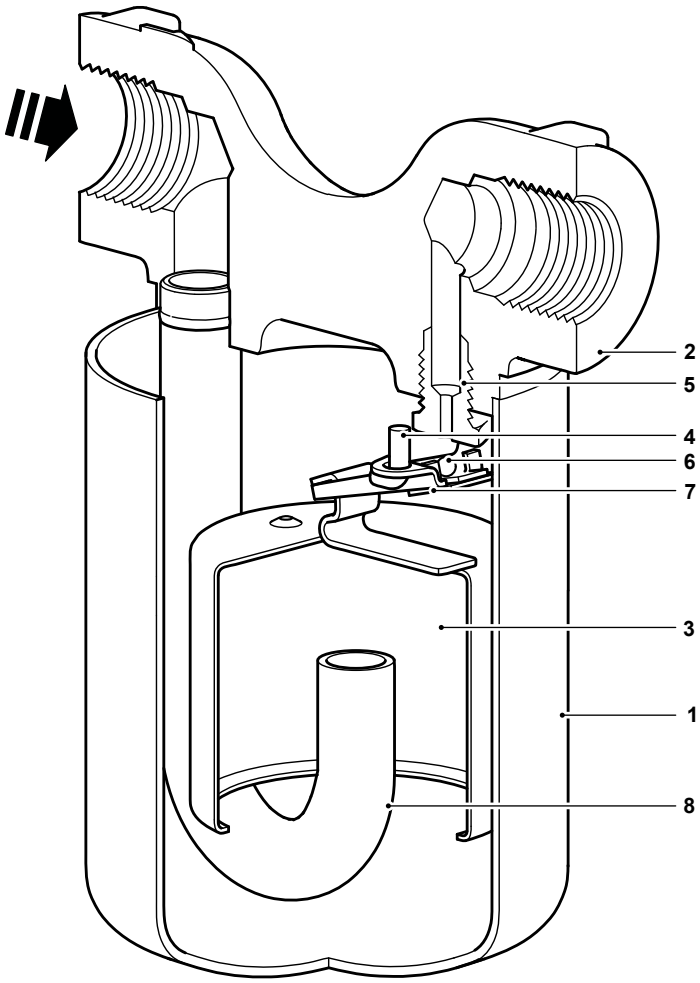
Standards
These products fully comply with the requirements of the Pressure Equipment Directive (PED)

Certification
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

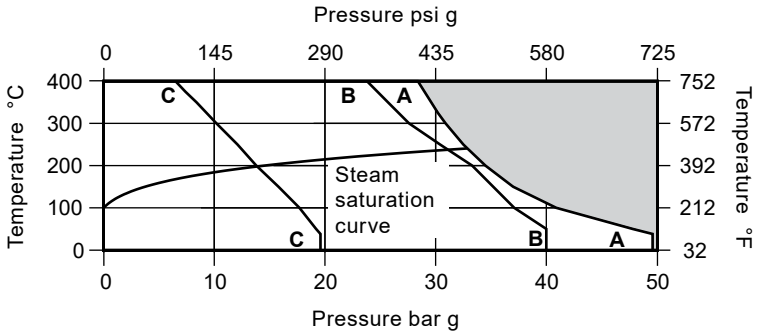
Sizes and pipe connections
½" and ¾" screwed BSP or NPT.
DN15 and DN20 socket weld ends (BS 3799).
DN15 and DN20 flanged ASME 150, ASME 300 and EN 1092 PN40 as standard. Alternative flanges are also available, on request, with JIS tables 20, 16 and 10 connections.

Materials

No.	Part	Material	
1	Cover	Stainless steel	ASTM A240 Gr. 304
2	Body	Stainless steel	A182 F304
	Flanges	Carbon steel	Mat No. 1.0460 (C22.8)
3	Bucket	Stainless steel	BS 1449 321 S 12
4	Pivot pin	Stainless steel	BS 970 304 S 15
5	Valve seat	Stainless steel	AISI 440B
6	Valve	Stainless steel	AISI 440B
7	Valve lever	Stainless steel	BS 1449 321 S 12
8	Internal tube	Stainless steel	BS 3605 304 S 14



Pressure/temperature limits (ISO 6552)



The product **must not** be used in this region.

A - B Flanged ASME 300, screwed and socket weld

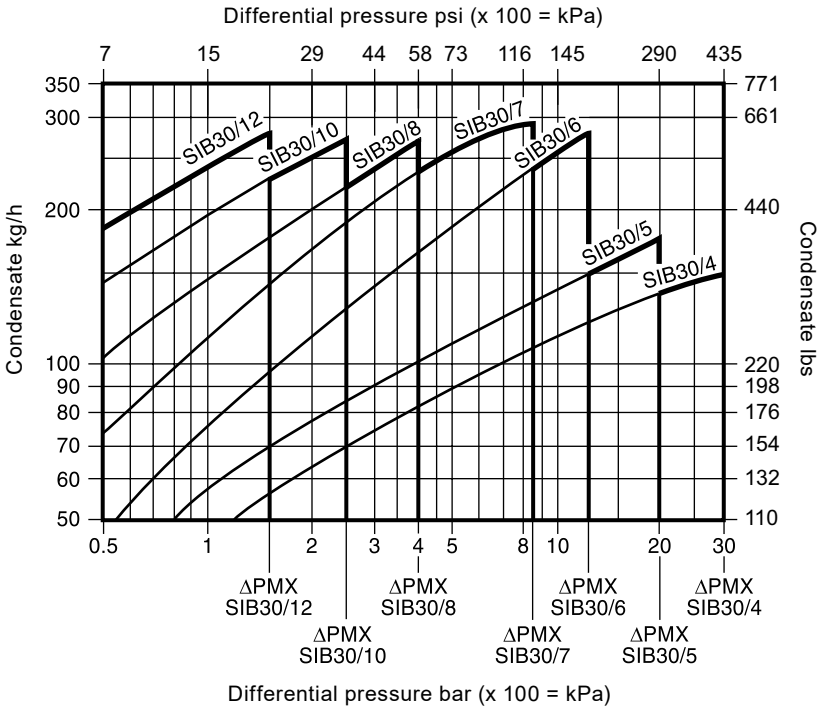
A - C Flanged EN 1092 PN40

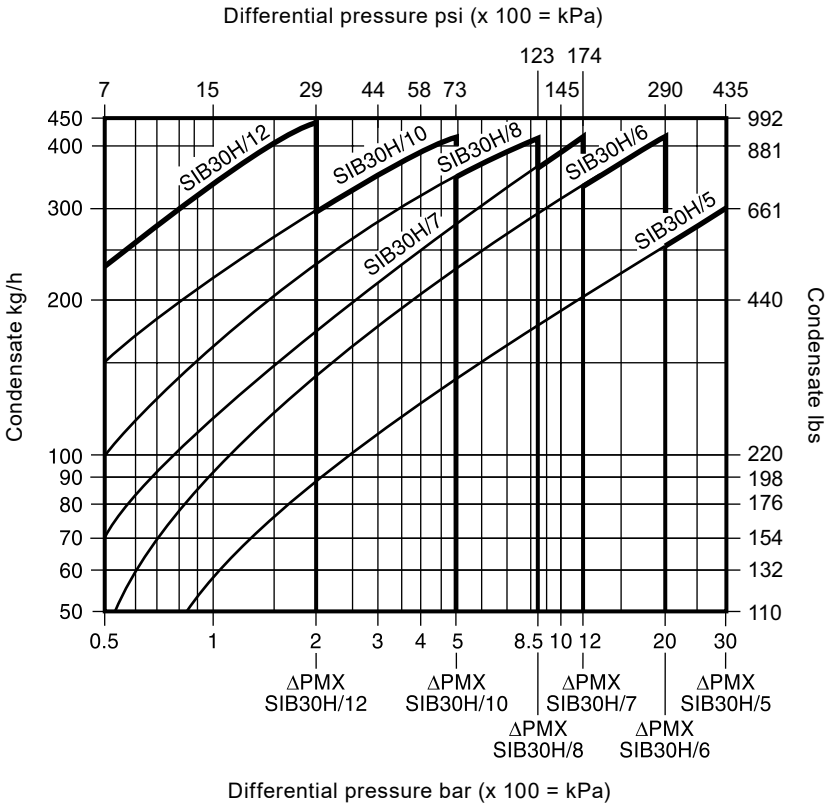
A - D Flanged ASME 150

Body design condition				PN50
PMA	Maximum allowable pressure		49 bar g @ 38 °C	711 psi g @ 100 °F
TMA	Maximum allowable temperature		400 °C @ 28 bar g	752 °F @ 406 psi g
Minimum allowable temperature			-29 °C	-20.2 °F
PMO	Maximum operating pressure for saturated steam service		30 bar g	435 psi g
TMO	Maximum operating temperature		400°C @ 28 bar g	752 °F @ 406 psi g
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
ΔPMX	Maximum differential pressure	30.0	**SIB30/4**	**SIB30H/5**
		20.0	**SIB30/5**	**SIB30H/6**
		12.0	**SIB30/6**	**SIB30H/7**
		8.5	**SIB30/7**	**SIB30H/8**
		5.0	**-**	**SIB30H/10**
		4.0	**SIB30/8**	**-**
		2.5	**SIB30/10**	**-**
		2.0	**-**	**SIB30H/12**
		1.5	**SIB30/12**	**-**
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of			75 bar g	5.17 psi g

Capacities

Note: A trap should be selected for the most appropriate working pressure differential and not on the basis of load, e.g. 80 kg/h at 7 bar differential should be handled with the SIB30/7 and not the SIB30/4.





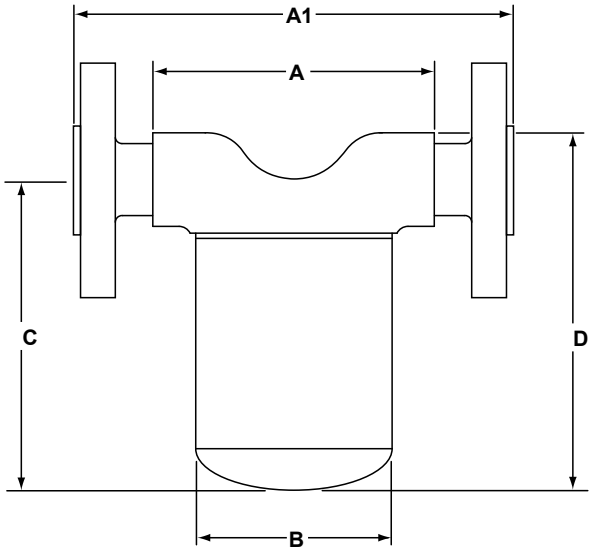
Dimensions/weights (approximate) in mm (inches) and kg (lbs)

SIB30

						Weight	
Size	A	A1	B	C	D	Scr/SW	Flg
DN15 - ½"	110 (4.33)	150 (5.91)	76 (3.0)	124 (4.88)	143 (5.63)	1.5 (3.31)	2.9 (6.39)
DN20 - ¾"							

SIB30H

						Weight	
Size	A	A1	B	C	D	Scr/SW	Flg
DN15 - ½"	110 (4.33)	150 (5.91)	76 (3.0)	159 (6.26)	177 (6.97)	1.75 (3.86)	3.15 (6.94)
DN20 - ¾"							



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P110-05) supplied with the product.

Installation note:

Install in a horizontal pipe, below the drain point. If installed in exposed positions, consideration should be given to insulating the trap.

How to order

Example: 1 off Spirax Sarco ½" screwed BSP SIB30/6 sealed inverted bucket steam trap.

Note: The cover (and flanges when specified) are welded to the body using the TIG process. Welds are approved in accordance with ASME section IX and BS EN 288.

TI-P110-02
CMGT Issue 9

SIB45
Stainless Steel
Sealed Inverted Bucket Steam Trap

Description

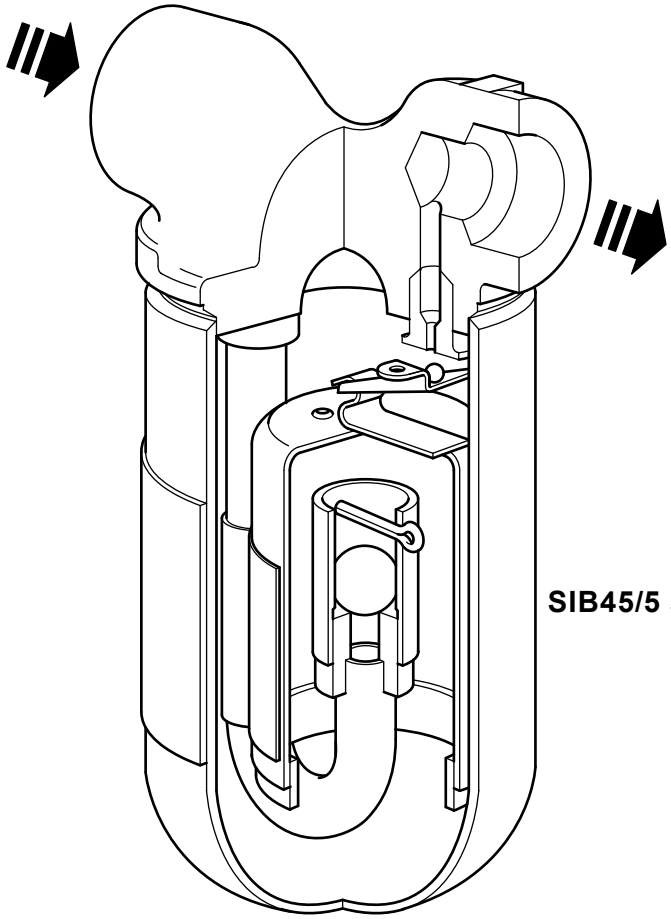
The SIB45 is an all stainless steel sealed inverted bucket steam trap. It is provided with pressure change assemblies for pressure differentials between 0.5 and 45 bar (7 and 65 psi). Traps for 45 bar (65 psi) are provided with an in-built check valve as standard.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification

This product is available with certification to EN 10204 3.1
Note: All certification / inspection requirements must be stated at the time of order placement.



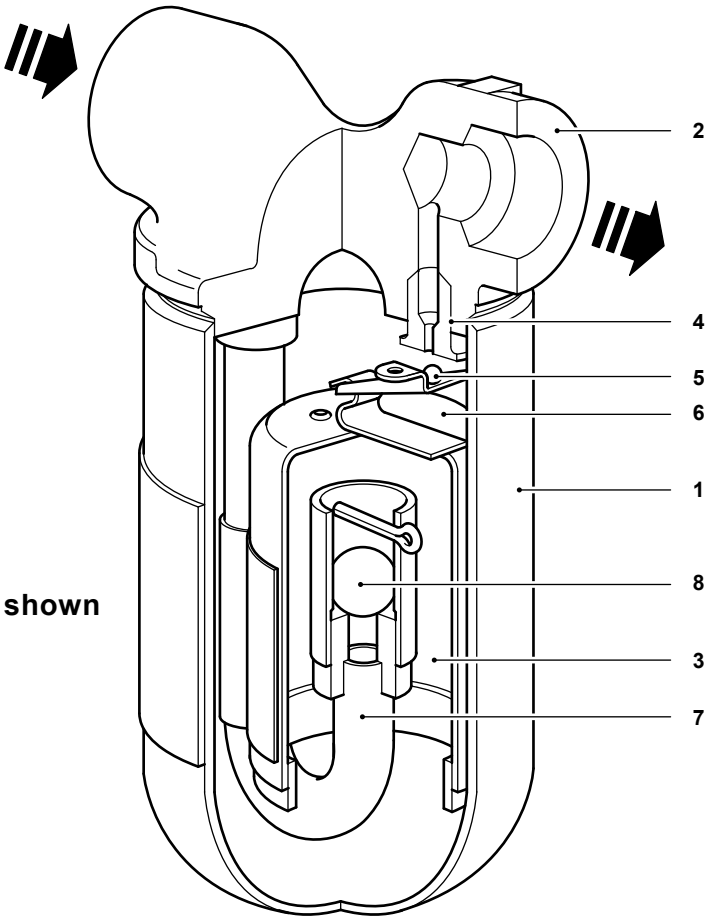
SIB45/5 shown

Sizes and pipe connections

SIB45/5
DN20 and DN25 (¾" and 1")
Butt weld ends ANSI B 16.5 (to suit ANSI B 36.10 Schedule 80 pipe).
Socket weld ends BS 3799 Class 3000 and ANSI B16.11.
Standard flanges DIN 2547 PN100 and ANSI 600.

SIB45/6, SIB45/8, SIB45/10
¾" and 1" screwed BSP T Rp (ISO 7-1) or NPT.
DN20 and DN25 Standard flanges ANSI 150 and ANSI 300.

Materials

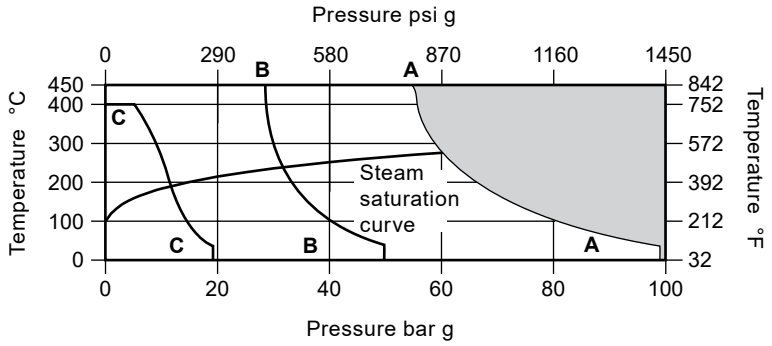


SIB45/5 shown

No.	Part	Material	
1	Cover	Stainless steel	ASTM A240 Gr. 304
	Body	Stainless steel	ASTM A 182 F 304
2	Pipes	Stainless steel	ASTM A 312 Gr. 304
	Flanges *	Stainless steel	ASTM A 182 F 304
3	Bucket	Stainless steel	
4	Valve seat	Stainless steel	
5	Valve	Stainless steel	
6	Valve lever	Stainless steel	
7	Internal tube	Stainless steel	
8	Check valve assembly (SIB45/5 only)	Stainless steel	

* **Note:** For all flanges except: ¾" PN100 - ASTM A 182 F 316

Pressure/temperature limits



The product **must not** be used in this region.

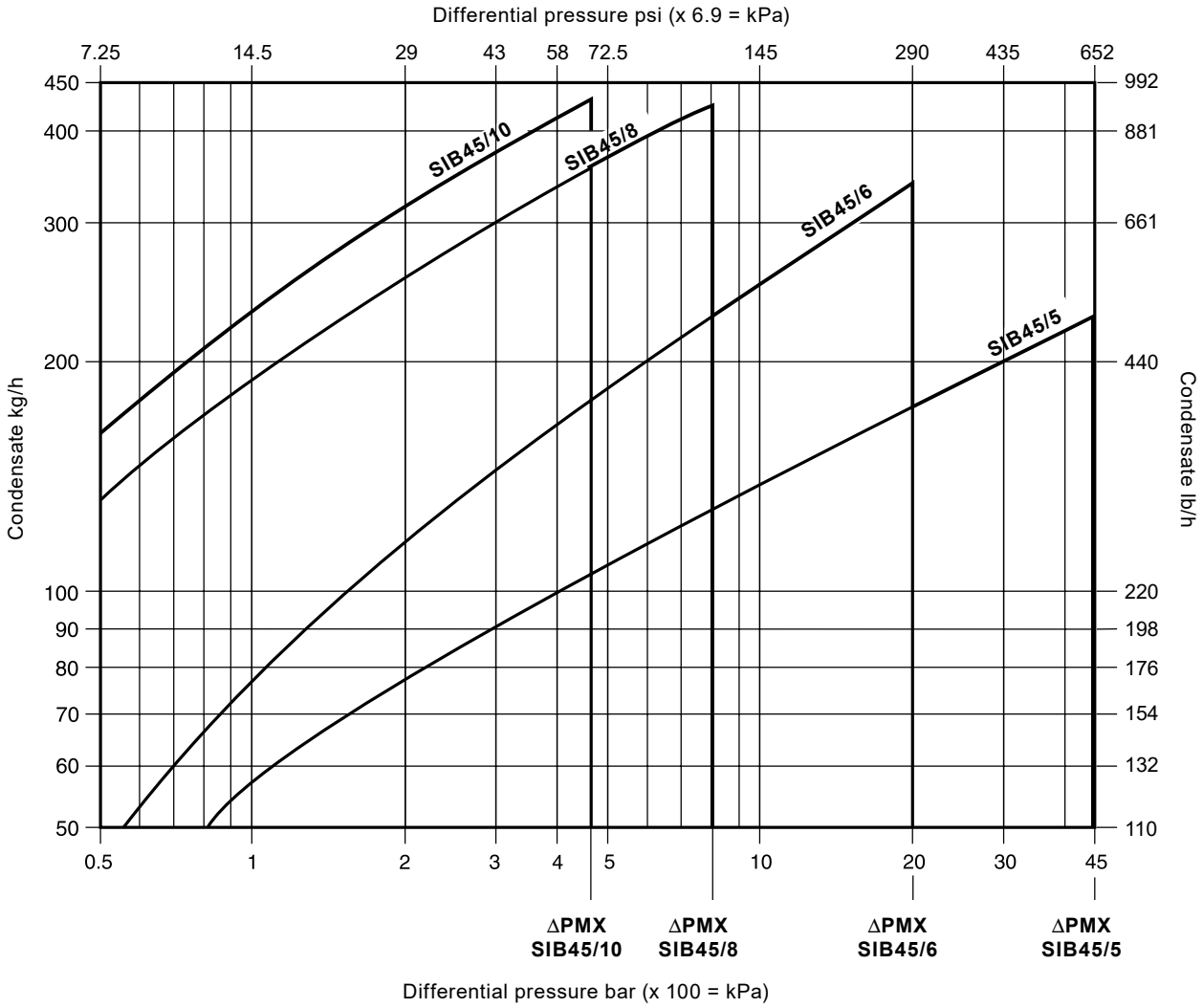
A - A Screwed, butt weld, socket weld, flanged DIN 2547 PN100 and ANSI 600.

B - B Flanged ANSI 300.

C - C Flanged ANSI 150.

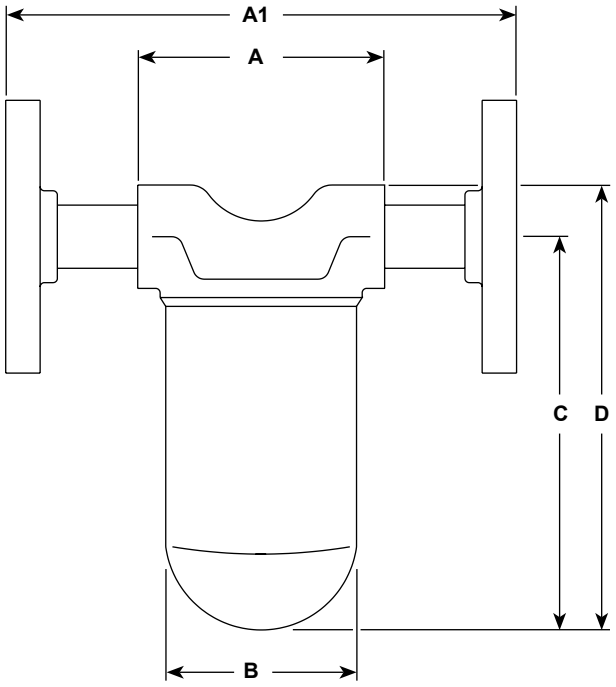
Body design conditions				PN100
PMA	Maximum allowable pressure		100 bar g @ 37 °C	1450 psi g @ 98.6 °F
TMA	Maximum allowable temperature		450 °C @ 54 bar g	842 °F @ 783 psi g
Minimum allowable temperature			-254 °C	-425 °F
PMO	Maximum operating pressure for saturated steam service		60 bar g	870 psi g
TMO	Maximum operating temperature		450 °C @ 54 bar g	842 °F @ 783 psi g
Minimum operating temperature			0 °C	32 °F
Note: For lower operating temperatures consult Spirax Sarco				
ΔPMX	Maximum differential pressure	SIB45/10	4.5 bar	65 psi g
		SIB45/6	20.0 bar	290 psi g
		SIB45/5	45.0 bar	653 psi g
Product is safe for use under full vacuum conditions				
Designed for a maximum cold hydraulic test pressure of			150 bar g	2176 psi g

Capacities



Note: A trap should be selected for the most appropriate working pressure differential and not on the basis of load, e.g.: 80 kg/h at 7 bar (176 lb/h at 102 psi) at 7 bar differential should be handled with the SIB45/8 and not the SIB45/5.

Dimensions / weights (approximate) in mm (inches) and kg (lbs)



Size	A	A1	B	C	D	Weight	
						SW / BW	Flanged
DN20 - ¾" **DN25 - 1"**	110 (4.33)	230 (9.06)	85 (3.35)	175 (6.89)	198 (7.80)	3 (6.61)	6.5 (14.3)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P110-05) supplied with the product.

Installation

Install in a horizontal pipe, below the drain point. If installed in exposed positions, consideration should be given to insulating the trap.

How to order

Example: 1 off Spirax Sarco DN20 SIB45 / 5 sealed inverted bucket steam trap flanged to ANSI 600.
Note: The cover (and flanges when specified) are welded to the body using the TIG process. Welds are approved in accordance with ASME section IX and BS 4870, Part 1.

TI-P063-06-US
Issue 1

Thermoton Liquid Expansion Steam Traps

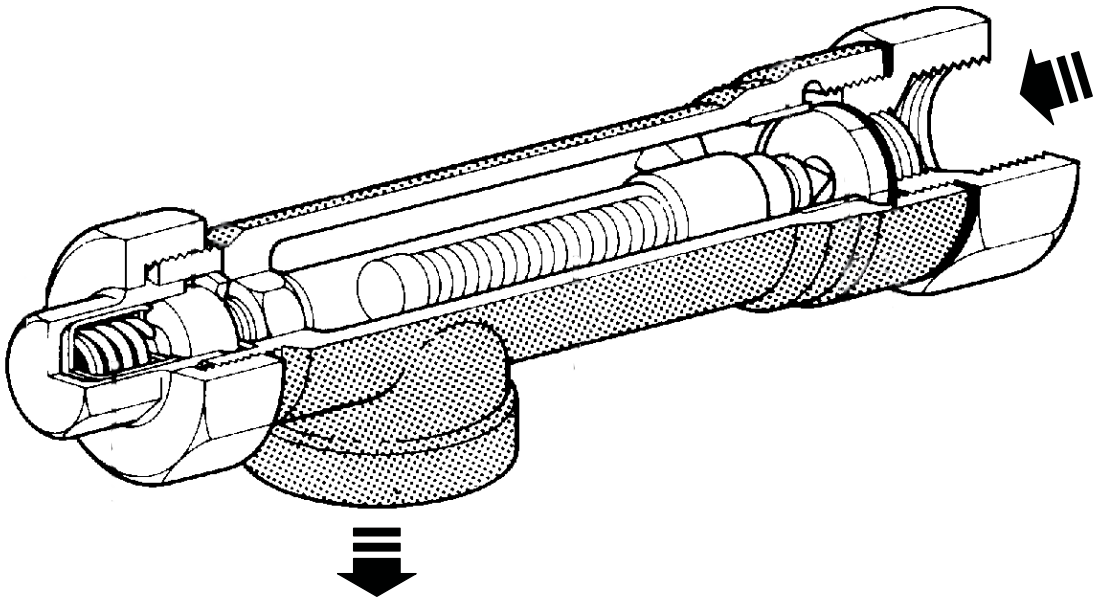
Description

Types "C" Thermotons can be field adjusted to hold back condensate until it has cooled to between 75 °F (24 °C) and 212 °F (100 °C). Four 50 °F (28 °C) adjustment ranges are available. Thermotons can therefore function as both steam traps and very simple temperature regulators.

Model	CL-6	CH-6
PMO	125 psi g (8.6 bar g)	300 psi g (20.7 bar g)
Sizes	¾"	
Connections	NPT	
Construction	Cast Iron Body	
	Brass and Stainless Steel Internals	
Options	BSP connections	

Typical applications

Steam trapping applications, such as outdoor storage tanks and non-critical tracing lines, where extreme sub-cooling is desirable to conserve energy. Automatic drainage of steam traps and process equipment in which residual condensate may freeze if the steam supply is interrupted.



Limiting operating conditions

PMO Maximum operating pressure		CL:	125 psi g	(8.6 bar g)
		CH:	300 psi g	(20.7 bar g)
Maximum operating temperature		Maximum setting	212 °F	(100 °C)

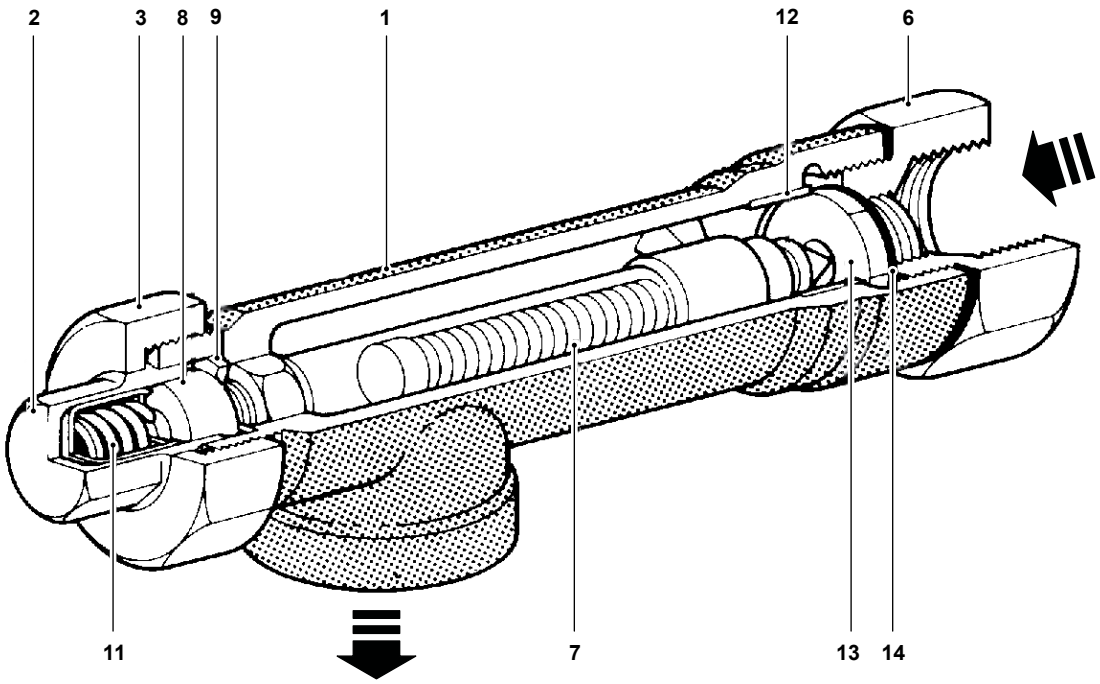
Pressure shell design conditions

PMA	Maximum allowable pressure	300 psi g @ up to 450 °F	(21 bar g @ up to 232 °C)
TMA	Maximum allowable temperature	450 °F @ 0 - 300 psi g	(232 °C @ 0 - 21 bar g)

Temperature ranges

Code	W		B		G		Y	
Adjustment range	170 °F to 212 °F (76 °C to 100 °C)		145 °F to 195 °F (63 °C to 91 °C)		110 °F to 160 °F (43 °C to 71 °C)		75 °F to 125 °F (24 °C to 52 °C)	
Types	CL-6W	CH-6W	CL-6B	CH-6B	CL-6G	CH-6G	CL-6Y	CH-6Y

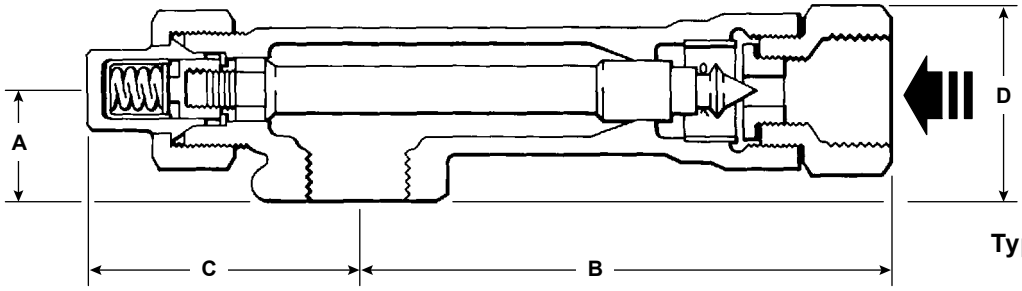
Materials



No.	Part	Material	
1	Body Type C	Cast Iron	ASTM A126 CL B
2	Adjustment Head	Brass	ASTM B124
3	Adjustment Nut	Cast Iron	ASTM A126 CL B
6	Inlet Nut Type C	Steel	AISI 1117
7	Element	Brass &Stainless Steel	
8	Guide Nut	Brass	ASTM B16

No.	Part	Material	
9	Guide Washer	Brass	ASTM B36
10	Adjustment End Plug	Brass	ASTM B62
11	Return Spring	Stainless Steel	AISI 302
12	Valve Head	Stainless Steel	AISI 303
13	Valve Seat	Stainless Steel	AISI 303
14	Seat Gasket Type C	Stainless Steel	AISI 302

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Type CL-6, CH-6

Size and Type	A	B	C	D	E	F	Weight
¾" CL-6/CH-6	1.5 (38)	4.6 (118)	3.7 (94)	2.7 (68)			4.5 lb (2.0 kg)

Capacities

Type	Valve orifice	Maximum operating pressure	Inlet Pressure psi g (bar g)											
			5 (.34)	10 (.68)	25 (1.72)	40 (2.76)	50 (3.45)	75 (5.17)	100 (6.89)	125 (8.62)	150 (10.3)	200 (13.8)	250 (17.2)	300 (20.7)
		psi g (bar g)	Pounds of condensate per hour*											
CL-6	⅜"	125 (8.6)	445	630	1000	1260	1400	1730	2000	2240				
CH-6	5⁄16"	300 (20.7)	310	435	690	870	975	1200	1380	1540	1700	1950	2180	2400

* Capacities for 10 °F (5.5 °C) drop below opening temperature

Sample specification

Liquid expansion steam traps shall contain a solidly liquid-filled thermostatic element, and shall be field-adjustable to discharge condensate at a fixed temperature below 212 °F.

Installation

Thermotons function both as steam trap and simple temperature regulator. Where over temperature due to element failure will cause risk to people or process a failsafe backup safety control should be fitted. The Type C Thermotons should normally be installed with the outlet above the trap. When used to provide freeze protection, install with outlet downwards (as shown above) to be self draining. Discharge temperature change is approximately 25 °F per full turn of the adjustment nut. Allow 1/2 hour between adjustemts.

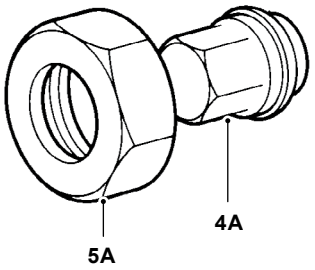
Maintenance

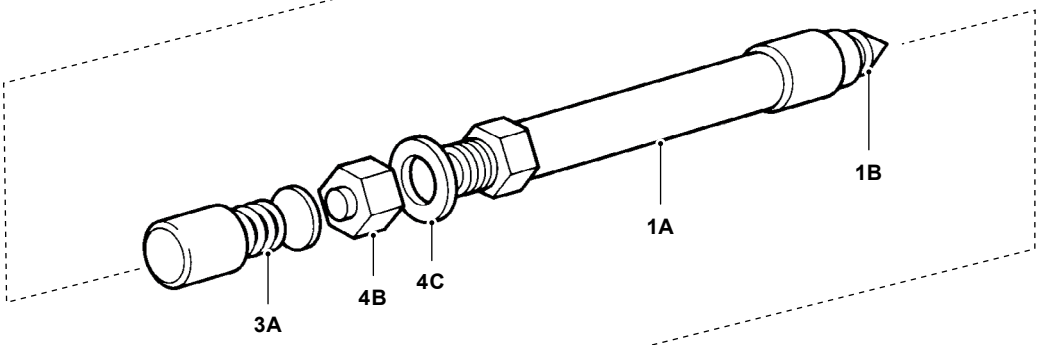
This product can be maintained without disturbing the piping connections. Complete isolation of the trap from both supply and return line is required before any servicing is performed. The trap should be disassembled periodically for inspection and cleaning of the valve head and seat, and operation of the element set. Worn or damaged parts should be replaced using a complete repair kit.
Complete installation and maintenance instructions are given in IMI 2.201, which accompanies the product.

Spare Parts

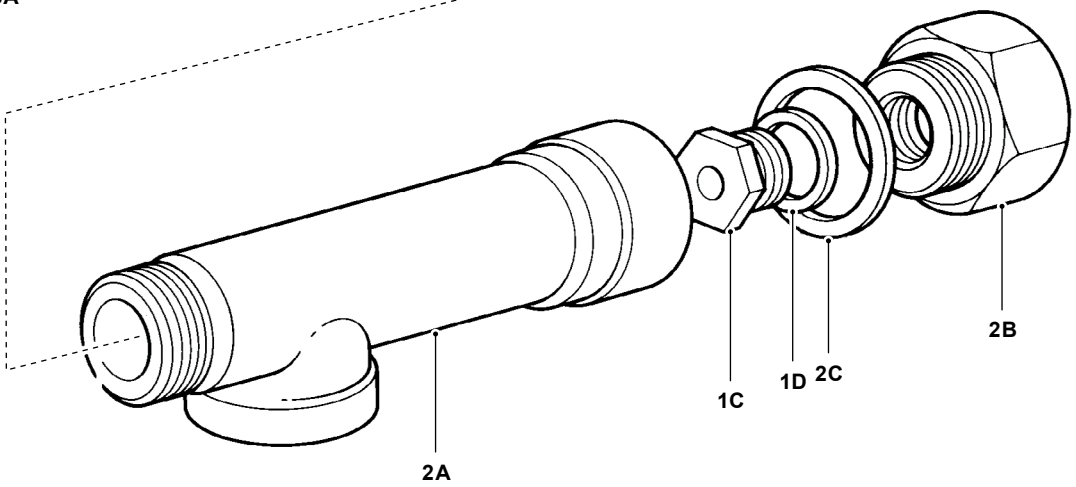
Types C

Part		
1	Element Set (Specify Range)	1A, 1B, 1C, 1D
2	Body Assembly	2A, 2B, 2C
2C	Inlet Nut Gasket	2C
3	Relief Spring	3A
4	Adjustment Head	4A, 4B, 4C
5	Lock Nut	5A





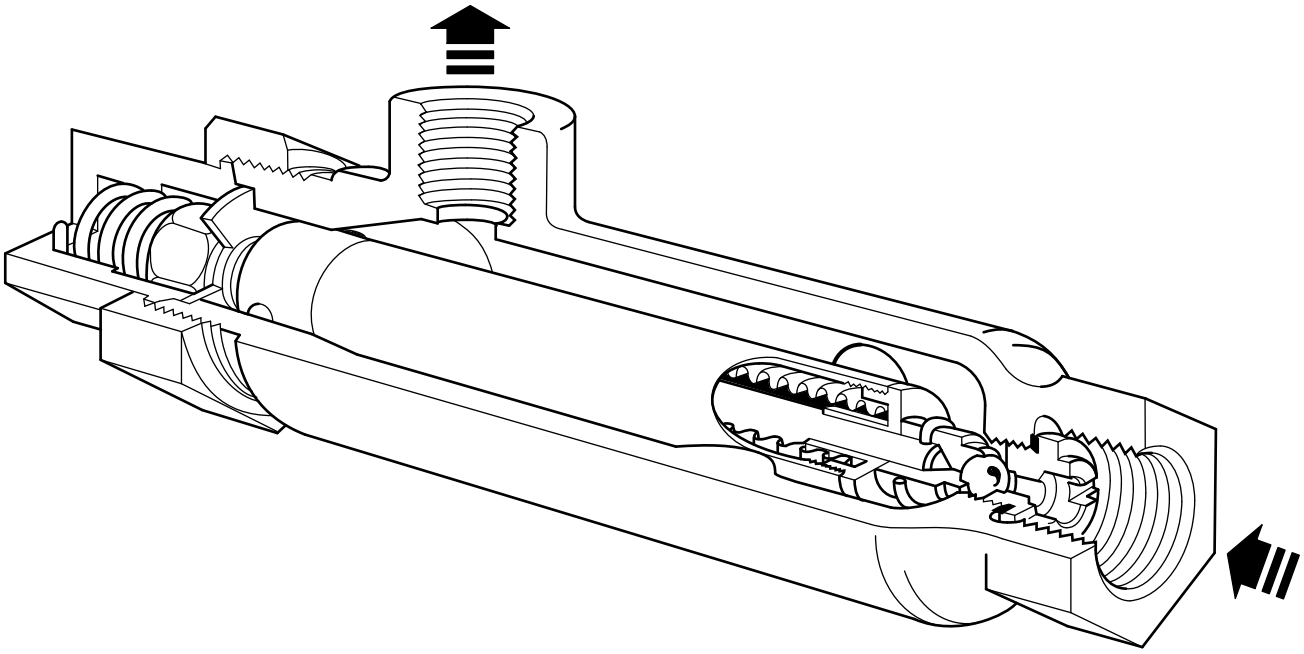
Type C



TI-P018-01
CMGT Issue 5

No.8
Fixed Temperature Liquid Expansion Steam Trap

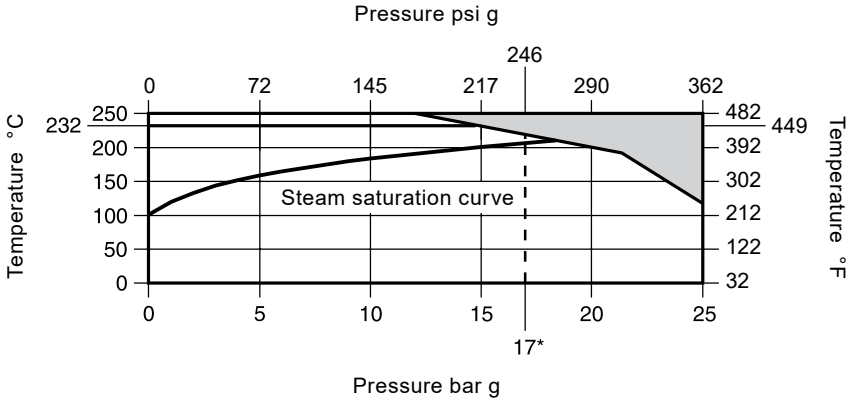
Description
The No.8 fixed temperature liquid expansion thermostatic steam trap has an oil filled element set to operate at a fixed temperature. It is easily adjusted to discharge at any temperature between 60 °C and 100 °C (140 °F and 212 °F).



Sizes and pipe connections
½" screwed BSP or NPT.

Certification
The product is available with certification to EN 10204 2.2.
Note: All certification/inspection requirements must be stated at the time of order placement.

Pressure temperature/limits



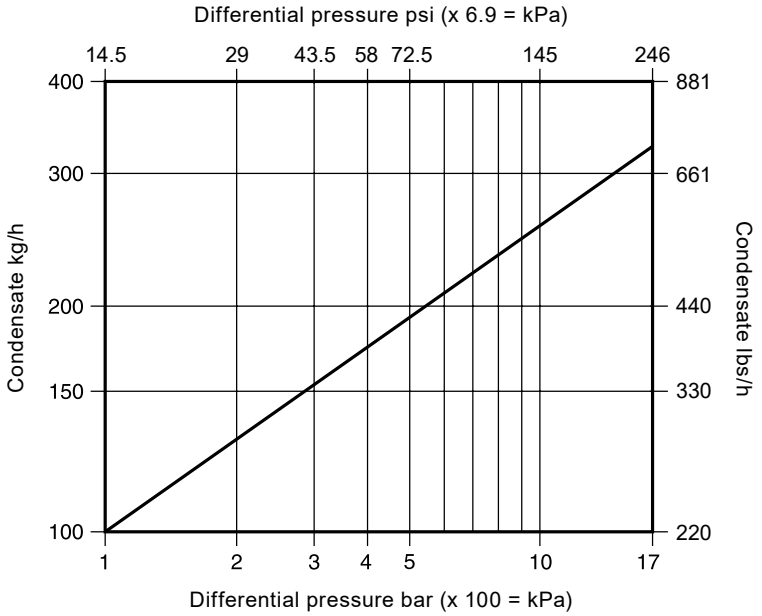
The product **must not** be used in this region.

*PMO Maximum operating pressure recommended for saturated steam (17 bar g) (247 psi g)

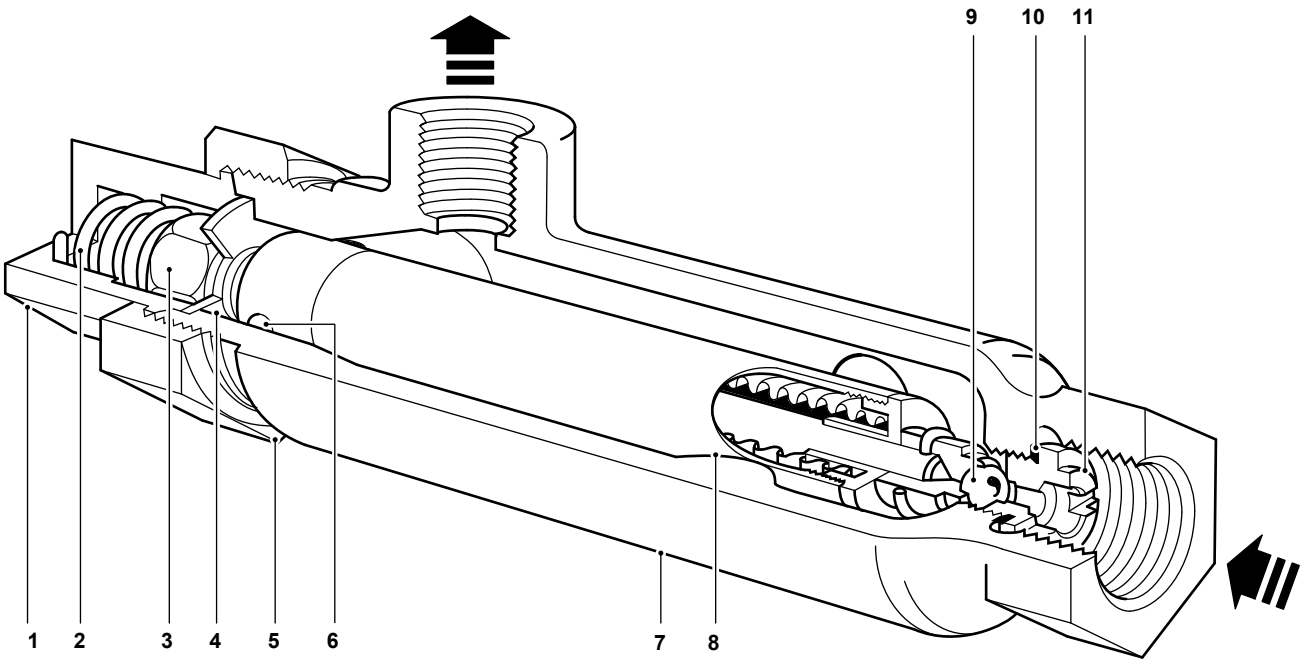
Body design conditions			PN25
PMA	Maximum allowable pressure	25 bar g	363 psi g
TMA	Maximum allowable temperature	250 °C	482 °F
PMO	Maximum operating pressure	17 bar g	247 psi g
TMO	Maximum operating temperature	232 °C	450 °F
Designed for a maximum cold hydraulic test pressure of		38 bar g	551 psi g

Capacities

The capacity graph shown is based on a trap with the adjustment 3 turns open and handling condensate at 80 °C (176 °F).

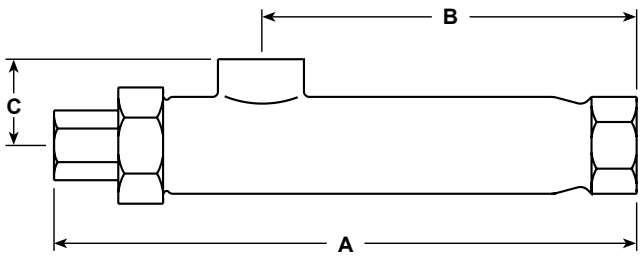


Materials



No.	Part	Material	
1	Adjustment nut	Brass	BS EN 12165 CW 617N
2	Overload spring	Stainless steel	BS 970 302 S31
3	Element nut	Brass	BS EN 12165 CW 617N
4	Washer	Brass	BS 2870 CZ 108
5	Adjustment lock-nut	Brass	BS EN 12165 CW 617N
6	Guide screw	Brass	BS 2872 CZ 108
7	Body	Gunmetal	BS EN CC 491K
8	Element	Brass	
9	Valve head	Stainless steel	AISI 440B
10	Valve seat gasket	Copper	BS 2870 C102
11	Valve seat	Stainless steel	BS 970 431 S29

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	A	B	C	Weight
½"	215 (8.46)	137 (5.39)	32 (1.26)	1.2 (2.6)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P018-02) supplied with the product.
The trap should be installed with the inlet below the equipment being drained. The outlet should always be above the trap.

Adjustment

The position of the valve head relative to the seat and, therefore, the operating temperature, can be altered by turning the adjustment which serves one end of the element.

How to order

Example: 1 off ½" BSP Spirax Sarco No.8 fixed temperature liquid expansion steam trap.

Spare parts

The spare parts available are shown in heavy outline.
Parts drawn in a grey line are not supplied as spares.

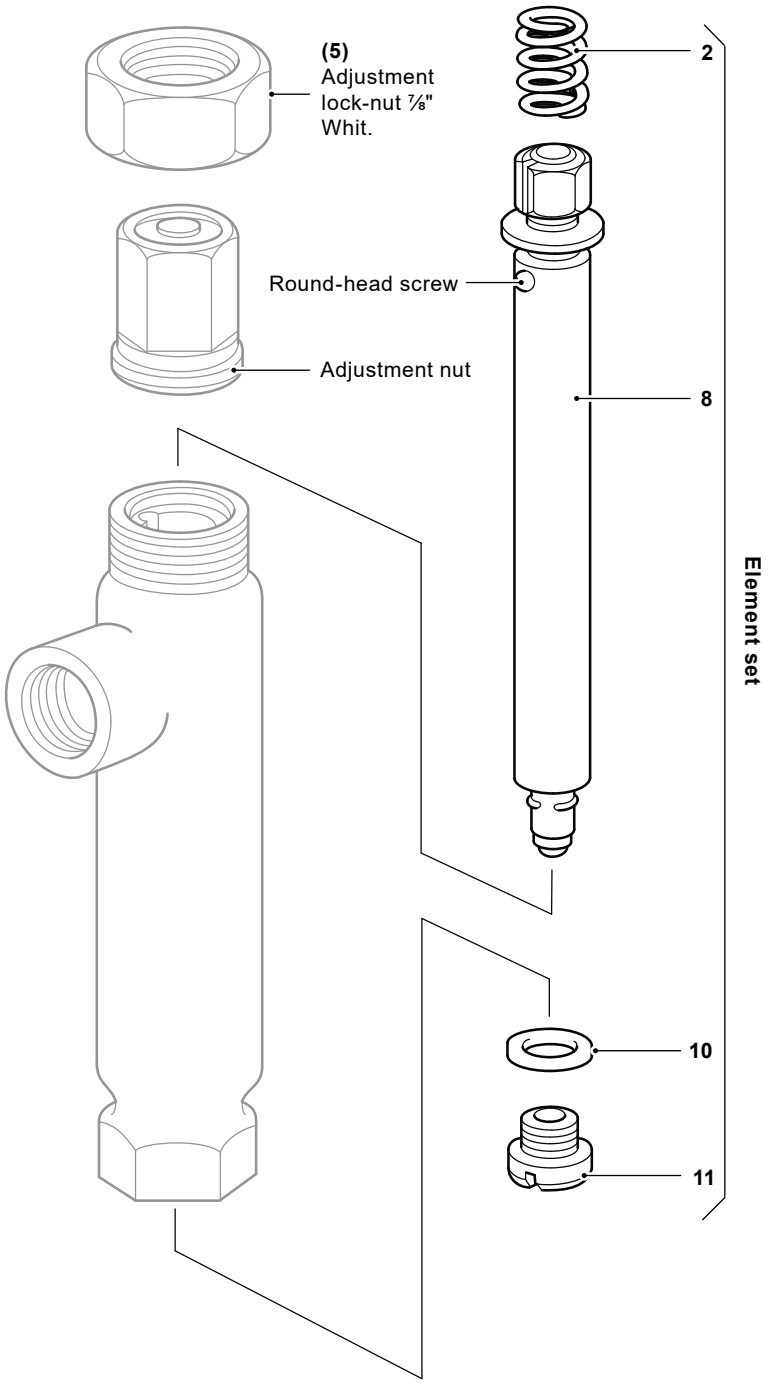
Available spares

Element set	**2, 8, 10, 11**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.

Example: 1 - Element set for a ½" Spirax Sarco No.8 fixed temperature liquid expansion steam trap.



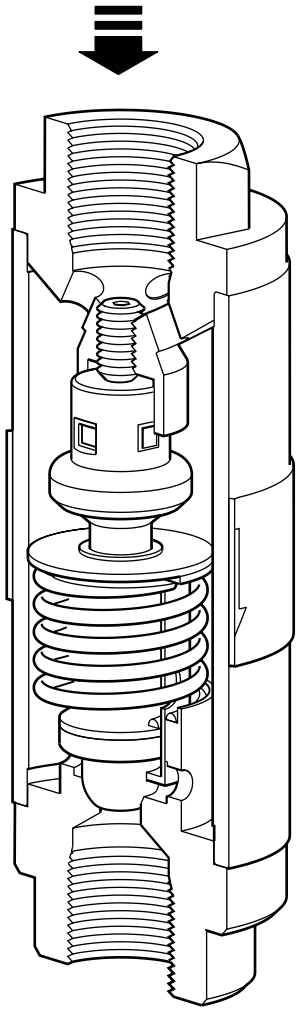
Recommended tightening torques

Item	or mm	N m
5	1 15/32 A/F	80 - 85
11	½" UNF	30 - 35

TI-P670-02
CMGT Issue 4

Bydrain
Frost Protection Liquid Expansion Trap

Description
The Spirax Sarco bydrain frost protection liquid expansion trap is made of stainless steel. It has been specifically designed for protecting water systems from frost damage. This fixed temperature discharge trap continuously monitors the water temperature in the pipes; the trap is firmly closed at 7 °C (45 °F), but as the temperature of the water cools to 2 °C (36 °F) the trap opens, discharging any water in the pipe.



Standards
This product fully complies with the requirements of the Pressure Equipment Directive (PED).

Certification
This product is available with certification to EN 10204 3.1.B.
Note: All certification/inspection requirements must be stated at the time of order placement.

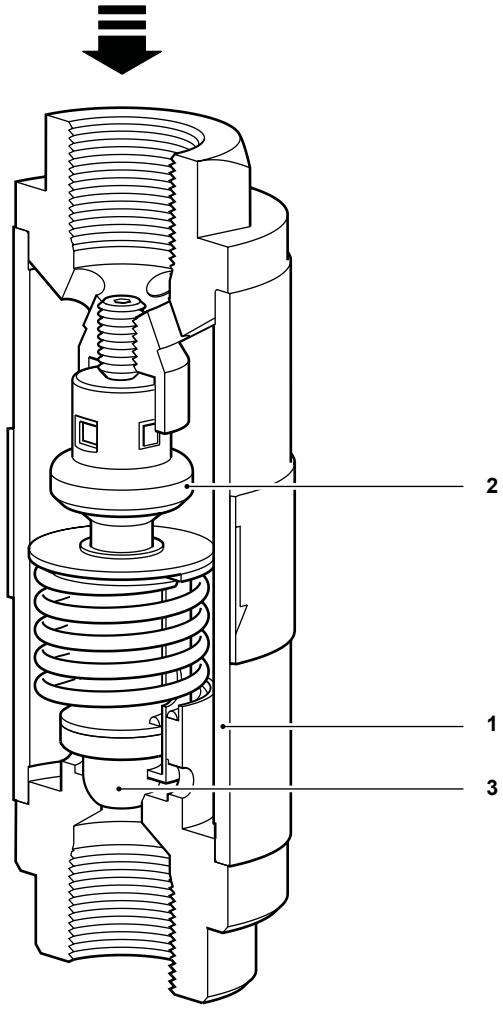
Sizes and pipe connections
½" and ¾" screwed BSP or NPT

Limiting conditions

Body design conditions		PN50, Class 300 to ANSI B 16.34	
PMA	Maximum allowable pressure	41.4 bar g	600 psi g
TMA	Maximum allowable temperature	450 °C	842 °F
PMO	Maximum operating pressure	10 bar g	145 psi g
TMO	Maximum operating temperature	70 °C	158 °F
Minimum operating pressure for satisfactory operation is:		0.1 bar g	1.5 psi g
ΔPMX	The backpressure for correct operation must not exceed 90% of the upstream pressure.		
Designed for a maximum cold hydraulic test pressure of:		62 bar g	899 psi g

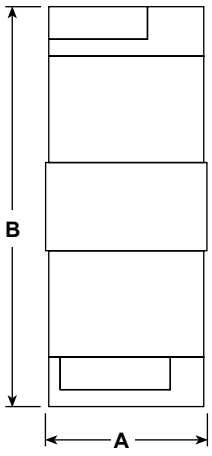
Note: The trap seat is completely open at a water circuit temperature of 2 °C (36 °F) and closed at 7 °C (45 °F).

Materials



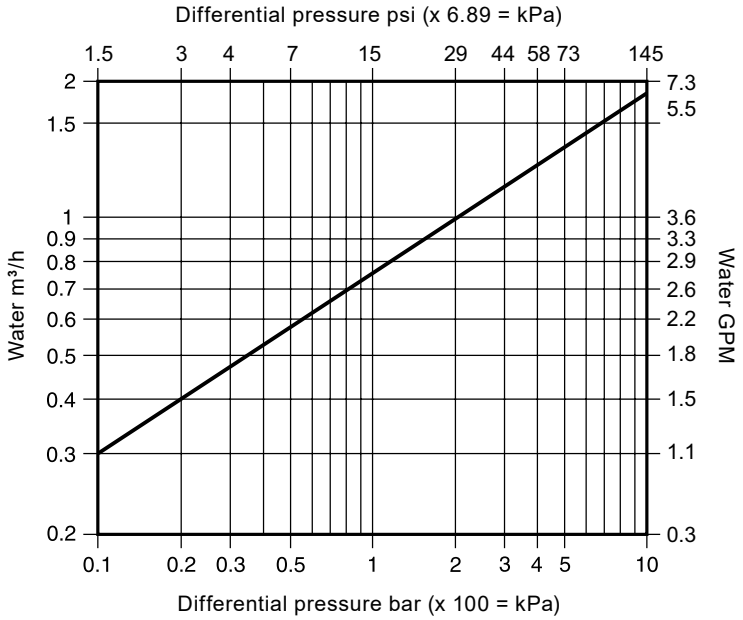
No.	Part	Material	
1	Body	Stainless steel	AISI 316L
2	Thermostat	Brass	
3	Valve head	PTFE	
	Internal parts	Stainless steel	

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	Connections	A	B	Weight
DN15 (½")	BSP, NPT	42.4 (1.7)	110 (4.3)	0.65 (1.4)
DN20 (¾")	BSP, NPT		115 (4.5)	0.70 (1.5)

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P670-01) supplied with the product.

How to order

Example: 1 off Spirax Sarco ½" bydrain frost protection liquid expansion trap with screwed NPT end connections.

TI-P076-10
CMGT Issue 9

SMC32 and SMC32Y Carbon Steel Bimetallic Steam Traps

Description

The SMC32 and SMC32Y are carbon steel maintainable bimetallic steam traps with straight connections. The SMC32 has an integral flat strainer screen and the SM32Y an integral, cylindrical Y-type strainer. All pressure bearing components are produced by TÜV approved suppliers in accordance with AD-Merkblatt WO / TRD 100.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

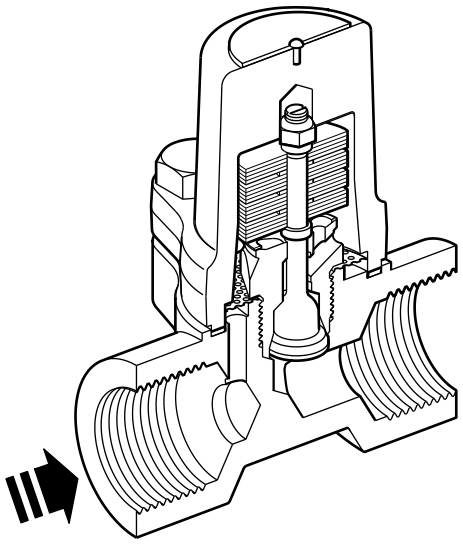
Certification

This product is available with certification to EN 1024 3.1.
Note: All certification / inspection requirements must be stated at the time of order placement.

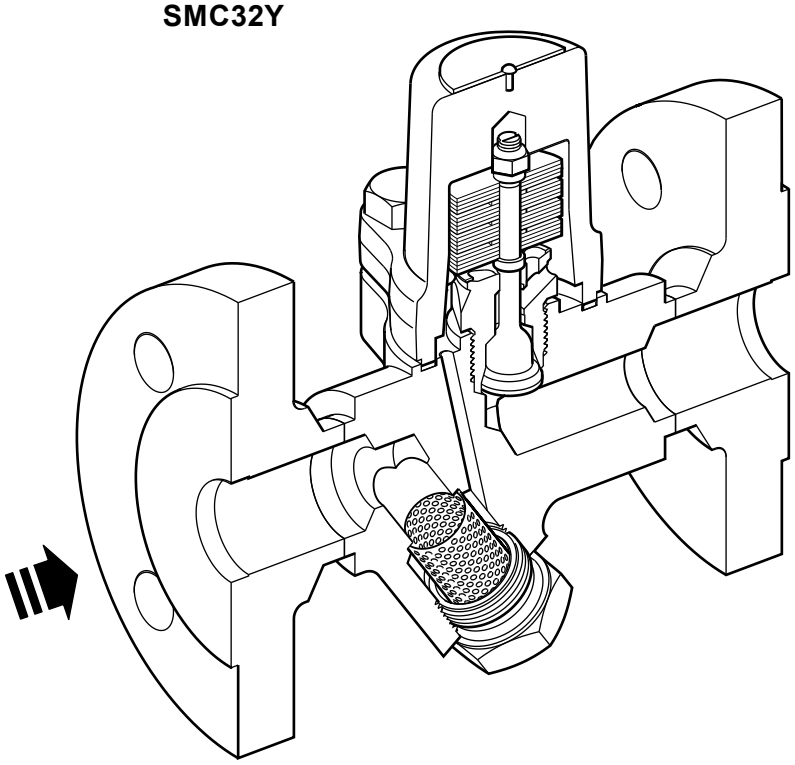
Sizes and pipe connections

½", ¾", and 1" screwed BSP T Rp (ISO 7-1) or NPT.
½", ¾", and 1" socket weld ends to BS 3799.
½", ¾", and 1" butt weld ends to EN 12 627.
DN15, DN20 and DN25 standard flange to EN 1092 PN40, ASME B 16.5 Class 150 and 300, JIS / KS 10K and JIS / KS 20 K.

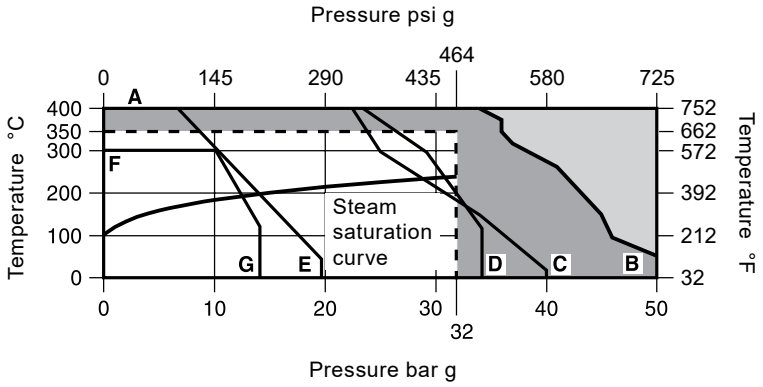
SMC32



SMC32Y



Pressure / temperature limits (ISO 6552)



The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

A - B Screwed, socket weld, butt weld and flanged ASME 300.

A - C Flanged EN 1092 PN40.

A - D Flanged JIS / KS 20K.

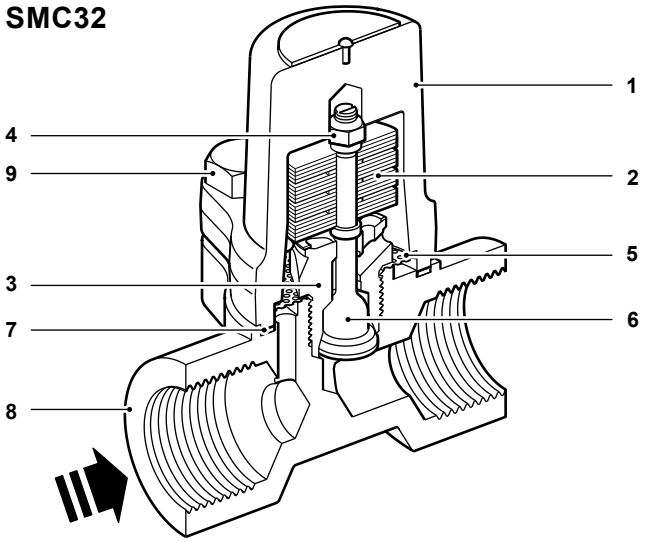
A - E Flanged ASME 150.

F - G Flanged JIS / KS 10K.

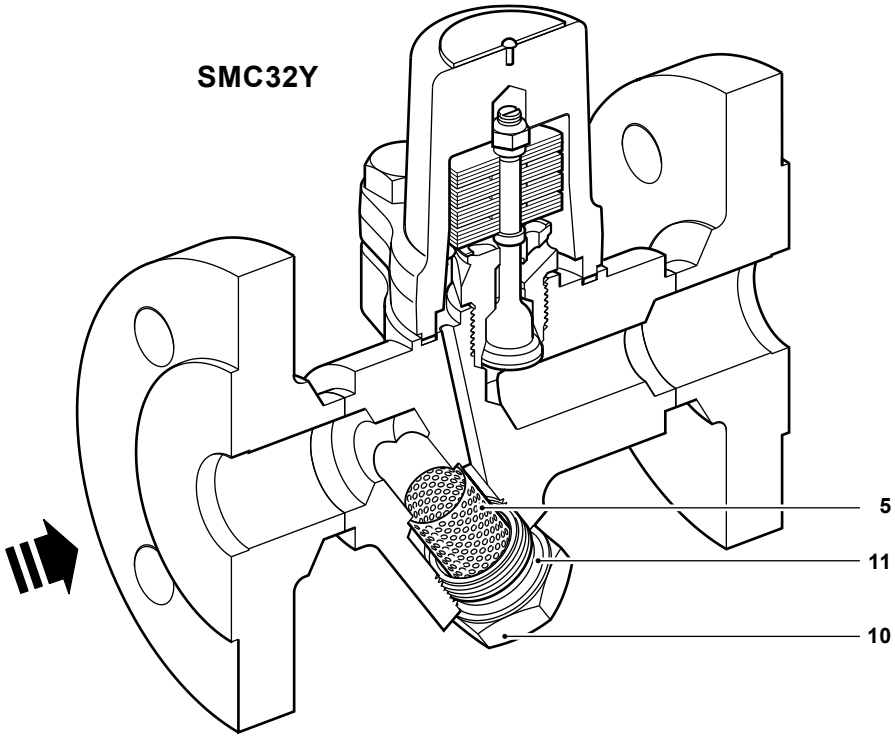
Body design conditions			ASME 300
PMA	Maximum allowable pressure	50 bar g @ 50 °C	725 psi g @ 122 ° F
TMA	Maximum allowable temperature	400 °C @ 35 bar g	752 °F @ 507 psi g
Minimum allowable temperature		-60 °C	-76 °F
PMO	Maximum operating pressure for saturated steam service	32 bar g	464 psi g
TMO	Maximum operating temperature	350 °C @ 32 bar g	662 °F @ 464 psi g
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco		0 °C	32 °F
Product is safe for use under full vacuum conditions			
Designed for a maximum cold hydraulic test pressure of:		75 bar g	1087 psi g

Materials

SMC32

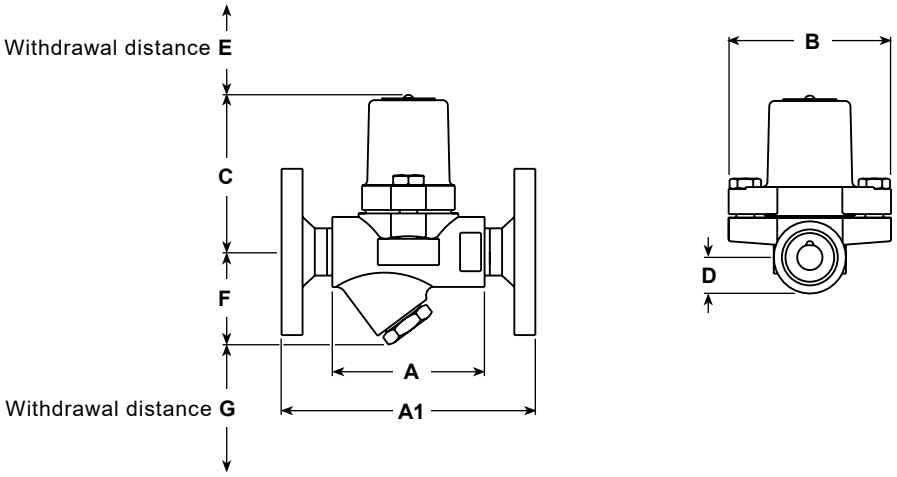


SMC32Y



No.	Part	Material	
1	Cover	Carbon steel	DIN 17243 C22.8 (W/S 1.0460) ASTM A105N
2	Bimetallic element	Corrosion resistant bimetal and stainless steel	Rau Type H46
3	Valve seat	Stainless steel	BS 970 431 S29
4	Locking nut	Stainless steel	
5	Strainer screen	Stainless steel	AIS 304
6	Valve	Stainless steel	
7	Cover gasket	Stainless steel reinforced exfoliated graphite	
8	Body / flanges	Carbon steel	DIN 17243 C22.8 (W/S 1.0460) ASTM A105N
9	Cover bolts	Stainless steel (M10 x 30)	A2 70
10	Strainer cap	Carbon steel	DIN 17243 C22.B (W/S 1.0460) ASTM A105N
11	Strainer cap gasket	Stainless steel	BS 1449 304 S16

Dimensions / weights (approximate) in mm (inches) and kg (lbs)



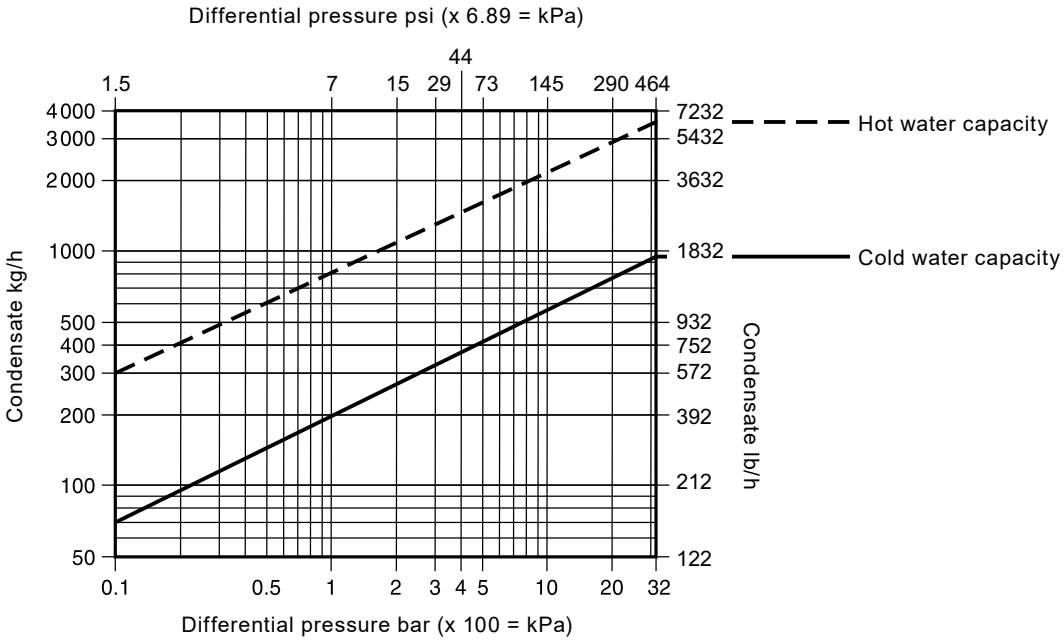
SMC32

Size	A	A1	B	C	D	E	F	G	Weight Scrd/SW/BW	Weight Flgd
½" DN15	95 (3.74)	150 (5.9)	94 (3.7)	92 (3.6)	17 (0.66)	51 (2.0)			1.7 (3.74)	3.1 (6.83)
¾" DN20					19 (0.74)					3.7 (8.15)
1" DN25					23 (0.90)				1.8 (3.96)	4.4 (9.7)

SMC32Y

Size	A	A1	B	C	D	E	F	G	Weight Scrd/SW/BW	Weight Flgd
½" DN15	95 (3.74)	150 (5.9)	94 (3.7)	92 (3.6)		51 (2.0)	54 (2.12)	28 (1.10)	1.7 (3.74)	3.1 (6.83)
¾" DN20										3.7 (8.15)
1" DN25									1.8 (3.96)	4.4 (9.7)

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P076-09) supplied with the product.

Installation note:

The SMC32 and SMC32Y are designed for installation in any position, horizontal or vertical.
It is recommended that a non-return valve is fitted when discharging condensate into return lines where backpressure is experienced.
It is also recommended that a diffuser is fitted when discharging to atmosphere.
Increased backpressure will reduce the temperature of condensate discharge. For further information consult Spirax Sarco.
For ease and maintenance, consideration should be given to fitting isolation valves upstream and downstream of the steam trap.

Disposal

These products are recyclable. No ecological hazard is anticipated with the disposal of these products, providing due care is taken.

How to order

Example: 1 off Spirax Sarco ½" SMC32 carbon steel bodied maintainable bimetallic steam trap with an integral strainer screen and screwed BSP T Rp (ISO 7-1) connections.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

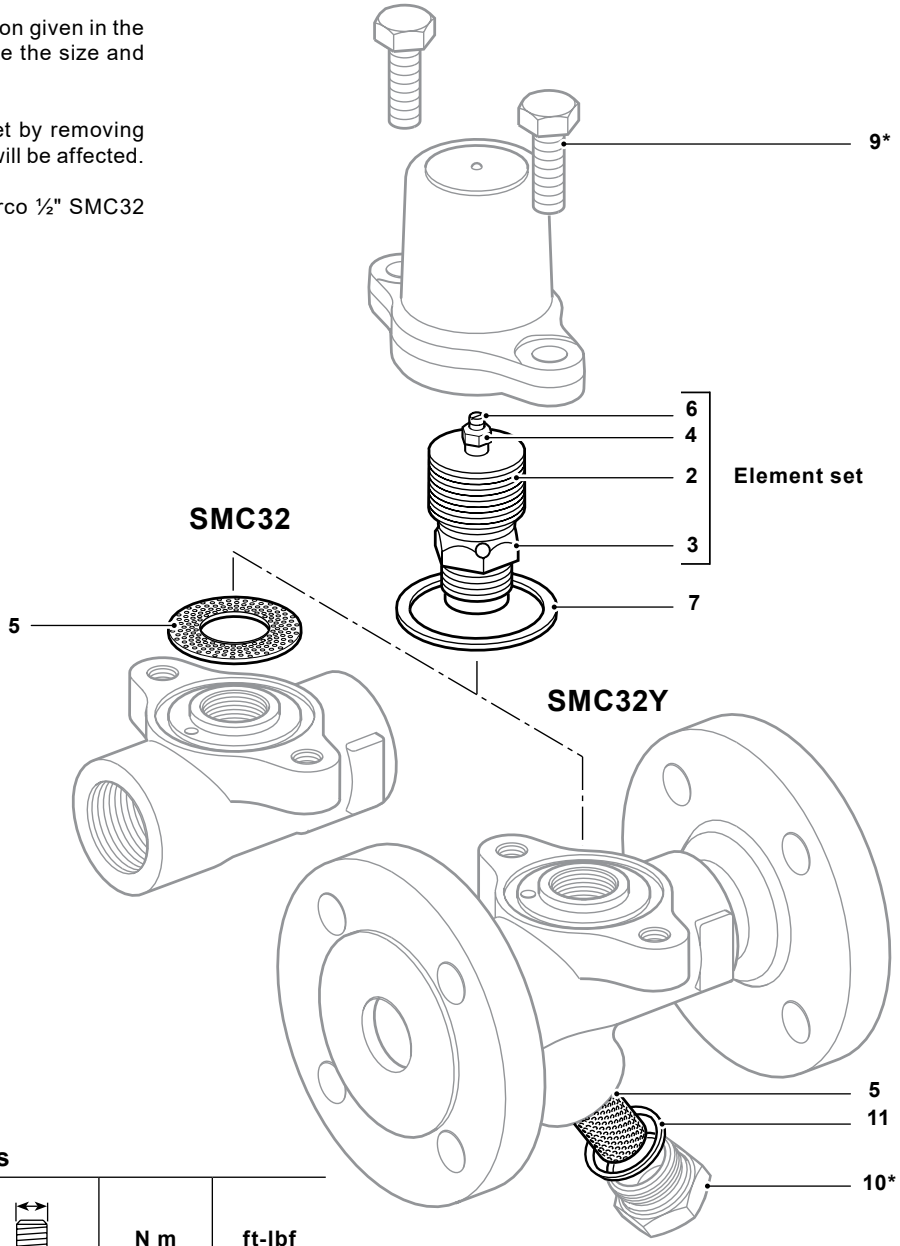
Element set			**2, 3, 4, 6**
Strainer screen	SMC32	(3 off)	**5**
Strainer screen and gasket	SMC32Y	(1 off)	**5, 11**
Set of cover gaskets		(packet of 3)	**7**
Strainer cap gasket		(packet of 3)	**11**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of trap.

Warning: Do not dismantle the element set by removing the locking nut (**4**) or the setting of the trap will be affected.

Example: 1 - Element set for a Spirax Sarco ½" SMC32 bimetallic steam trap.



Recommended tightening torques

Item	Part	or mm		N m	ft-lbf
3	Valve seat	24 A/F		115 - 125	85-92
9	Cover bolts	16 A/F	10 x 30	23 - 27	17-20
10	Strainer cap	27 A/F		120 - 135	89-100

***Note:** Items **9** and **10** are not available as spares.

TI-P623-02
CMGT Issue 10

HP45
Bimetallic Steam Trap

Description
The Spirax Sarco HP45 bimetallic steam trap is made of forged steel, and designed for draining high pressure, high temperature steam lines and processes.

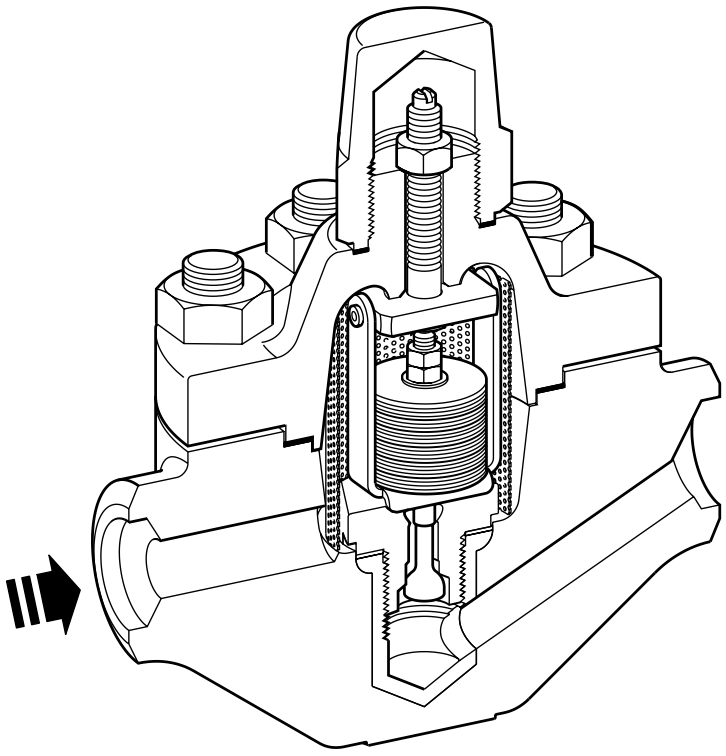
This steam trap is specially designed for HP steam and has a reinforced stainless steel insert within the body and can be repaired inline. It operates with no loss of steam, and quickly drains air, non-condensable gases and large quantities of cold water on start-up.

Normally open in the event of failure, it has a built-in strainer screen and an external device for adjusting the discharge temperature of the condensate.

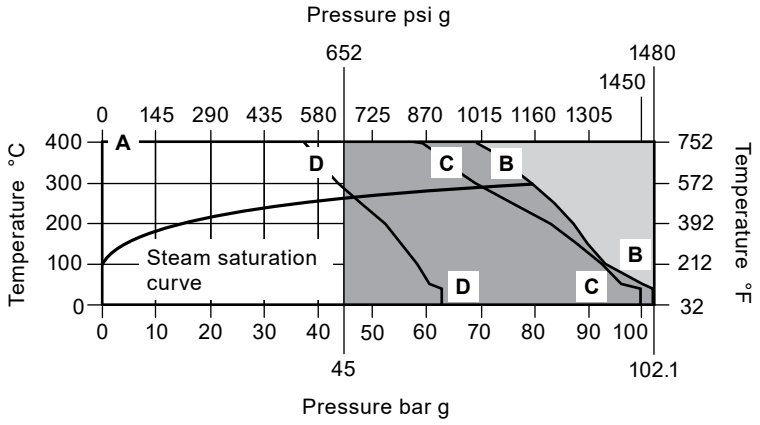
Standards
This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

Certification
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections
½", ¾" and 1" screwed BSP T Rp (ISO 7-1)/NPT, socket weld ends to ANSI B 16.11 and butt weld ends to ANSI B 16.25.
DN15, DN20 and DN25 Flanged PN63, PN100 and ANSI 600.



Pressure/temperature limits



A-B-B Flanged Class 600, Screwed BSP/NPT, Socket weld and butt weld ends

A-C-C Flanged PN100

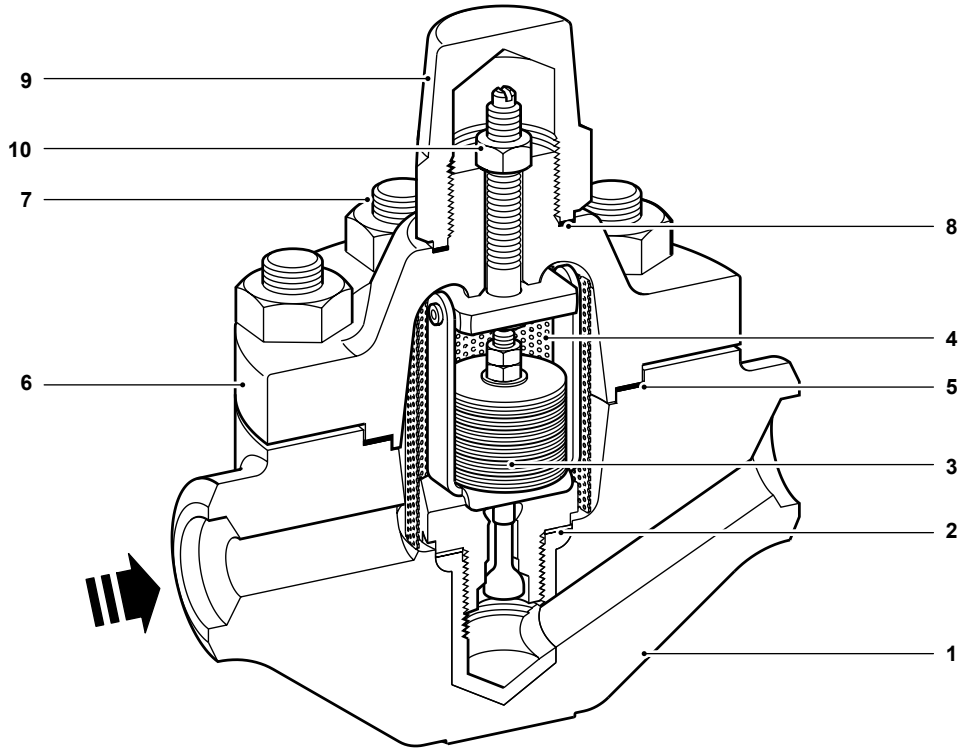
A-D-D Flanged PN63

The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

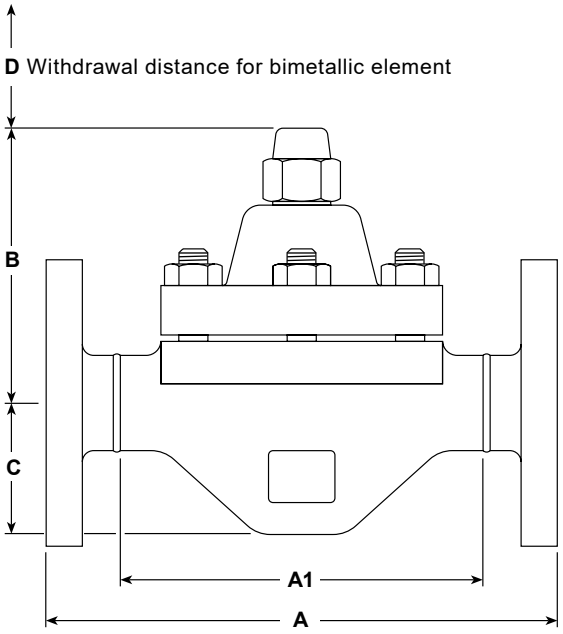
Body design conditions			Class 600 to ANSI B 16.34
PMA	Maximum allowable pressure	102 bar g @ 38 °C	1479 psi g @ 100 °F
TMA	Maximum allowable temperature	425 °C @ 57.5 bar g	797 °F @ 833 psi g
Minimum allowable temperature		0 °C	32 °F
PMO	Maximum operating pressure	45 bar g @ 425 °C	653 psi g @ 797 °F
TMO	Maximum operating temperature	425 °C @ 45 bar g	797 °F @ 653 psi g
Minimum operating temperature **Note:** For lower temperatures consult Spirax Sarco.		0 °C	32 °F
Minimum inlet pressure for satisfactory operation		15 bar g	218 psi g
ΔPMX	The backpressure for correct operation must not exceed 90% of the upstream pressure.		
Product is safe for use under full vacuum conditions			
Designed for a maximum cold hydraulic test pressure of:		166 bar g	2407 psi g

Materials



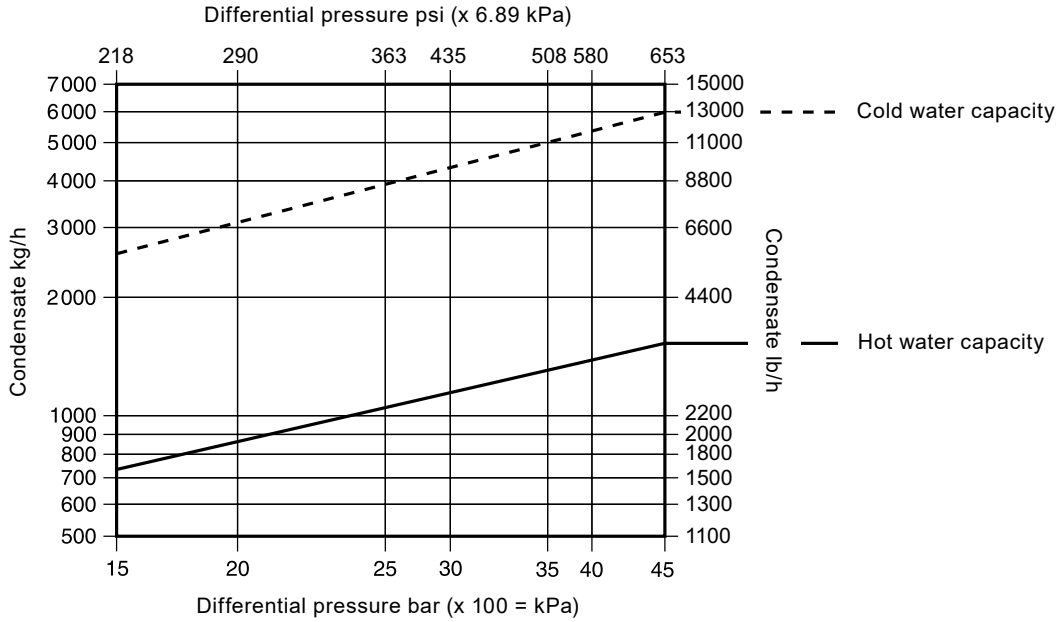
No.	Part	Material	
1	Body	Steel	ASTM A105N
2	Valve seat gasket	Stainless steel	AISI 304
3	Bimetallic element	Stainless steel	
4	Strainer screen	Stainless steel	AISI 304L
5	Cover gasket	Spiral wound stainless steel and graphite (asbestos free)	
6	Cover	Steel	ASTM A105N
7	Cover stud	Steel	ASTM A193 Gr. B7
	Cover nut	Steel	ASTM A194 Gr. 2H
8	Blind nut gasket	Stainless steel tanged reinforced graphite	
9	Blind nut	Steel	ASTM A105
10	Lock-nut	Steel	

Dimensions/weights (approximate) in mm (inches) and kg (pounds)



Size		A	A1	B	C	D	Weight
½" ¾" 1"			160 (6.3)	124 (4.9)	58 (2.3)	150 (5.9)	6.5 (14)
DN15	PN63/PN100	235 (9.3)					11.0 (24)
	ANSI 600						9.5 (21)
DN20	PN63/PN100						11.5 (25)
	ANSI 600						10.0 (22)
DN25	PN63/PN100						12.0 (26)
	ANSI 600						10.5 (23)

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P623-03) supplied with the product.

Disposal

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

How to order

Example: 1 off Spirax Sarco ½" HP45 bimetallic steam trap with socket weld end connections.

Spare parts

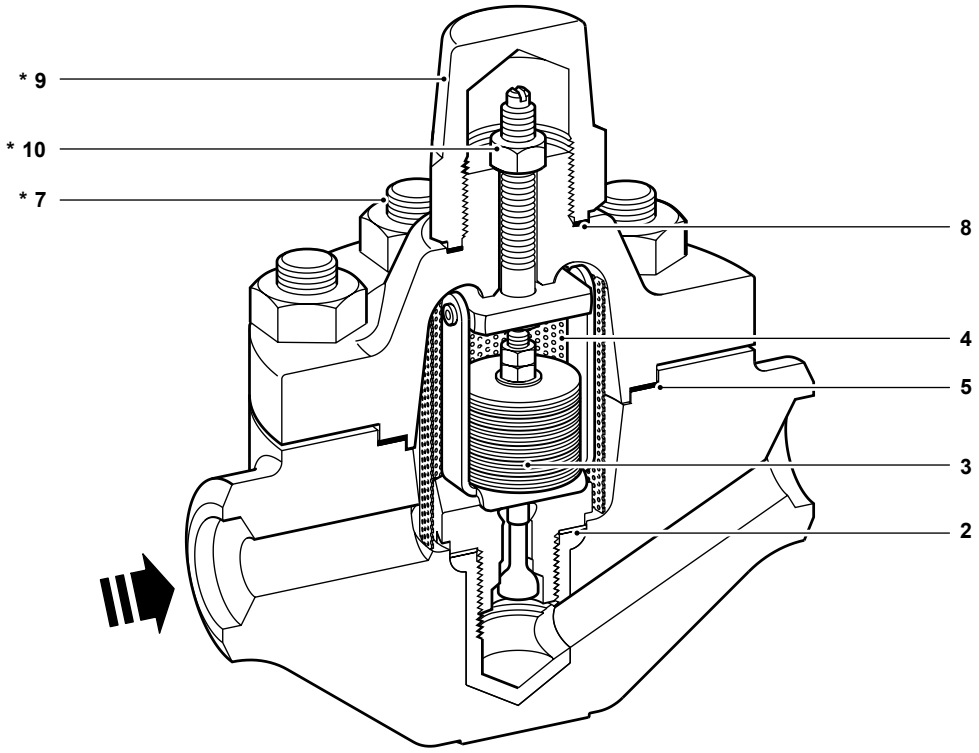
The spare parts available are detailed below. No other parts are supplied as spares.

Available spare

Bimetallic assembly kit	**2, 3, 4, 5, 8**
Cover gasket (pack of 3)	**5**
Gasket set	**2, 5, 8**
Strainer screen	**4**

How to order spares

Always order spares by using the description given in the column headed 'Available spare' and state the size and model of the bimetallic steam trap.
Example: 1 - Bimetallic assembly kit for a Spirax Sarco 1" HP45 bimetallic steam trap.



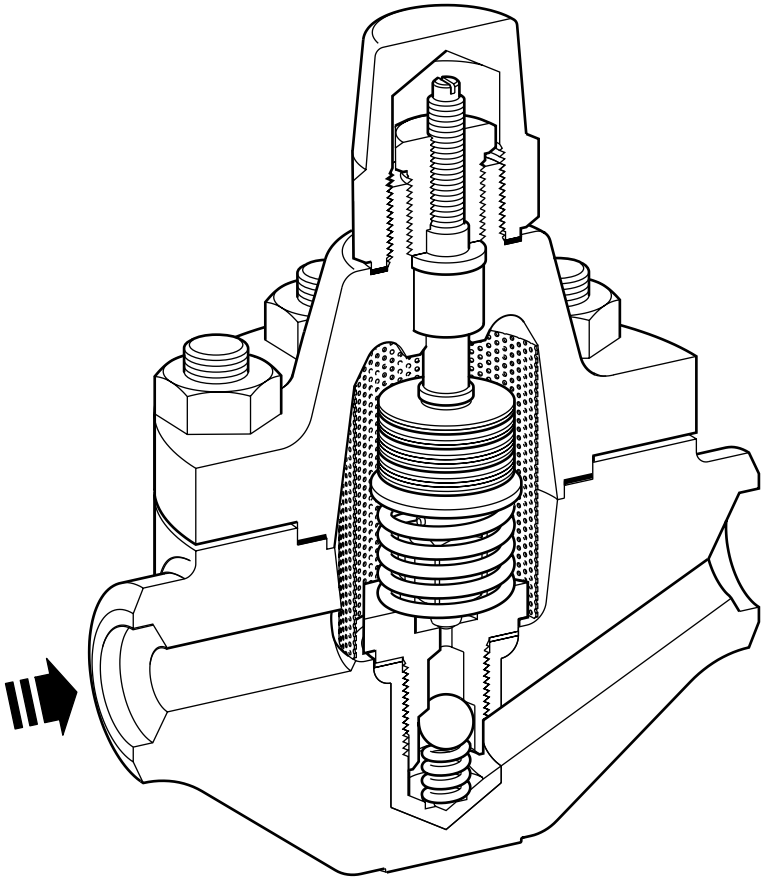
*** Items 7, 9 and 10 are not available spares.**

Recommended tightening torques

Item	or mm	N m	ft lbf
3	36 A/F	120 - 132	89 - 96
7	22 A/F	70 - 77	52 - 57
9	29 A/F	80 - 88	59 - 65
10	13 A/F	5	4

TI-P071-01
CMGT Issue 5

HP70 Series
Bimetallic Steam Trap



Description

The Spirax Sarco HP70 bimetallic steam trap is made of a forged alloy steel, and designed for draining high pressure, high temperature steam lines and processes. This steam trap, which is specially designed for HP steam, has a reinforced stainless steel insert within the body and can be repaired inline. It operates with no loss of steam, and quickly drains air, non-condensable gases and large quantities of cold water on start-up.
Normally open in the event of failure, it has a check valve, a built-in strainer screen and an external device for adjusting the discharge temperature of the condensate.

Standards

This product fully complies with the requirements of the Pressure Equipment Directive 2014/68/EU.

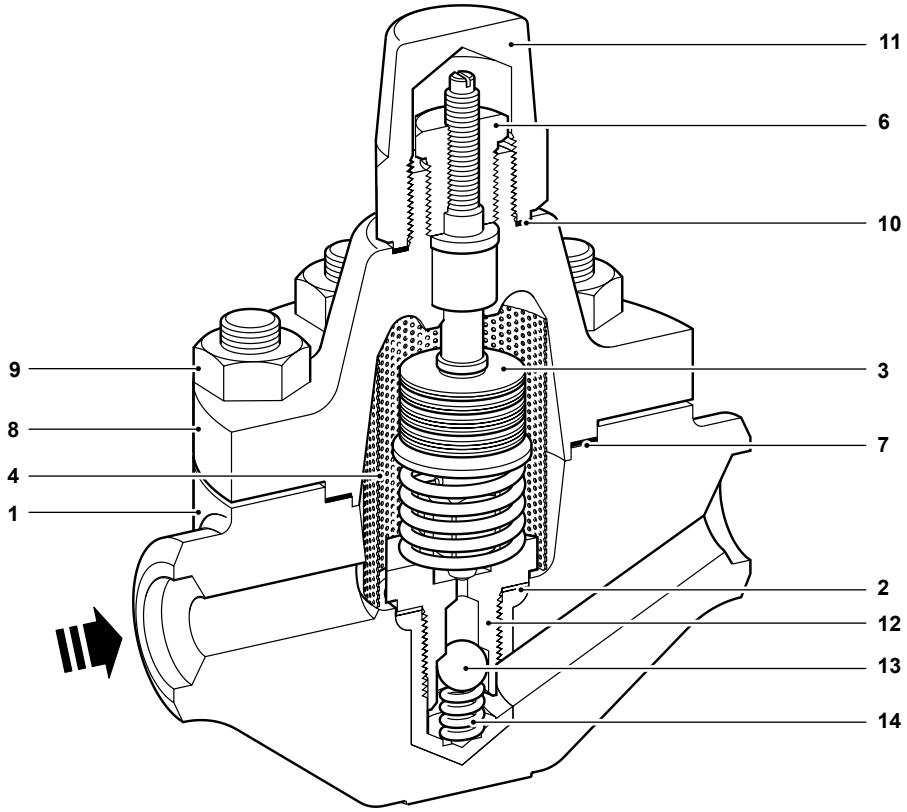
Certification

This product is available with certification to EN 10204 3.1
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

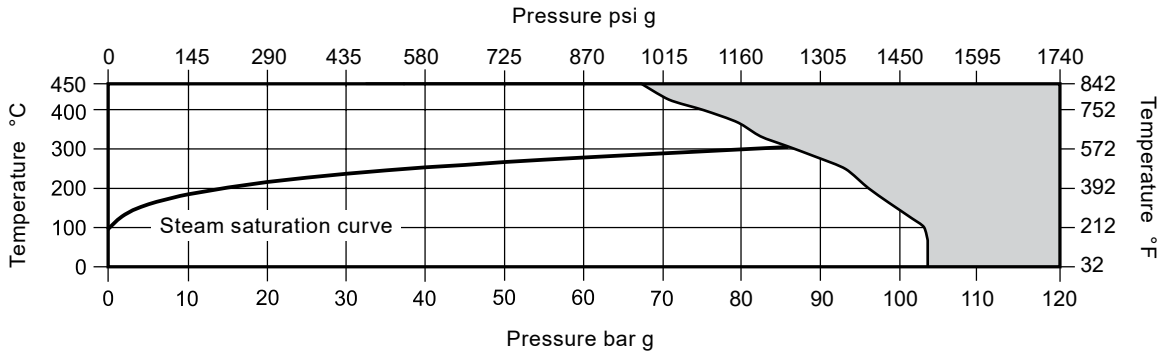
½", ¾" and 1"	Socket weld to ASME B 16.11 **or** Butt weld to ASME B 16.25.

Materials



No.	Part	Material	
1	Body	Alloy steel	ASTM A182 F11
2	Valve seat gasket	Stainless steel	Z6 CN 18-09
3	Bimetallic element	Stainless steel	
4	Strainer screen	Stainless steel	AISI 304L
5	Gland packing	Graphite (asbestos-free)	
6	Locking gland nut	Stainless steel	Z10 CNF 18-09
7	Cover gasket	Spiral wound stainless steel and graphite (asbestos-free)	
8	Cover	Alloy steel	ASTM A182 F11
9	Cover stud	Steel	ASTM A193 Gr. B7
	Cover nut	Steel	ASTM A194 Gr. 2H
10	Blind nut gasket	Metal, stainless steel/graphite	
11	Blind nut	Steel	ASTM A105
12	Valve seat	Stainless steel	BS.970 431 29 & ASTM A276 431
13	Check valve	Stainless steel	BS.970 304S11
14	Check valve spring	Nickel-Chromium-Cobalt	NIMONIC 90

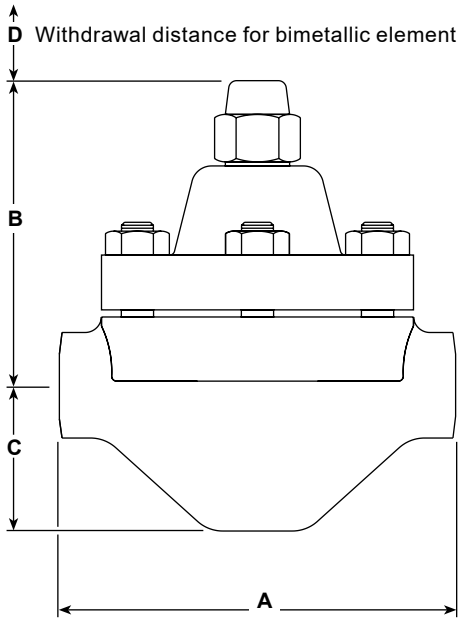
Pressure/temperature limits



The product **must not** be used in this region.

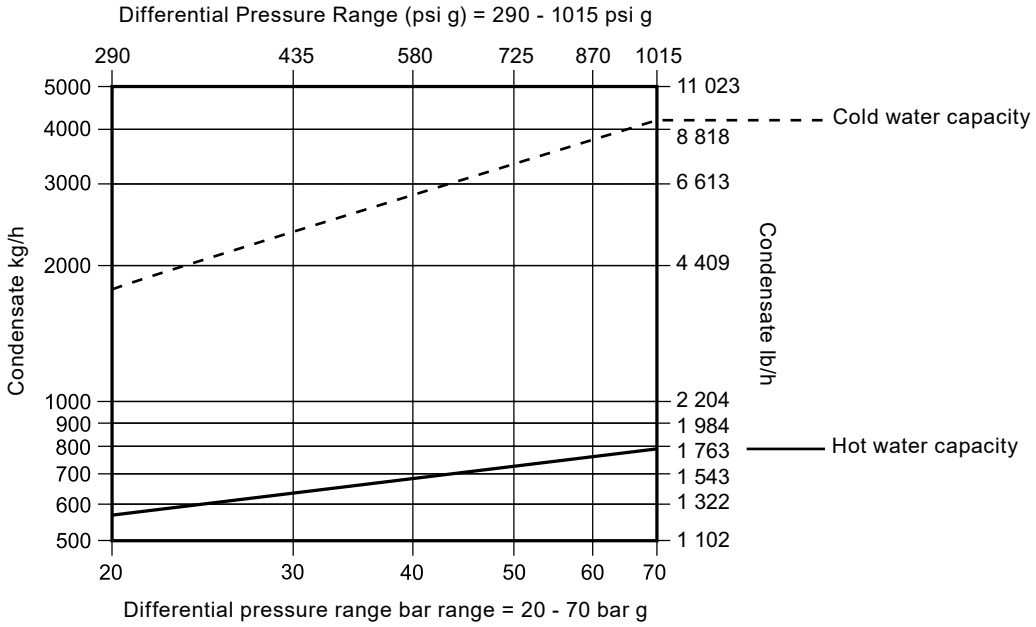
Body design condition			Class 600
PMA	Maximum allowable pressure	103.4 bar g @ 50 °C	1500 psi g @ 122 °F
TMA	Maximum allowable temperature	450 °C @ 67.7 bar g	842 °F @ 982 psi g
PMO	Maximum operating pressure	70 bar g @ 425 °C	1015 psi g @ 797 °F
TMO	Maximum operating temperature	425 °C @ 70 bar g	797 °F @ 1015 psi g
Minimum allowable temperature		-14 °C	6.8 °F
Minimum inlet pressure for satisfactory operation is:		20 bar g	290 psi g
Minimum operating temperature		0 °C	32 °F
ΔPMX	The backpressure for correct operation must not exceed 90% of the upstream pressure		
Designed for a maximum cold hydraulic test pressure of:		156 bar g	2262 psi g

Dimensions/weights (approximately) in mm (inches) and kg (lbs)



A	B	C	D	Weight
160 (6.3)	145 (5.7)	58 (2.3)	150 (5.9)	10.5 (23.1)

Capacities



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

How to order

Example: 1 off Spirax Sarco ½" HP70 bimetallic steam trap with socket weld end connections.

Spare parts

The spare parts available are detailed below. No other parts are supplied as spares.

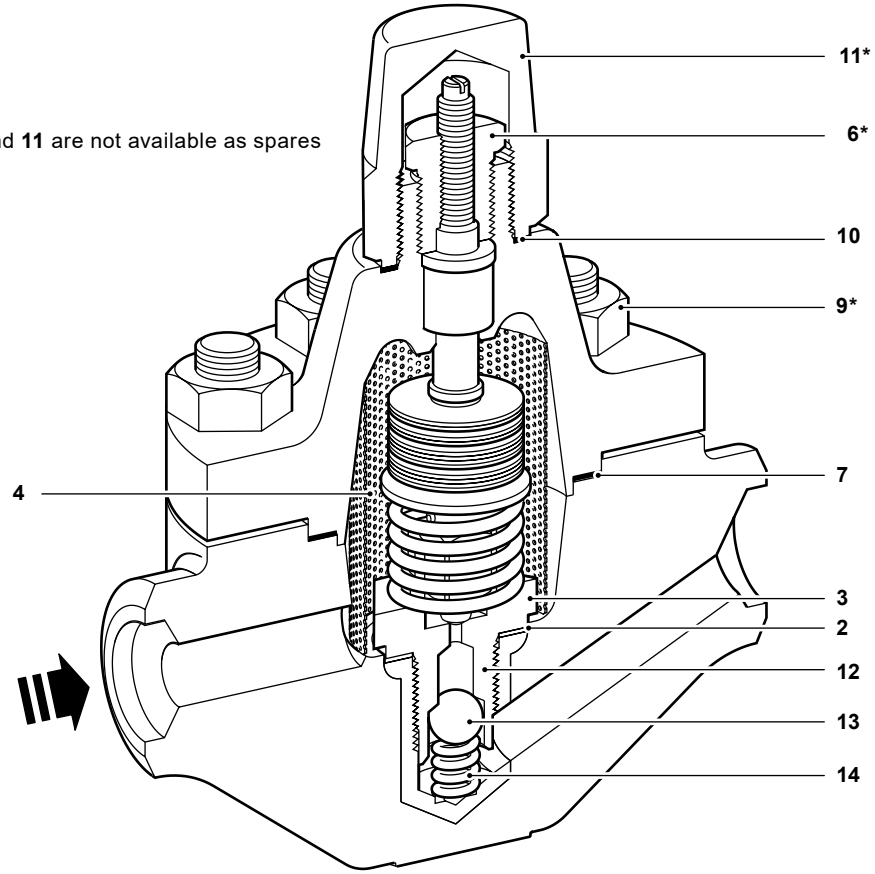
Available spares	
Bimetallic assembly kit	**2, 3, 4, 7, 10, 12**
Strainer screen	**4**
Cover gasket set (packet of 3)	**7**
Gasket set	**2, 7, 10**
Check valve assembly	**13, 14**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and model of the bimetallic steam trap.

Example: 1 - Bimetallic assembly kit for a Spirax Sarco 1" HP70 bimetallic steam trap.

* **Note:** Items **6, 9** and **11** are not available as spares



Recommended tightening torques

Item	or mm	N m	ft lbf
3	36 A/F	120	89
6	21 A/F	38	28
9	24 A/F	105	77
11	41 A/F	80	59

TI-P086-17
EMM Issue 3

Spiratec
ST14, ST16 and ST17
Sensor Chambers and Sensors

Spiratec sensor chamber description

The Spiratec trap fault detection system is designed to operate on saturated steam systems only, to indicate whether a steam trap is leaking steam. When combined with the R1C or R16C automatic trap monitor and WLS1 waterlogging sensor assembly, it will detect if a steam trap has failed closed or is blocked.
As standard - The sensor chamber has the sensor connection on the right hand side of the chamber when viewed from the direction of flow. If required - Chambers can be supplied with the sensor connections on the left hand side 'L', but must be requested when placing an order, i.e. ½" ST141L.

Chambers are available in two configurations:

1. Fitted with an SS1 standard sensor for steam leak detection only.
2. Without a sensor fitted. A WLS1 waterlogging sensor assembly is available separately for steam leak and waterlogging applications.

Spiratec sensor description

Spiratec sensors are designed to fit into Spiratec sensor chambers as part of the Spiratec trap fault detection system.

Available types:

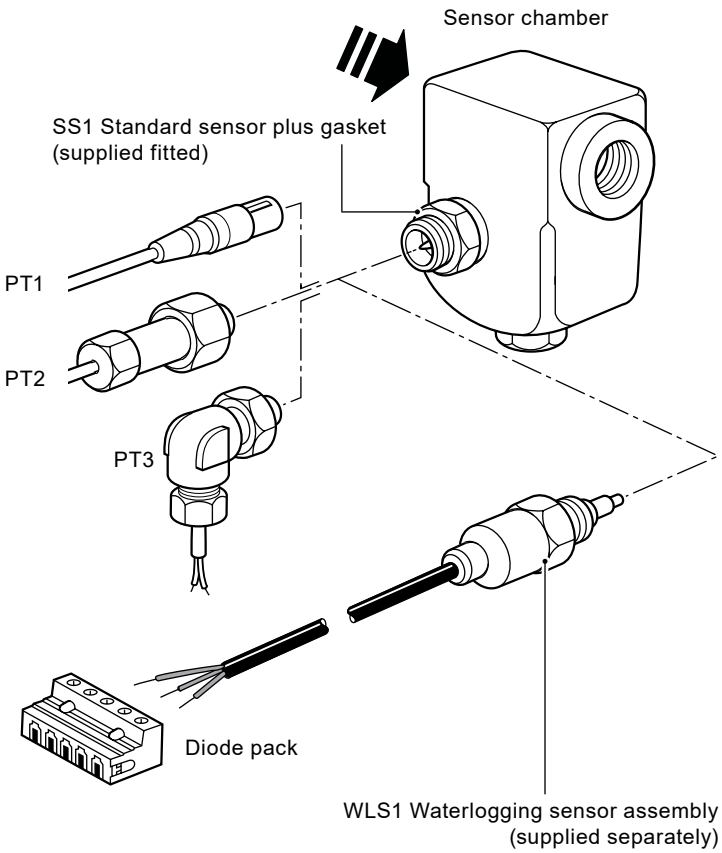
SS1 standard sensor: For the detection of steam leaks when used in conjunction with a sensor chamber and a Type 30 or Type 40 hand held indicator, R1C or R16C automatic trap monitor.
SS1's are normally supplied already fitted into the sensor chamber.

WLS1 waterlogging sensor assembly: For the detection of steam leaks or traps that have failed closed or are blocked when used in conjunction with an R1C or R16C automatic trap monitor. WLS1's are normally supplied as separate items for fitting into a sensor chamber on site.

Note: sensor chambers without sensors are available from stock.

Optional extras

A sensor blanking plug is available at extra cost, to protect the external connection of the SS1 standard sensor chamber from dirt.



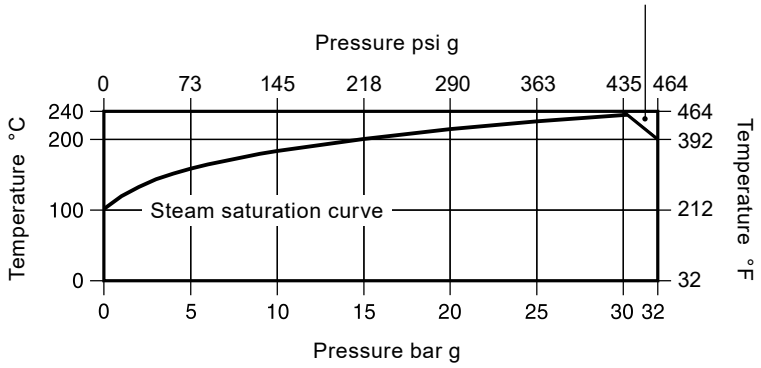
Sensor chambers and sensor - Available types, sizes and pipe connections

	Type	Body material	Connection	DN15 ½"	DN20 ¾"	DN25 1"	DN40 1½"	DN50 2"
Spiratec sensor chamber	**ST141**	Steel body	Screwed BSP or NPT	•	•	•	•	•
	ST142	Steel body	Socket weld ends to BS 3799	•	•	•	•	•
	ST143	Steel body	Flanged EN 1092 PN40, ANSI 150, ANSI 300, BS 10 Table H and Table J	•	•	•	•	•
	ST161	Stainless steel body	Screwed BSP or NPT	•	•	•	-	-
	ST162	Stainless steel body	Socket weld ends to BS 3799	•	•	•	-	-
	ST163	Stainless steel body	Flanged EN 1092 PN40, ANSI 150, ANSI 300, BS 10 Table H and Table J **Note:** JIS 20 connections are available on request.	•	•	•	-	-
	ST171	SG iron body	Screwed BSP or NPT	•	•	•	-	-
Spiratec sensor	**SS1**	The SS1 standard sensor is threaded ⅜" parallel BSP for assembly into the Spiratec sensor chamber. An external screw thread (M22 x 1.5) is provided to allow permanent installation using the PT2 or PT3 connector. **Three standard types of connector are available for use with the SS1 standard sensor:**						
Spiratec sensor connections	**WLS1**	Waterlogging sensor assembly is supplied complete with 1 m (3.28 ft) of high temperature three core cable for connection to an R1C automatic trap monitor. It can also be connected to an R16C automatic trap monitor using a special diode pack.						
	PT1	A plug in connector for use with SS1 standard sensors. Supplied with Type 30 or Type 40 hand held indicators complete with 1 m (3.28 ft) of high temperature cable and male plug.						
	PT2	A threaded in-line connector for use with SS1 standard sensors for permanent installations for use with the R1C or R16C automatic trap monitors (non waterlogging applications only).						
	PT3	A right angled connector for use with SS1 standard sensors for permanent installations for use with R1C or R16C automatic trap monitors (non waterlogging applications only).						

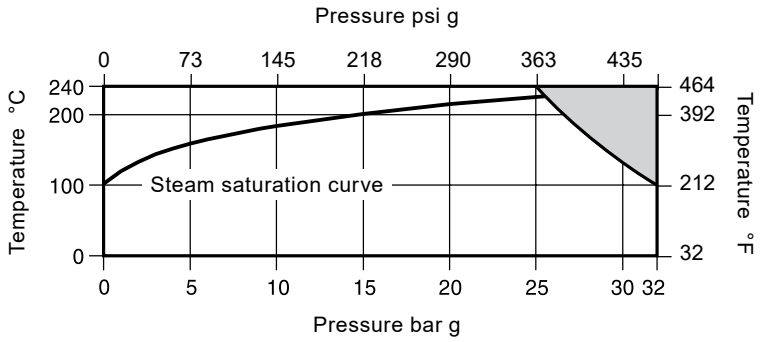
Pressure/temperature limits

* CRN approved ST14 DN40 and DN50 units must not be used in this region.

ST14

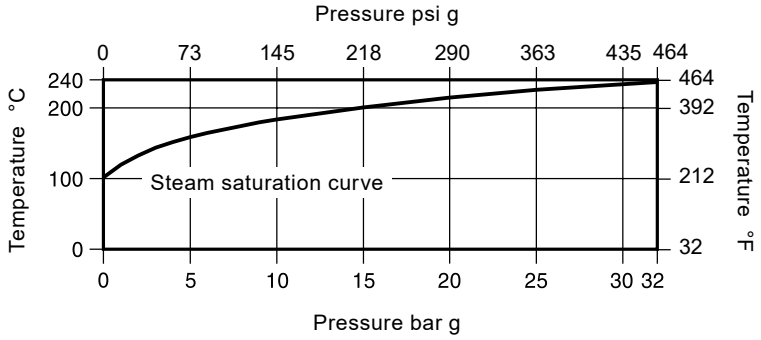


ST16



The product **must not** be used in this region.

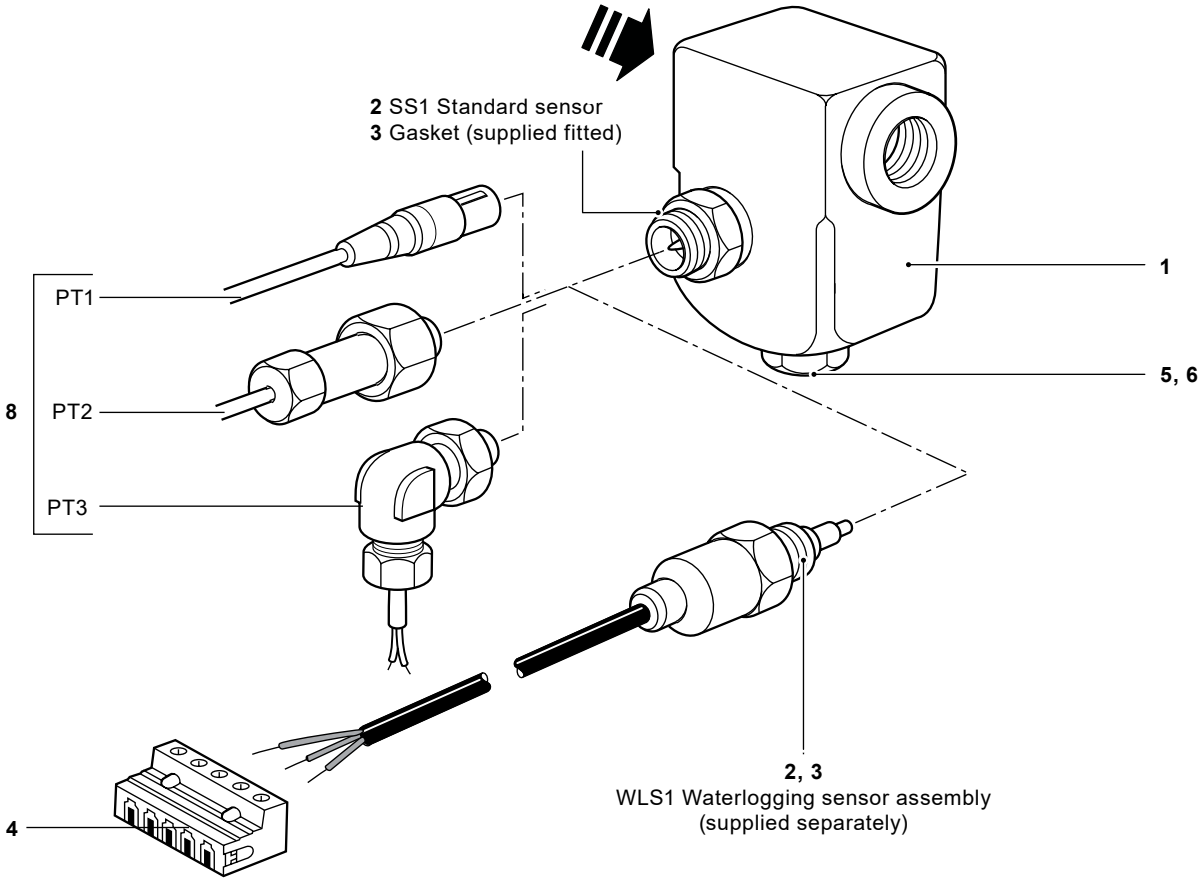
ST17



Body design conditions				PN40
PMA	Maximum allowable pressure		32 bar g	464 psi g
TMA	Maximum allowable temperature		240 °C	464 °F
Minimum allowable temperature			0 °C	32 °F
PMO	Maximum operating pressure for saturated steam service	**ST14**	32 bar g	464 psi g
		ST14 *CRN approved DN40 (1½") and DN50 (2")	30 bar g	435 psi g
		ST16	25 bar g	363 psi g
		ST17	32 bar g	464 psi g
TMO	Maximum operating temperature		240 °C	464 °F
Minimum operating temperature			0 °C	32 °F
ΔPMX	Maximum differential pressure is limited to the PMO			
Designed for a maximum cold hydraulic test pressure:			60 bar g	870 psi g
Note: With sensor fitted, test pressure must not exceed:			32 bar g	464 psi g

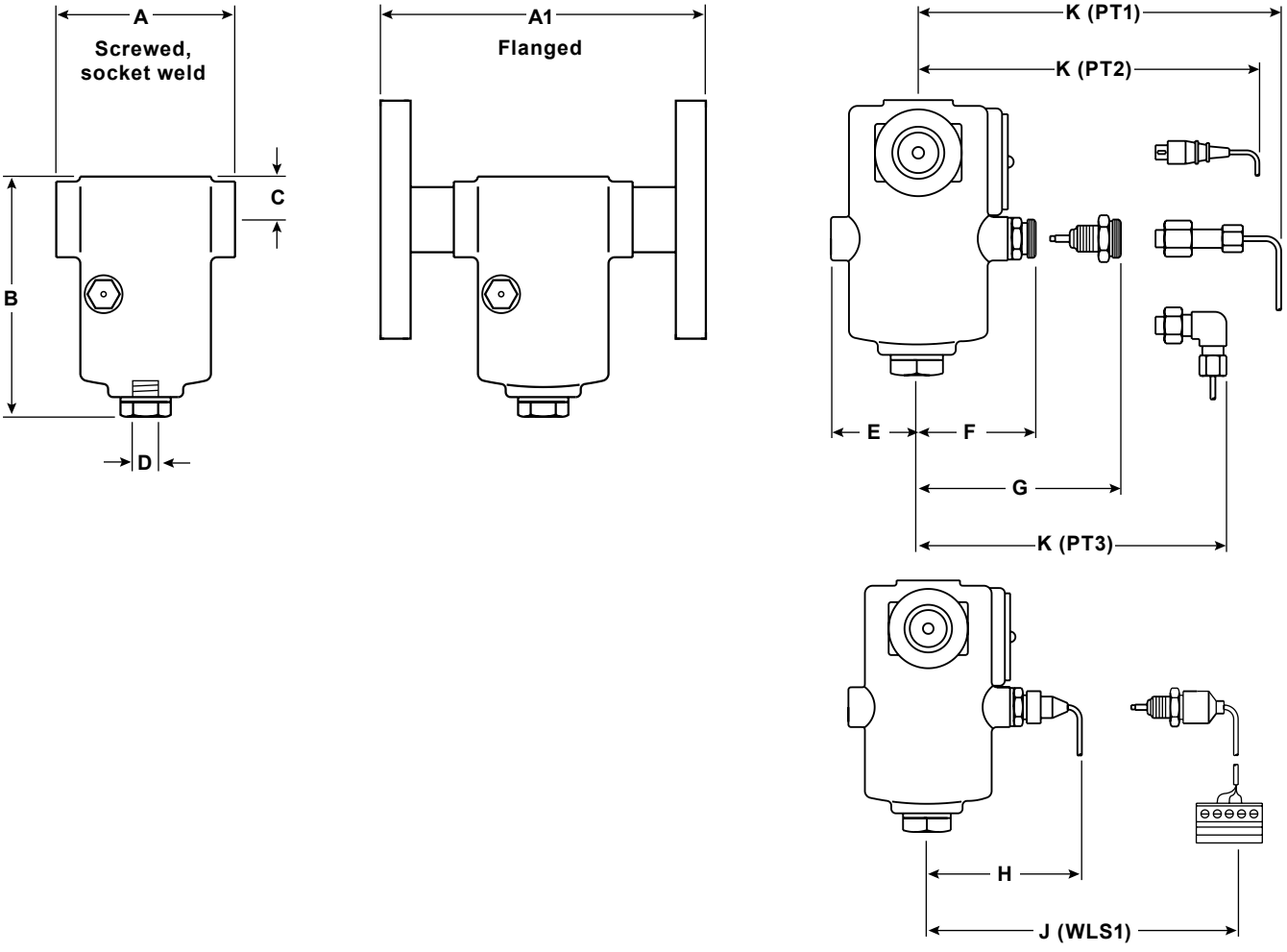
Materials

No.	Part			Material	
1	Sensor chamber	**ST14**		Steel	DIN 17425 GS C 25
		ST16		Stainless steel	AISI 316L
		ST17		SG iron	DIN 1693 GGG 40
2	SS1 standard sensor			Stainless steel	BS 970, 303, S31 and PEEK plastic
	WLS1 waterlogging sensor assembly			Stainless steel	BS 970, 303, S31 and PEEK plastic
3	Sensor gasket			Stainless steel	BS 1449 304 S16
4	Diode pack			Polyamide	6 - 6
5	Plug	**ST14**		Stainless steel	BS 970 431 S29
		ST16		Stainless steel	AISI 316L
		ST17		Stainless steel	BS 970 431 S29
6	Plug gasket	**ST14**		Stainless steel	BS 1449 304 S16
		ST16		Stainless steel	AISI 316L
		ST17		Stainless steel	BS 1449 304 S16
7	Flanges	**ST14**	DN15 to DN25 (½" to 1")	Steel	Mat No. 1.0460
			DN40 and DN50 (1½" and 2")	Steel	BS 1501 151 430
		ST16		Stainless steel	AISI 316L
8	PT1 connector			RYTON plastic	
	PT2 connector			RYTON plastic and brass (nickel plated)	
	PT3 connector			RYTON plastic and brass (nickel plated)	



Dimensions/weights (approximate) in mm (inches) and kg (lb)

Type	Size	A	A1	B	C	D	E	F	G	H	Withdrawal distance WLS1 J	Withdrawal distance PT1 K	Withdrawal distance PT2 K	Withdrawal distance PT3 K	Weight Scr.	Weight Flg.
ST14	DN15 - ½"	75 (2.95)	130 (5.12)	101 (3.98)	23 (0.91)	½"	33 (1.30)	46 (1.81)	85 (3.35)	88 (3.46)	127 (5)	119 (4.69)	129 (5.08)	97 (3.82)	0.82 (1.81)	2.3 (5.07)
	DN20 - ¾"															2.8 (6.17)
	DN25 - 1"	120 (4.72)	185 (7.28)	120 (4.72)	28 (1.10)	¾"	40 (1.57)	53 (2.09)	91 (3.58)	95 (3.74)	134 (5.28)	126 (4.96)	136 (3.35)	104 (4.09)	2.20 (4.85)	4.6 (10.1)
	DN40 - 1½"	252 (9.92)	393 (15.5)	215 (8.46)	45 (1.77)	1"	82 (3.23)	95 (3.74)	133 (5.24)	137 (5.39)	176 (6.93)	167 (6.57)	177 (6.97)	145 (5.71)	22.00 (48.5)	27.5 (60.6)
	DN50 - 2"															29.0 (63.9)
ST16	DN15 - ½"	75 (2.95)	130 (5.12)	101 (3.98)	23 (0.91)	½"	33 (1.30)	46 (1.81)	85 (3.35)	88 (3.46)	127 (5)	119 (4.69)	129 (5.08)	97 (3.82)	1.20 (2.65)	2.5 (5.51)
	DN20 - ¾"															3.0 (6.61)
	DN25 - 1"	120 (4.72)	185 (7.28)	120 (4.72)	28 (1.10)	¾"	40 (1.57)	53 (2.09)	91 (3.58)	95 (3.74)	134 (5.28)	126 (4.96)	136 (3.35)	104 (4.09)	2.20 (4.85)	4.6 (10.1)
ST17	½"	72 (2.83)	-	89 (3.50)	23 (0.91)	-	34.5 (1.36)	47 (1.85)	87 (3.43)	88 (3.46)	127 (5)	119 (4.69)	129 (5.08)	97 (3.82)	1.20 (2.65)	-
	¾"															
	1"	120 (4.72)	-	120 (4.72)	28 (1.10)	¾"	40 (1.57)	54 (2.13)	93 (3.66)	95 (3.74)	134 (5.28)	126 (4.96)	136 (3.35)	104 (4.09)	1.20 (2.65)	-



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note:

The sensor chamber should be installed immediately upstream of the steam trap (i.e. close coupled) in a horizontal pipeline with the direction of flow in accordance with the flow arrow on the body.

How to order

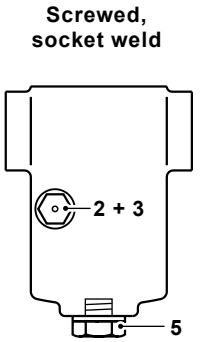
Example: 1 off Spirax Sarco DN25 Spiratec ST143 (ST143L if a left hand sensor fitting is required) sensor chamber assembly with end connections flanged EN 1092 PN40 fitted with SS1 standard sensor or Spiratec WLS1 waterlogging sensor.
Note: State if the WLS1 is to be supplied with or without a diode pack.

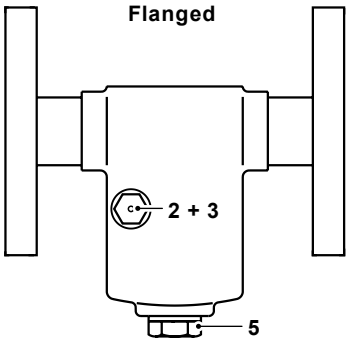
Spare parts

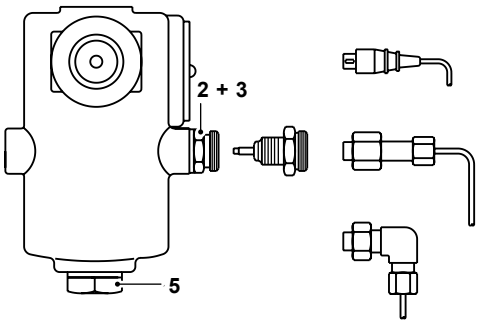
The spare parts available are detailed below. No other parts are supplied as spares.

Available spares

SS1 standard sensor and gasket	**2, 3**
WLS1 waterlogging sensor assembly and gasket	**2, 3**
WLS1 diode pack	**4**
Sensor gaskets (packs of 10)	**3**
Sensor blanking plug (optional extra - not shown)	



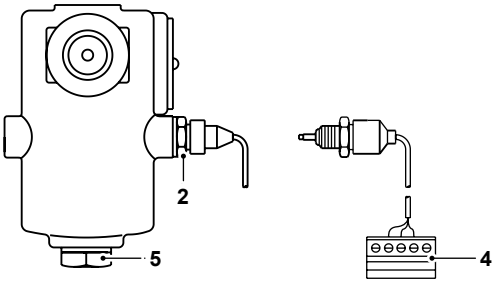




How to order spares

Always order the spares by using the description given in the column headed 'Available spares' and state the size of model of the sensor chamber.

Example: 1 - Sensor blanking plug for a ½" Spirax Sarco Spiratec ST141 sensor chamber.



Recommended tightening torques

Item	Part		mm	N m
2	Sensor		24 A/F	50 - 56
5	Plug	½" and ¾"	27 A/F	54 - 60
		1"	33 A/F	84 - 93
		1½" and 2"	40 A/F	130 - 145

TI-P087-02
EMM Issue 7

Spiratec R1 and R12 Remote Test Point

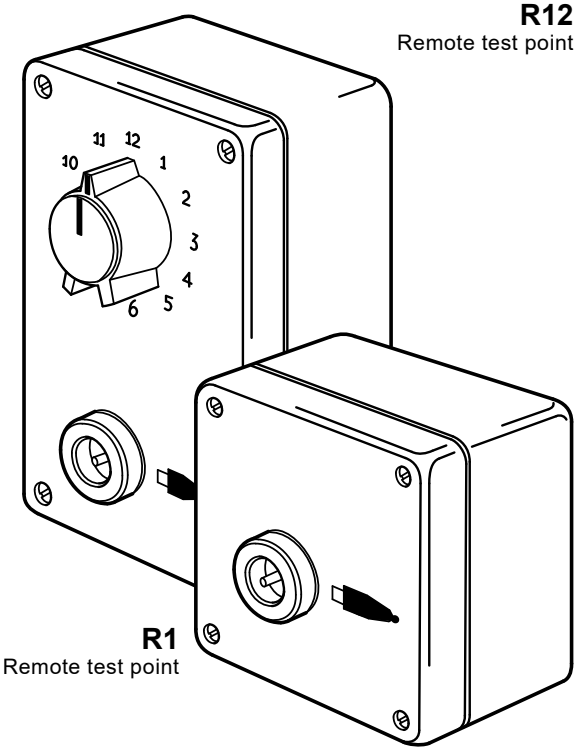
Description

The Spiratec trap fault detection system indicates if a steam trap is leaking steam. The Spiratec **R1** provides a remote test point for one Spiratec sensor. The Spiratec **R12** provides the same facility for up to twelve Spiratec sensors.
A PT2 or PT3 plug tail is used to connect the SS1 sensor in the sensor chamber or steam trap to the R1 or R12 remote test point at any convenient location. Trap checking is then carried out by plugging a Spiratec Type 30 indicator into the R1 or R12.

Note: The R1 and R12 remote test points can only be used with sensors for steam leak applications. **They are not suitable for use with WLS1 waterlogging sensors.**

WARNING

The R1 and R12 are not suitable for use in hazardous areas in the EC.



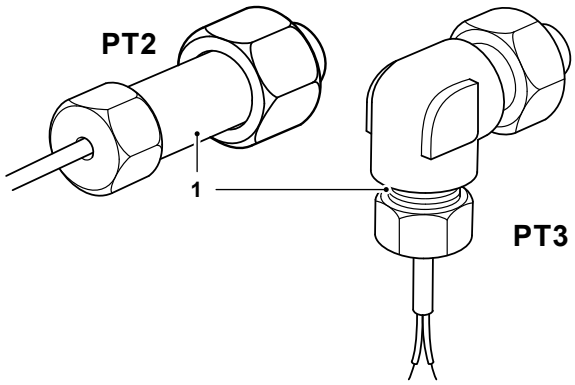
Available types

R1	Test point, suitable for a single steam trap.
R12	Test point has a selection switch which can be used for checking up to twelve steam traps.
PT2	Plug tail with screw on connection and brass straight pattern housing. Provides protection to IP67
PT3	Plug tail is available with screw-on connection and brass 90° housing. Provides protection to IP67.

The plug tail is supplied with 1.25 m (4.1 ft) of cable. Any additional cable must be provided by the installer in accordance with the Installation and Maintenance Instructions supplied with the product.
By removing the nut (**1**) a conduit adaptor can be connected to the M16 conduit thread on the housing, if cable protection is required.

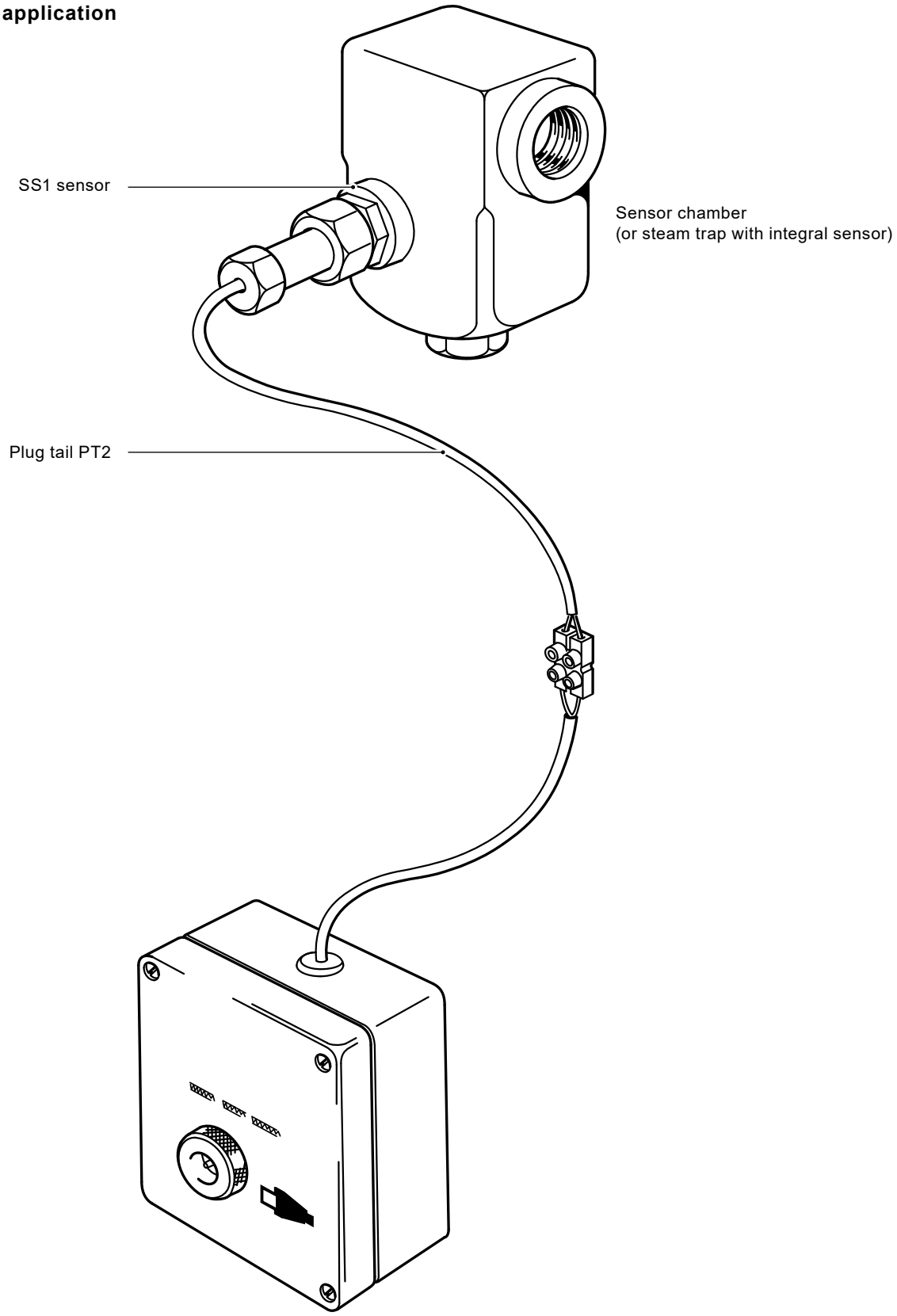
How to use the R1 and R12 remote test point:

R1	Plug the indicator cable into the socket provided and use the Type 30 or Type 40 indicator in accordance with its instructions.
R12	Use the rotary switch to select the sensor to be checked.



A typical application is shown on page 2

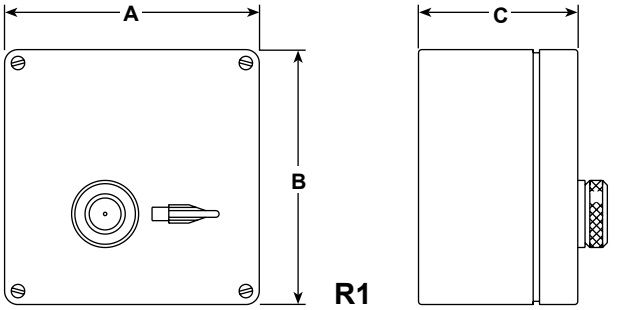
Typical application

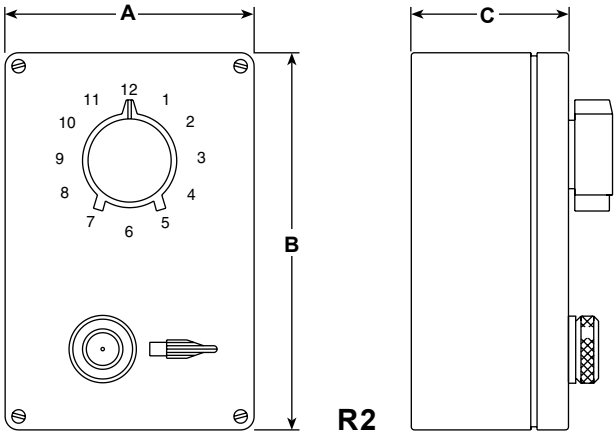


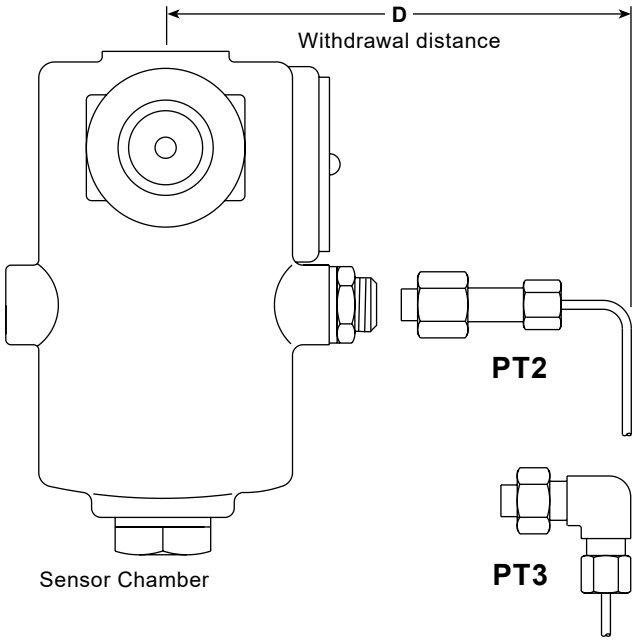
Dimensions/weights (approximate) in mm (inches) and kg (lbs)

Type	A	B	C	Weight
R1	82 (3.23)	80 (3.15)	55 (2.17)	0.2 (0.44)
R12	80 (3.15)	120 (4.72)		0.3 (0.66)

Sensor chamber size	D (PT2)	D (PT3)
½"	135 (5.31)	110 4.33)
¾"		
1"	140 (5.51)	115 4.53)
1½"	185 (7.28)	155 6.10)
2"		







How to order

Example: 1 off Spirax Sarco R1 remote test point.

TI-P087-32
EMM Issue 5

R1C
Steam Trap Failure Monitor

Description
The R1C steam trap failure monitor will monitor the performance of a single steam trap when used in conjunction with a Spiratec sensor chamber and sensor or a steam trap with integral sensor. It will indicate whether a trap is operating correctly, passing live steam or has failed closed by means of coloured trap status lights on the unit. Analogue and digital outputs allow it to be connected directly to BEMS/EMS to indicate steam trap status remotely.

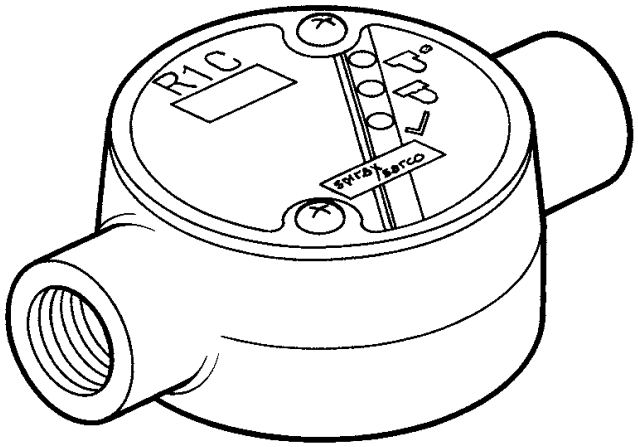
System components
To detect a steam trap that is leaking steam, a standard SS1 Spiratec sensor is installed in a sensor chamber or steam trap. To detect a steam trap that is leaking steam or is waterlogged, a WLS1 Spiratec waterlogging sensor assembly is installed in a sensor chamber or steam trap.

R1C system installation
The R1C must be installed in a steel conduit system within 10 m (32.8 ft) of the Spiratec sensor.

Connections
The R1C enclosure is a circular conduit box with M20 threaded entry holes. To maintain resistance to moisture, use a suitable cable gland between the R1C and the Spiratec sensor (Type SS1 or WLS1). If the cable to the BEMS/EMS passes through a conduit, make sure that the threaded connection to the R1C is water-tight to maintain the IP65 enclosure rating. Details of electrical connection are supplied with the product.

Materials

Body	Cast malleable iron with a black enamel finish



Enclosure rating
IP65 (when fitted with correct cable glands)

Electromagnetic compatibility directive (EMC) 89 /336 /EEC:
EN 61326: 1997 A1 and A2 Emmissions - Class B equipment, Table 4 EN 61326: 1997 A1 and A2 Immunity for Industrial Locations, Annex A

R1C supply voltage

The required supply voltage for the R1C depends on the output signal configuration as described below. To remain compliant the R1C needs to be connected to a CE marked BEMS /EMS system or power supply and must be earthed.

R1C configuration	Supply voltage required
4 - 20 mA output not used	separate 9-30 Vdc, < 35 mA
4 - 20 mA output used	separate 22-30 Vdc, < 35 mA

R1C operation

Trap status	Status lights
Trap operating correctly	Red and orange lights **OFF** Green light **FLASHING**
Trap leaking steam	Red light **ON** Green light **FLASHING**
Trap blocked or waterlogged	Orange light **ON** Green light **FLASHING**
Trap cold but free of condensate (this is a common state during system start-up or when the system is shutdown).	Red and orange lights **ON** Green light **FLASHING**

Note: During normal operation, the green light flashes ON every second to show that electrical power is connected to the R1C and that it is operating correctly.

Trap leaking steam detection period

Internal switches in the R1C allow the trap leaking detection period to be set to 2, 22, 44 or 88 minutes.

Condensate conductivity levels

Internal switches in the R1C allow the condensate conductivity detection level to be set to 17, 4.8 or 1.2 microsiemens depending on local conditions. In addition it can be disabled if required.

Trap waterlogging temperature levels

Internal switches in the R1C allow the waterlogging temperature level to be set to:
48°C, 63°C, 85°C, 111°C, 140°C, 169°C or 191°C
(118 °F, 145 °F, 185 °F, 232 °F, 284 °F, 336 °F or 376 °F).
In addition it can be disabled if required.

As supplied, the R1C comes factory set as follows:

Channel	Failure detection	Notes
Leak detection period	22 minutes	The trap must leak steam for 22 minutes before the R1C signals a fault.
Leak detection level	4.8 µS	The conductivity of the condensate in the sensor chamber must be greater than 4.8 microsiemens for correct operation.
Waterlogging detection temperature	85°C (185 °F)	The condensate in the sensor chamber must cool below this temperature before the R1C signals a waterlogging fault.

Output signals for remote indication of trap status

Digital outputs

PNP open collector output

Use this output to connect the R1C to a BEMS / EMS whose digital inputs are pulled down to 0 volts. The pnp outputs act like switches connected to the R1C's power supply. During normal trap operation, the pnp outputs will switch ON and give out a voltage equal to the R1C's power supply minus 0.4 V. Their output resistance in this state is 220 ohms. If the trap fails, one of the pnp digital outputs will switch OFF.

NPN open collector outputs

Use this output option to connect the R1C to a BEMS / EMS whose digital inputs are pulled up to a positive voltage. The npn outputs act like switches connected to 0 volts. During normal trap operation, the npn outputs will switch ON, giving out 0 volts with an output resistance of 220 ohms. If the trap fails, one of the npn digital outputs will switch OFF.

Trap status	R1C digital outputs	
	Waterlogged	Steam leak
Trap operating correctly	On	On
Trap leaking steam	On	Off
Trap blocked or waterlogged	Off	On
Trap cold, but free of condensate (or R1C failure)	Off	Off

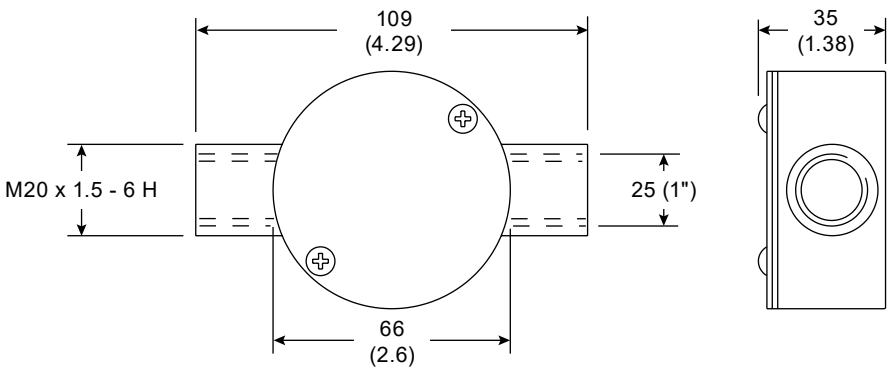
Analogue output:

An analogue output is available as standard for use with BEMS / EMS's that operate on an analogue input signal. Setting details are given below:

Trap status	Nominal output current from R1C	Recommended BEMS/ EMS alarm threshold settings
Trap operating correctly	20 mA	23.0 mA > set point > 17.5 mA
Trap leaking steam	15 mA	17.5 mA > set point > 12.5 mA
Trap blocked or waterlogged	10 mA	12.5 mA > set point > 7.5 mA
Trap cold, but free of condensate (or R1C failure)	4 mA	7.5 mA > set point > 0 mA

The current output from the R1C is derived from an internally powered loop and is capable of driving into an impedance of at least 550 ohms. In practice, this means that the maximum permissible distance between the R1C and the BEMS / EMS will be governed by the type of connecting cable used.

Dimensions (approximate) in mm (inches)



Maintenance

There are no user serviceable parts in the R1C.

How to order example

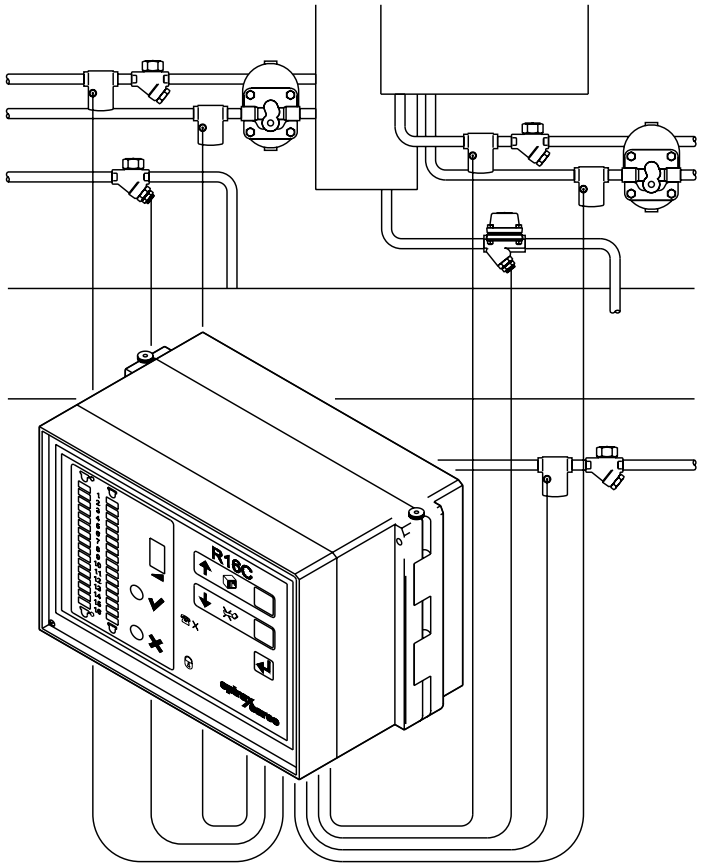
1 - Spirax Sarco R1C Steam trap failure monitor (pnp digital outputs),
or
1 - Spirax Sarco R1C Steam trap failure monitor (npn digital outputs)

TI-P087-20
EMM Issue 7

Spiratec
R16C
Automatic Steam Trap Monitor

Description

The Spiratec R16C is an automatic steam trap monitor for up to 16 steam traps. Remotely mounted, it continuously scans electronically up to 16 Spiratec sensors and indicates when steam wastage or waterlogging occurs at any of the traps being monitored.
A sensor is screwed into each sensor chamber or steam trap and is connected by wiring to the R16C which is sited at a convenient point.
When all the steam traps being monitored are working correctly a single green light will be illuminated. If one or more of the steam traps is failing, then the corresponding 'fail' lights (of which there are thirty two) are illuminated and the green light is extinguished.
The R16C, which operates continuously, will indicate that either all the traps are operating correctly, or that there is a failure of any particular identified trap or traps. The unit can be interfaced with most computer controlled Building Management Systems, through a pair of volt free contacts, which will open on trap failure.



Available types

R16C steam trap monitor is available as standard for use with low voltage supplies at 24 Vac. The monitor is supplied for wall or panel mounting.

Materials

Enclosure	ABS
Front panel	Polyester

Technical data

Supply voltage		24 Vac ±10%
Supply frequency		50 - 60 Hz
Supply current consumption		50 mA
Environmental limits	Operating temperature range	0 °C to 50 °C (32 °F to 122 °F)
	Maximum operating relative humidity	80% up to 31 °C (88 °F) decreasing linearly to 34% at 50 °C (122 °F)
	Maximum altitude	2 000 m (6562 ft) above sea level
Relay rating	Maximum voltage	24 Vac/dc
	Maximum current	0.5 A
	Maximum power	10 W
Enclosure rating		IP65 with correct cable glands (wall mounting unit only)
Electrical connections		Screw terminals

Accessories

Connectors for use with SS1 sensors

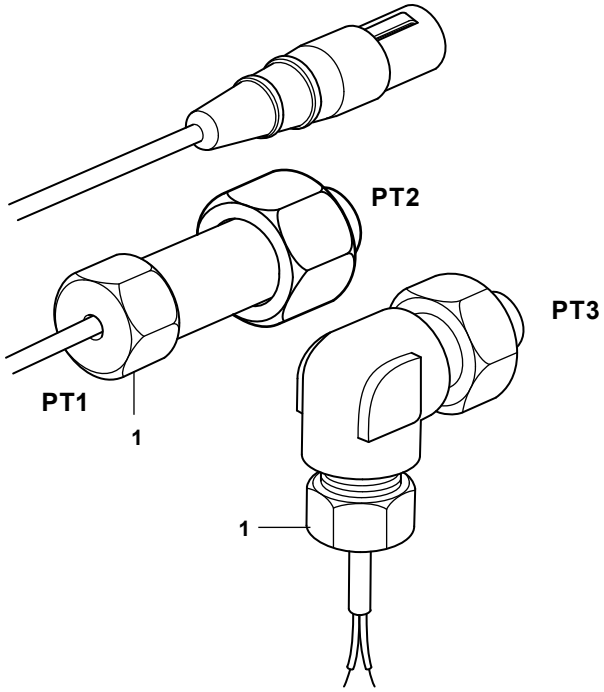
PT1 plug tail with push fit connection.

PT2 plug tail with screw on connection and straight pattern brass housing.

PT3 plug tail with screw on connection and angle pattern brass housing.
If cable protection is required, a conduit adaptor can be connected to the M16 conduit thread on the housing after removing the nut (**1**).
The plug tail is supplied with 1.25 m (4.10 ft) of cable. Any additional cable must be provided by the installer in accordance with the Installation and Maintenance Instructions.
Note: The type of cable is not critical, but a lightweight cable with 20 gauge conductors or 7/0.2 (0.22 mm²) multi-strand cable is suitable.

WLS1 combined steam leak and waterlog sensors.

The combined steam leak and waterlog sensor has an integral cable connected to it. This cable is connected via the customers wiring back to the R16C monitor.

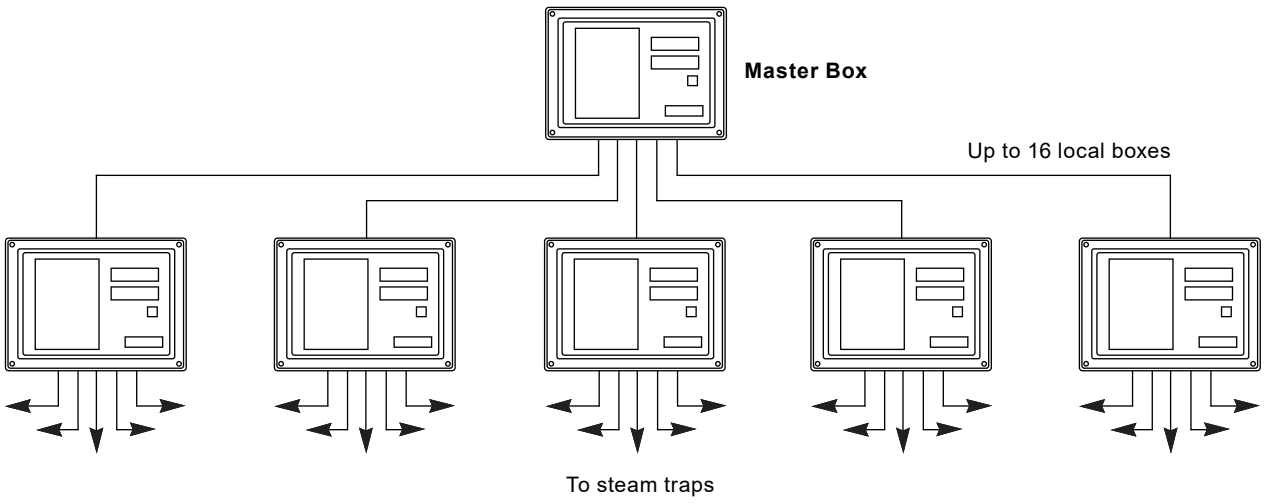


Installation

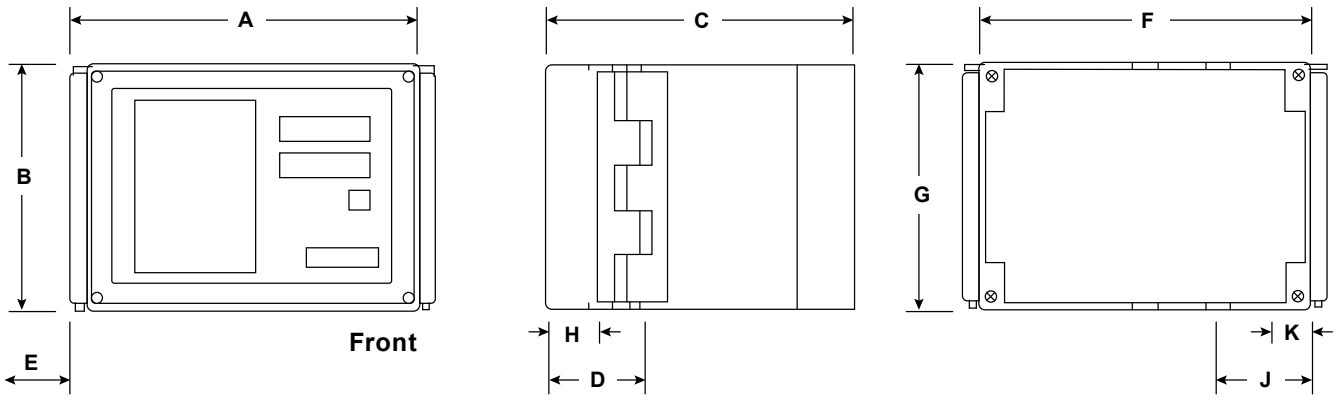
WARNING: This document does not give sufficient information to install the R16C safely. For further information see the Installation and Maintenance Instructions provided with the product (see IM-P087-22).

Use as master box

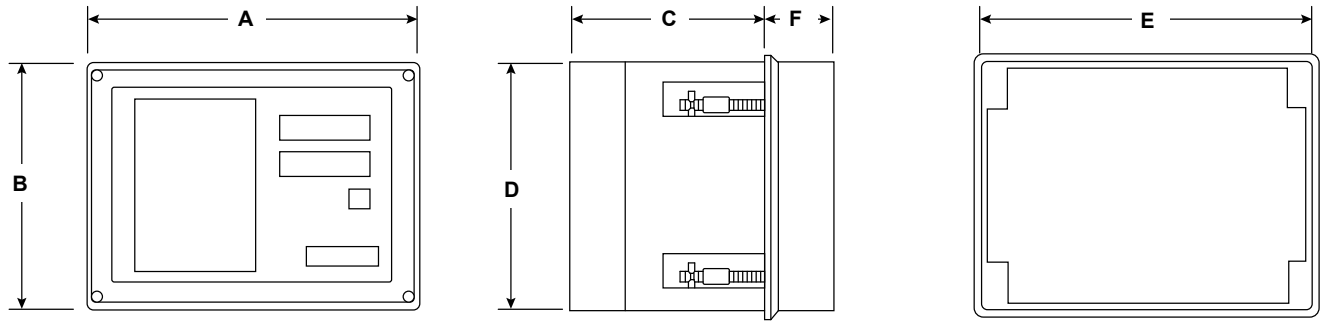
The R16C can be installed on a cascade basis. One 'master' box will monitor up to 16 x R16C 'local' boxes. A red light on the master box will indicate which 'local' box is registering a leaking trap. Inspection of that local box will then identify the specific trap which is failing.



Dimensions/weights (approximate) in mm (inches) and kg (lbs)



	A	B	C	D	E	F	G	H	J	K	Weight
Wall mounting	201 (7.91)	138 (5.43)	169 (6.65)	50 (1.97)	130 (5.12)	170 (6.69)	100 (3.94)	30 (1.18)	92 (3.62)	52 (2.05)	1.80 (3.97)



	A	B	C	D	E	F	Weight
Panel mounting	192 (7.56)	145 (5.71)	105 (4.13)	140 (5.51)	186 (7.32)	40 (1.57)	1.53 (3.37)

TI-P117-40
CMGT Issue 5

MSC-125 and MSC-160 Manifolds for Steam Distribution and Condensate Collection.

Description

A range of forged carbon steel compact manifolds with integral piston type stop valves for steam distribution and condensate collection duty.
MSC manifolds can be used for either steam distribution duty or condensate collection duty depending on the way they are installed.

Operation

In operation the piston valve should be either fully open or fully closed: **It is not intended for throttling duties.**
As the piston valve has such a large sealing area it is not necessary to use a valve key to ensure dead tight shut-off. Please note that manifolds without piston valves fitted are also available.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive (PED).

Certification

The product is available with certification to EN 10204 3.1.
Note: All certification / inspection requirements must be stated at the time of order placement.

Available types, sizes and pipe connections

MSC manifolds are available with 4, 8 or 12 connections, with and without integral piston isolation valves designated:

MSC04-125, MSC08-125 and MSC12-125 with 125 mm (4.92") pitch respectively DN15 (½") and DN20 (¾") screwed BSP, NPT or socket weld to B16.11 Class 3000 tracer ports are available as standard.

MSC04-160, MSC08-160 and MSC12-160 with 160 mm (6.3") pitch respectively DN15 (½") and DN20 (¾") screwed BSP, NPT or socket weld to B16.11 Class 3000 tracer ports are available as standard.

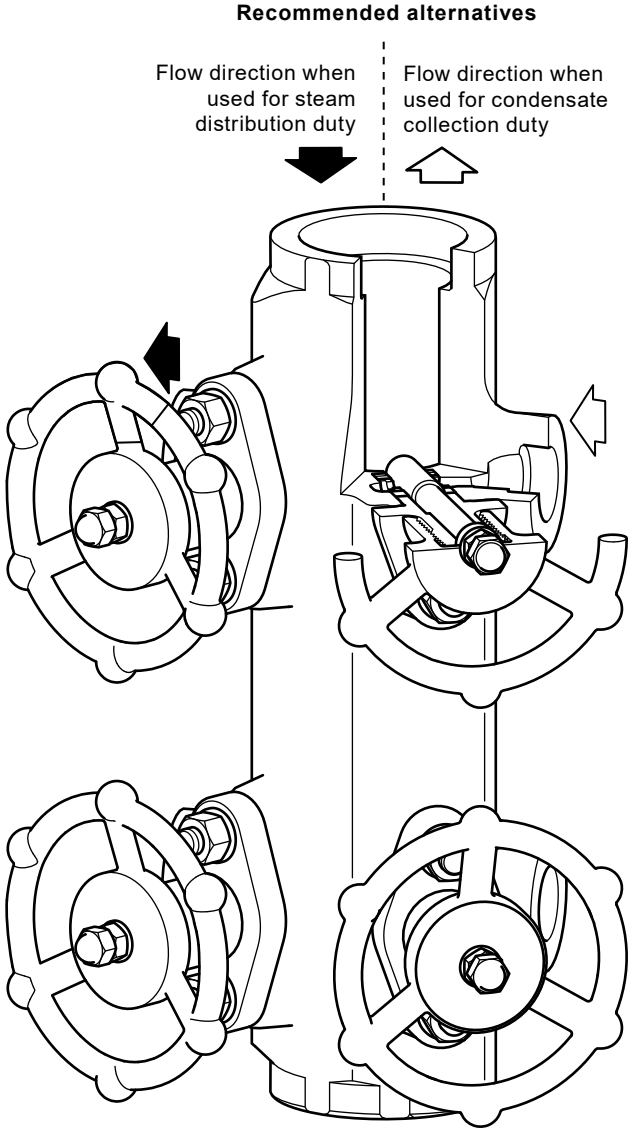
The steam main / condensate return connection is **DN40 (1½")** socket weld to ASME B 16.11 as standard.

Alternative connections, including flanged, are available on request.

Optional extras

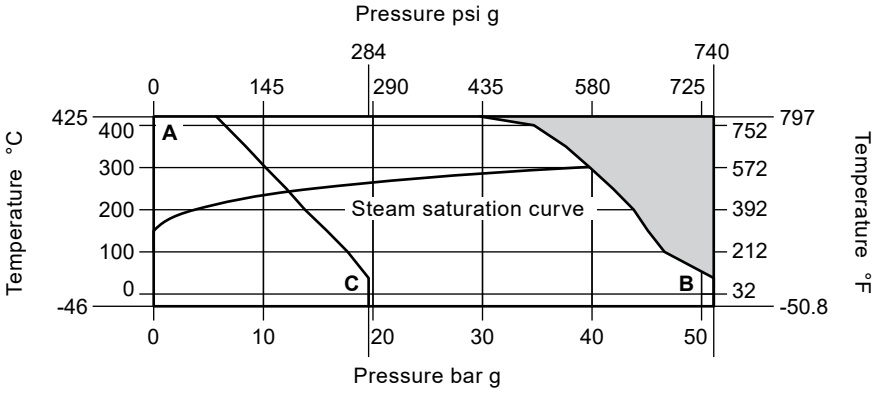
The following are available at extra cost:

- Mounting kit comprising of studs, spacers and nuts.
- Insulating jacket.
- Fitted with steam traps for quick installation projects.



MSC04-160 shown having socket weld connections

Pressure / temperature limits



2.9
2

The product **must not** be used in this region.

A - B Flanged ASME Class 300, screwed and socket weld.

A - C Flanged ASME Class 150.

Body design conditions				ASME B16.5 Class 300
PMA	Maximum allowable pressure		51 bar g @ 38 °C	740 psi g @ 100 °F
TMA	Maximum allowable temperature		425 °C @ 28 bar g	797 °F @ 406 psi g
Minimum allowable temperature			-46 °C	-50.8 °F
PMO	Maximum operating pressure for saturated steam service	ASME 150	14 bar g	203 psi g
		ASME 300, SW, NPT and BSP	41.5 bar g	602 psi g
TMO	Maximum operating temperature	ASME 150	425 °C @ 5.5 bar g	797 °F @ 80 psi g
		ASME 300, SW, NPT and BSP	425 °C @ 28 bar g	797 °F @ 406 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco			0 °C	32 °F
Designed for a maximum cold hydraulic test pressure of			77 bar g	1117 psi g

Kv values

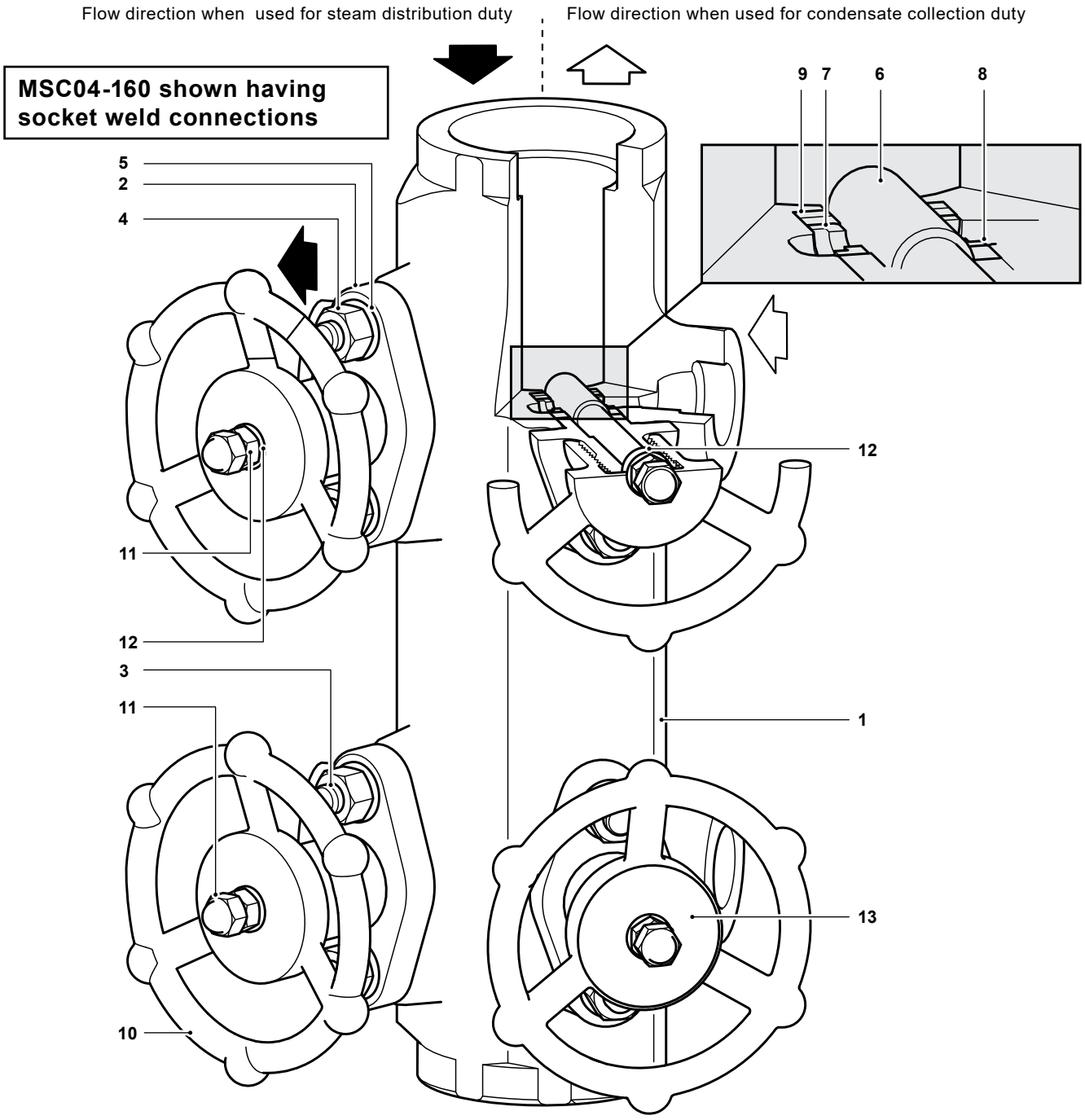
All sizes	Kv 1.8

For conversion:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

The Kv stated is for each valve rather than the complete manifold.

Materials

Recommended alternatives



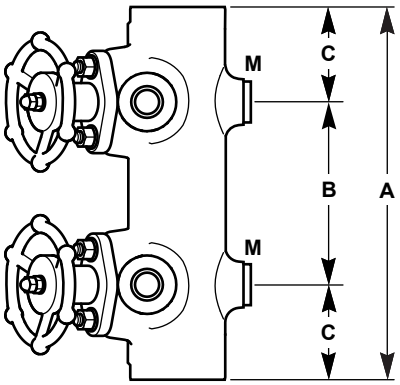
No.	Part	Material	
1	Body	Carbon steel	ASTM A105N/LF2
2	Bonnet	Carbon steel (Zinc plated)	ASTM A105N/LF2
3	Studs	Steel (plated)	ASTM A193 B7
4	Nuts	Steel (plated)	ASTM A194 2H
5	Washers	Stainless steel	
6	Piston	Stainless steel	AISI 410 : 1.4006
7	Lantern bush	Stainless steel	ASTM A276 : AISI 431

No.	Part	Material	
8	Upper ring	Graphite and stainless steel	
9	Lower ring	Graphite and stainless steel	
10	Handwheel	Carbon steel (Zinc plated)	EN 10213 : 1.0619N
11	Handwheel nuts	Stainless steel	
12	Nitronic 60 washer	Stainless steel	
13	Nameplates	Stainless steel	

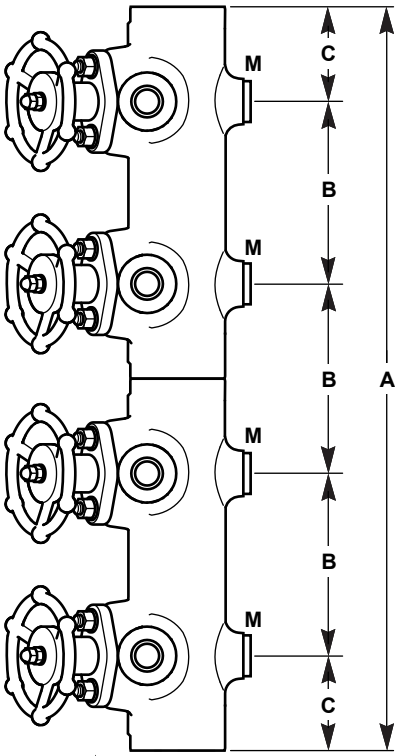
Note : There is one nameplate on the handwheel and two on the body, though not shown on the illustration.

Dimensions/weights (approximate) in mm (inches) and kg (lbs)

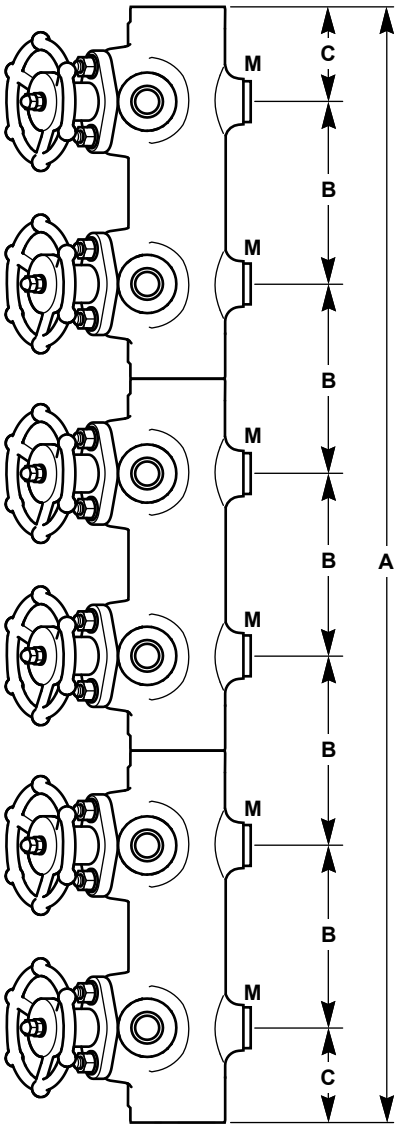
MSC04-160 and 125

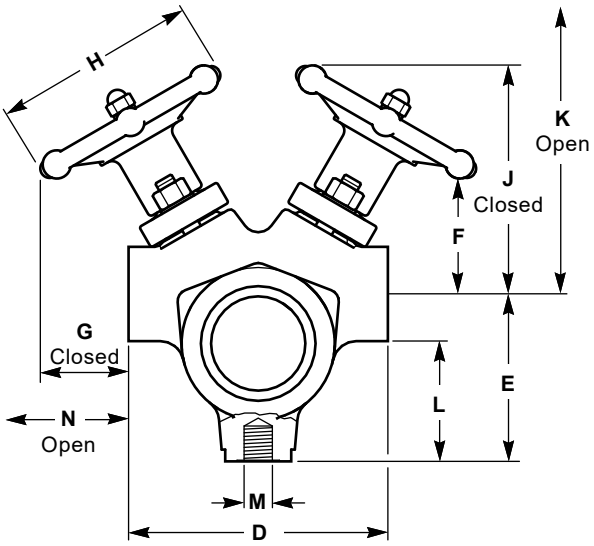


MSC08-160 and 125



MSC12-160 and 125





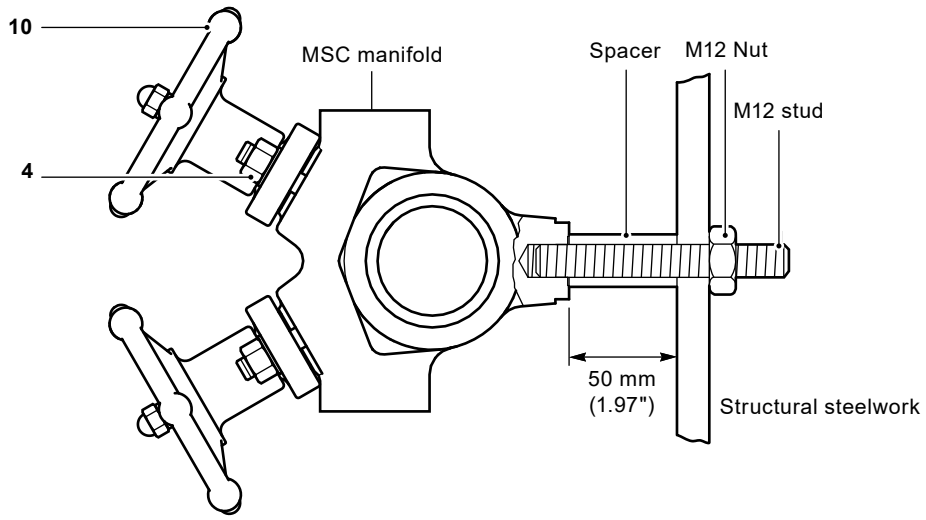
	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	Weight
160 mm pitch version	MSC04-160	325 (12.8)	160 (6.30)	82.5 (3.25)	110 (4.33)	71 (2.80)	48 (1.89)	37.5 (1.48)	75 (2.95)	102 (4.02)	120 (4.72)	50 (1.97)	M12	45 (1.77)	10 (22.0)
	MSC08-160	645 (25.4)													20 (44.1)
	MSC12-160	970 (38.2)													30 (66.1)
125 mm pitch version	MSC04-125	255 (10.0)	125 (4.92)	65 (2.56)	110 (4.33)	71 (2.80)	48 (1.89)	37.5 (1.48)	75 (2.95)	102 (4.02)	120 (4.72)	50 (1.97)	M12	45 (1.77)	9 (19.8)
	MSC08-125	505 (19.9)													18 (39.7)
	MSC12-125	755 (29.7)													26 (57.3)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

General

These manifolds have been designed for vertical installation. The back is provided with threaded connections M12 for ease of installation by attaching to a supporting structure.



Installation view from above

Mounting kits

The manifold is generally conveniently attached to the structural steelwork supporting the plant.
For ease of insulation it is recommended that spacers are fitted to give the manifold a stand-off of at least 50 mm (1.97").
For convenience the following sets of mounting kit are available:

- A single set comprising 2 off each stud, nut and spacer suitable for installing one MSC04-160 or MSC08-160.
- A single set comprising 4 off each stud, nut and spacer suitable for installing one MSC12-160.
- A multiple set comprising 12 off each stud, nut and spacer suitable for installing 6 x MSC04-160, 6 x MSC08-160 or 3 x MSC12-160.

After installation it is recommended that the manifold is insulated to minimise radiated heat losses and to protect personnel from burn risks. This is most easily done using the optional insulating jacket.

Steam distribution duty

The recommended installation is with the steam inlet connection at the top of the manifold. A trap set should be fitted to the bottom. The discharge from this trap set should ideally be returned. If it is to be discharged to atmosphere we recommend that a diffuser is fitted.

Condensate collection duty

The recommended installation is with the condensate outlet at the top. The bottom of the manifold should be fitted with a stop valve for blowdown purposes. Again, we recommend that a diffuser is fitted (see TI-P117-10).

How to order

Example: 1 off Spirax Sarco MSC08-125 steam distribution and condensate collection manifold, with 125mm pitch, Dual Certified ASTM A105N / A350LF2 forged carbon steel body with integral piston valves having 8 x DN20 socket weld connections to ASME B 16.11 Class 3000. Complete with EN 10204 3.1 certification as standard for the body and bonnet.

Spare parts

The spare parts available are detailed below. For ease of replacement an extractor tool is available for removing the sealing rings.

Available spares	
Sealing ring set	**8** and **9**
Piston valve assembly	**2**, **4**, **5**, **6**, **7**, **8**, **9**, **10**, **11** and **12**
Piston valve sub-assembly	**6**, **7**, **8** and **9**
Extractor tool	**See below**
Mounting kit (See page 5)	- A single set comprising 2 off each stud, nut and spacer suitable for installing one MSC04-160 or MSC08-160. - A single set comprising 4 off each stud, nut and spacer suitable for installing one MSC12-160. - A multiple set comprising 12 off each stud, nut and spacer suitable for installing 6 x MSC04-160, 6 x MSC08-160 or 3 x MSC12-160.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the type and size of manifold.

Example: 1 off Sealing ring set for an integral piston valve on a carbon steel manifold MSC04-125 DN15 socket weld.

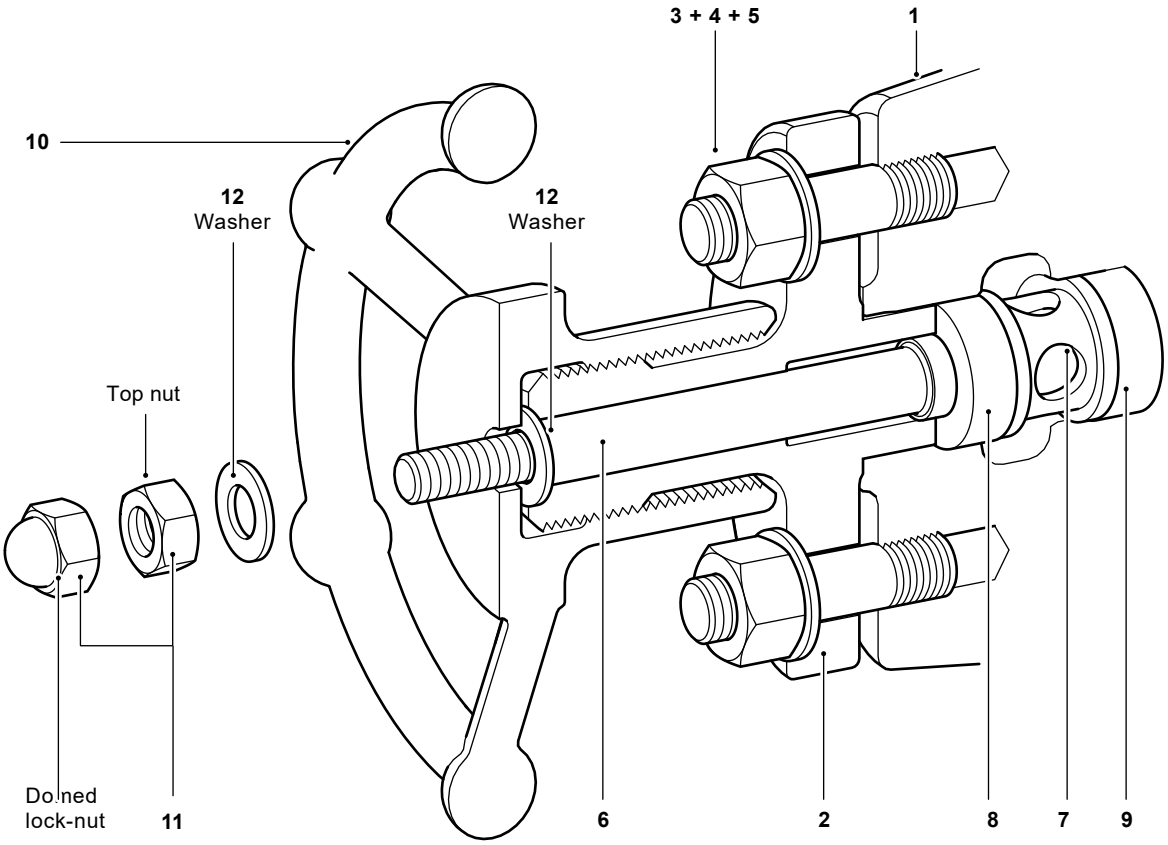
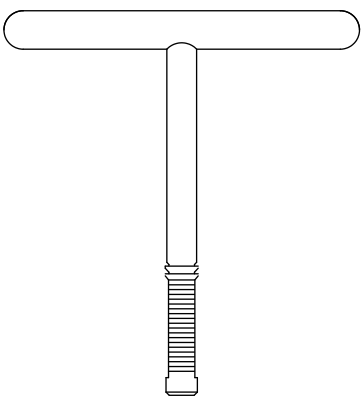


Table 1 Recommended tightening torques

Item	or mm	N m	lbf ft
4	14	5/16" x 18 UNC	12	8.9
11	10	M6	12	8.9

Extractor tool



TI-P115-01
CMGT Issue 3

MSC-210 Long Pitch Manifold for Condensate Collection

Description

A range of forged carbon steel compact manifolds for steam condensate collection duty. It is a component designed for use on manifold systems for ease of assembly of screwed PC3000 and PC4000 pipeline connectors.

Certification

The product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Available types, sizes and pipe connections

The MSC-210 with 210 mm pitch manifold is available with the following port connections.
½" screwed NPT, ¾" screwed NPT, ½" socket weld and ¾" socket weld to ASME B16.11 Class 3000 ports are available as standard.

The condensate return connection is 1½" socket weld to ASME B 16.11 Class 3000 as standard.

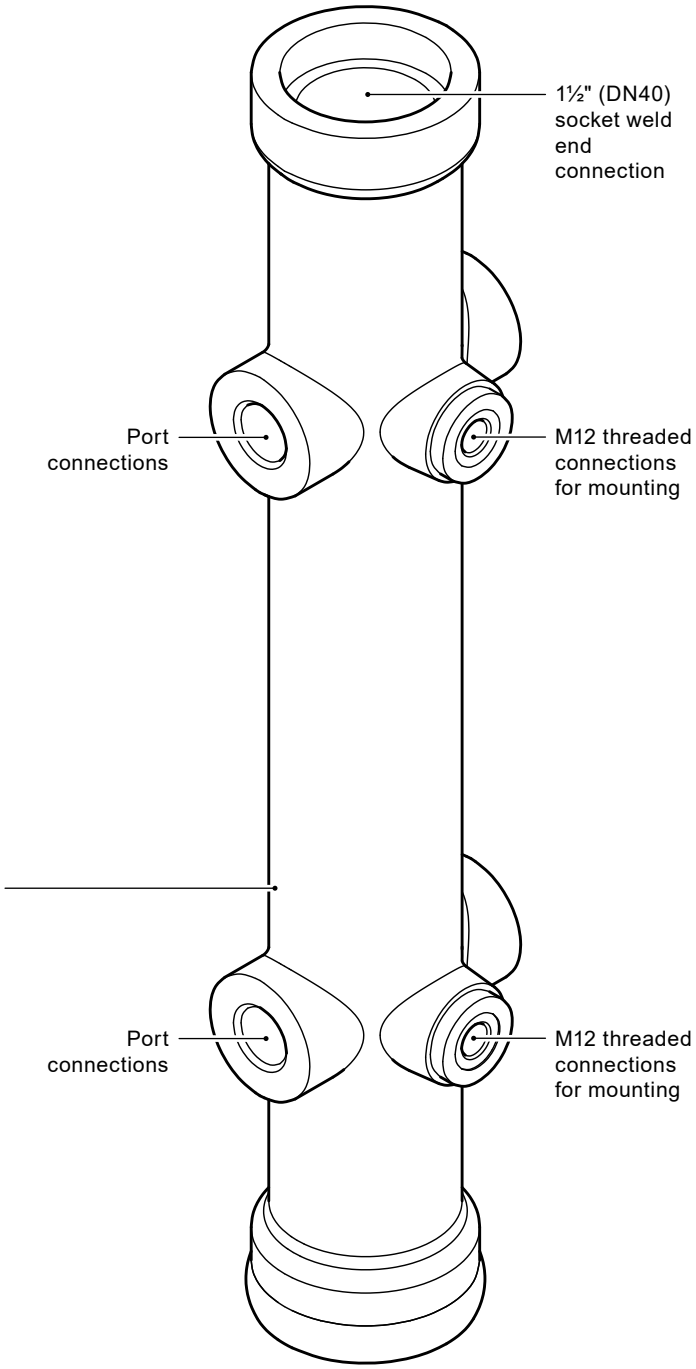
Optional extras

The following are available at extra cost:

- Mounting kit comprising of studs, spacers and nuts.

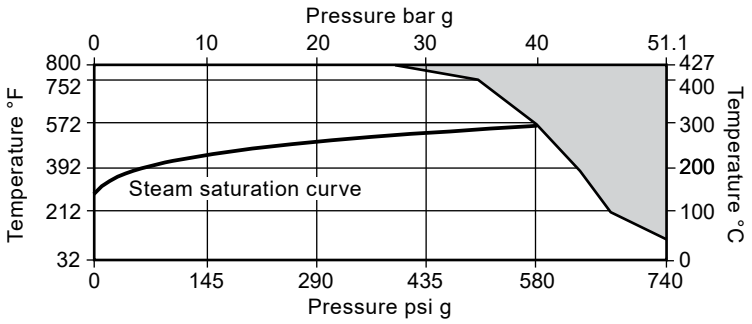
Materials

No.	Part	Material	
1	Body	Carbon steel	ASTM A105N/A350 LF2 CL1



MSC-210
shown having socket weld connections

Pressure/temperature limits

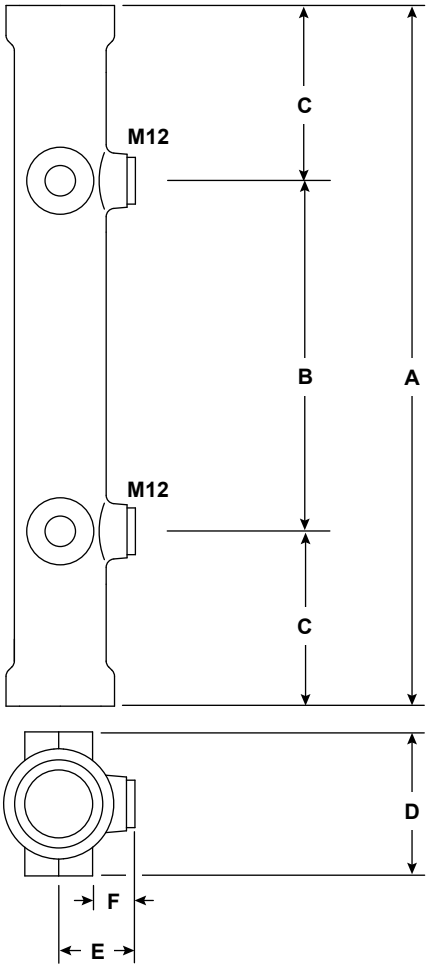


The product **must not** be used in this region.

Body design conditions			ASME B16.5 Class 300
PMA	Maximum allowable pressure	741 psig @ 100 °F	(51.1 bar g @ 38 °C)
TMA	Maximum allowable temperature	801 °F @ 410 psi g	(427 °C @ 28.3 bar g)
Minimum allowable temperature		-51 °F	(-46 °C)
PMO	Maximum operating pressure	741 psi g @ 100 °F	(51.1 bar g @ 38 °C)
TMO	Maximum operating temperature	801 °F @ 410 psi g	(427 °C @ 28.3 bar g)
Maximum operating pressure for saturated steam service		605 psi g	(41.7 bar g)
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco		32 °F	(0 °C)
Designed for a maximum cold hydraulic test pressure of		1204 psi g	(83 bar g)

Dimensions/weights (approximate) in inches (mm) and lbs (kg)

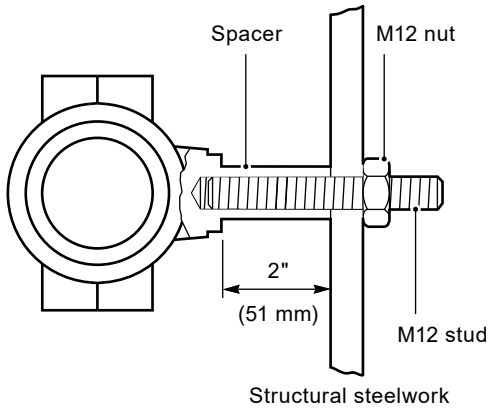
A	B	C	D	E	F	Weight
16.5	8	4.1	3.3	1.8	1	22
(419)	(203)	(104)	(84)	(46)	(25)	(10)



Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions supplied with the product.

General
These manifolds have been designed for vertical installation. The back is provided with threaded connections M12 for ease of installation by attaching to a supporting structure.

Installation view from above



Mounting kits
The manifold is generally conveniently attached to the structural steelwork supporting the plant.
For ease of insulation it is recommended that spacers are fitted to give the manifold a stand-off of at least 2" (51 mm).

For convenience the following set of mounting kit is available:

- A single set comprising 2 off each stud, nut and spacer suitable for installing one MSC-210.

After installation it is recommended that the manifold is insulated to minimise heat losses and to protect personnel from burn risks.

Condensate collection duty
The recommended installation is with the condensate outlet at the top. The bottom of the manifold should be fitted with a stop valve for blowdown purposes. Again, we recommend that a diffuser is fitted.

How to order
Example:
1 off Spirax Sarco MSC-210 steam condensate collection manifold, with 8" (203 mm) pitch, Dual Certified ASTM A105N/350LF2 forged carbon steel body with 4 x ¾" socket weld connections to ASME B 16.11 Class 3000.
Complete with EN 10204 3.1 certification.

Spare parts
The spare parts available are detailed below.

Available spares

Mounting kit (See above) - A single set comprising 2 off each stud, nut and spacer suitable for installing one MSC-210

PRESSURE/TEMPERATURE REGULATOR SOLUTIONS



Section contents ⟩

spirax sarco

SECTION 3 CONTENTS

Direct Operated Temperature Regulators	Safeguard Overheat Protection for 2 and 3 Port Temp. Control Valves	TI-P279-01-US
	25MT Direct Acting, Temperature Regulator	TI-P235-03-US
	BX and BXRA Bronze Self-Acting Control Valves	TI-P036-02-EN
	SB and SBRA Bronze Valves	TI-P044-01-EN
	BM and BMRA Cast Steel Valves	TI-P036-01-EN
	KA43, KB43 and KC43 Cast Steel Valves	TI-P078-06-EN
	TW 3 Port Valve for Liquid Systems	TI-P302-01-US
	SA121, SA122, SA128 and SA1219 Self-acting Temperature Control Systems	TI-P046-01-EN
	Temperature Control Ancilliaries	TI-P313-02-US
	Steam Capacities 2 Port Valves	TI-S99-11-US
	Water Capacity 2 and 3 Port Valves	TI-P281-01-US

Section 3 contents continued on next page

SECTION 3 CONTENTS (CONTINUED)

Direct Operated Pressure Regulators	Direct Operated Pressure Regulator 25MP	TI-P235-21-US
	LRV2B and LRV2S Gunmetal Pressure Reducing Valves	TI-P001-07-EN
	BRV2S and BRV2B SG Iron Pressure Reducing Valves	TI-P045-14-EN
	Stainless Steel Direct Operated Pressure Regulator SRV2S	TI-P186-05-EN
	Direct Operated Presure Regulator BRV71 & BRV73	TI-P210-01-EN
	Stainless Steel Direct Operated Pressure Regulator SRV461/463	TI-S39-01-US
Pilot Operated Pressure Regulators	Pilot Operated Pressure Regulator ½" to 4" 25P	TI-P235-05-US
	Pilot Operated Temperature Regulator 6" 25P	TI-S39-02-US
	Pressure Regulator with Air Loaded Pilot ½" to 4" 25PA	TI-P235-19-US
	Pilot Operated Pressure Regulators with Electric Override ½" to 4" 25PE	TI-S39-03-US
	Pilot Operated Pressure Regulator w/ Electric Override 6" 25PE	TI-P235-08-US
	Pilot Operated Pressure Reducing Valves with Cast Iron Bodies 1" to 4" 26P, 26PA, 26PE and 26BP	TI-P717-01-US
	Sizing & Selection Chart 25PA, 26P, 26PE, 26PA & all combinations	TI-P717-08-US
	Pilot Operated Back Pressure Regulator ½" to 4" 25BP	TI-P235-09-US
	Pilot Operated Back Pressure Regulator 6" 25BP	TI-P235-10-US
	Sizing & Selection Chart 25BP	TI-P717-07-US
	Stainless Steel Pilot Operated Pressure Regulators DP 163	TI-P107-01-EN

SECTION 3 CONTENTS (CONTINUED)

Pilot Operated Temperature Regulators	Pilot Operated Temperature Regulators ½" to 4" 25T	TI-P235-11-US
	Pilot Operated Temperature Regulator 6" 25T	TI-P235-12-US
	Pilot Operated Temperature Regulator with Electric Override ½" to 4" 25TE	TI-P235-13-US
	Pilot Operated Temperature Regulator with Electric Override 6" 25TE	TI-P305-01-US
	Electric Pilot Operated On/Off Regulator ½" to 4" 25E	TI-P235-20-US
	Electric Pilot Operated On/Off Regulator 6" 25E	TI-P237-01-US
	Pilot Operated Temperature Regulator 25 Series Thermostat Bulb Types	TI-P235-07-US
	Combination Pressure/Temperature Regulator ½" to 4" 25PT	TI-P235-14-US
	Combination Pressure/Temperature Regulator 6" 25PT	TI-P235-15-US
	Sizing & Selection Chart 25T, 25TE, 25E, 25PT, 25PTE	TI-P235-18-US
	Spare Parts Guide ½" to 4" Main Valves	TI-P717-09-US
	Spare Parts Guide 6" Main Valve	TI-P335-11-US
	Spare Parts Guide 25 / 26 Series Pressure & Temperature Pilots	TI-P235-02-US

Section 3 contents continued on next page

SECTION 3 CONTENTS
(CONTINUED)

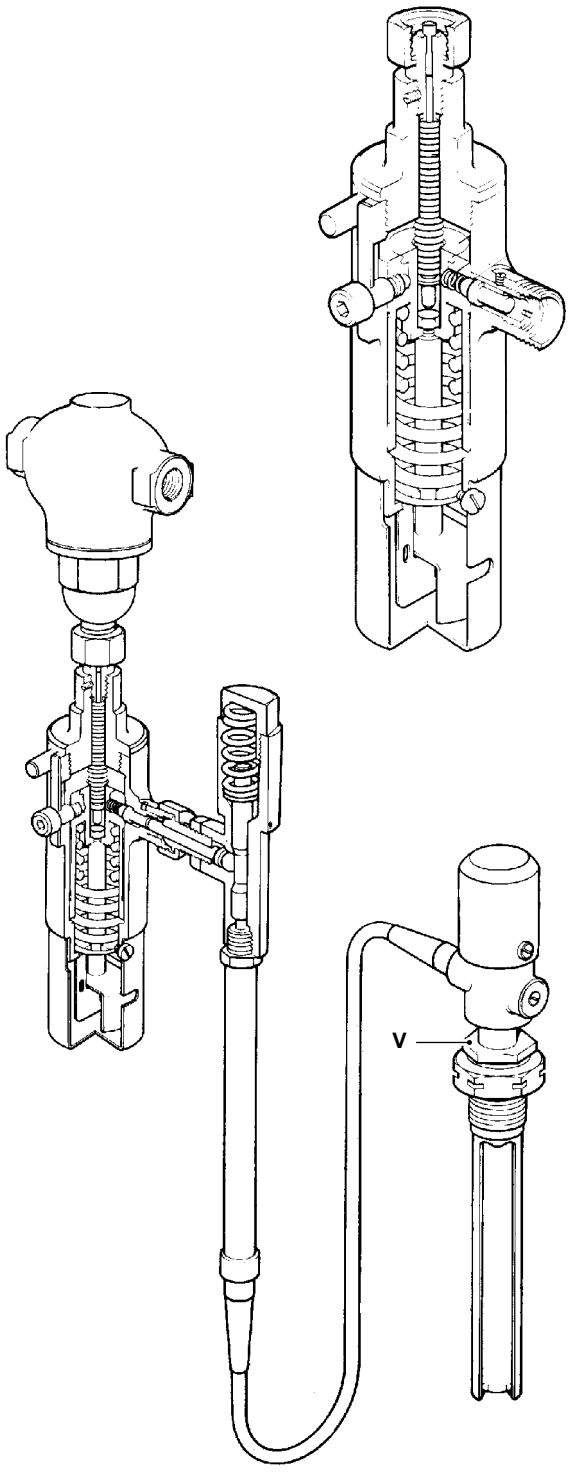
3 **Noise Attenuators**	Acoustic Blankets	TI-P139-04-US
	Acoustic Plates	TI-P108-01-US
	Acoustic Silencers	TI-P108-02-US
	Noise Diffuser D Series	TI-P108-03-US

TI-P279-01-US
Issue 1

Safeguard Overheat Protection for 2 and 3 Port Temperature Control Valves

Description

The Safeguard Overheat Protection system consists of the HL10 high limit cutout with a 130 control system and one of the valves listed below. The valve is installed upstream of a heating control valve or in parallel with a cooling control valve to provide secondary overheat protection. If the temperature at the sensor exceeds the setting, the HL10 cutout is activated to close a normally open valve or open a normally closed valve. The cutout must be reset manually. Failure of the 130 control system will activate the HL10 cutout. The HL10 is available with a microswitch which may be linked to an alarm system.



Control valves

Any of the following valves can be used by attaching the valve bonnet to the coupling nut of the HL10 high limit cutout.

	Normally open (to close w/ rise in temp)	Normally closed* (to open w/ rise in temp)
Two port valves	SB, KA, KB and KC valves	SBRA, KX, KY, NSRA valves
Three port valves	1", 1½", 2" (DN25, DN40, DN50) TW Valves	

* Normally closed valves must be installed in a separate bypass pipe line unimpeded by any other control valve.

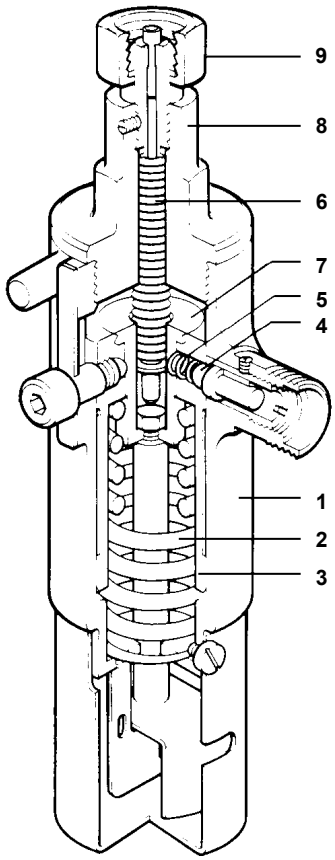
130 Control system

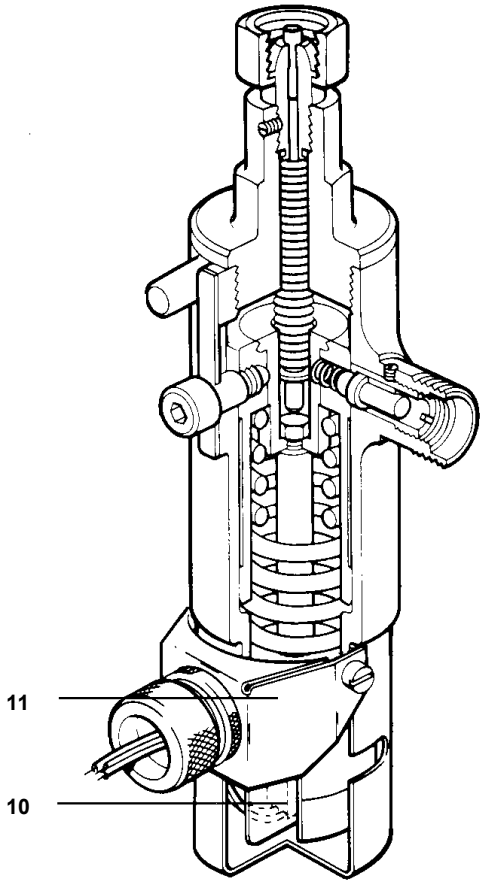
Standard capillary tube length is 6.5 ft (2 m). Other lengths are available up to a maximum of 32 ft (10 m) in multiples of 6.5 ft (2 m). The length of capillary tubing should be kept to a minimum to avoid the system's being affected by ambient temperature.

Separable well

For correct installation, a separable well with ¾" (DN20) NPT connection is required. The sensor is held in the separable well by means of a gland nut (V) and compression ring. Wells are available in copper, mild steel and stainless steel construction.

Materials

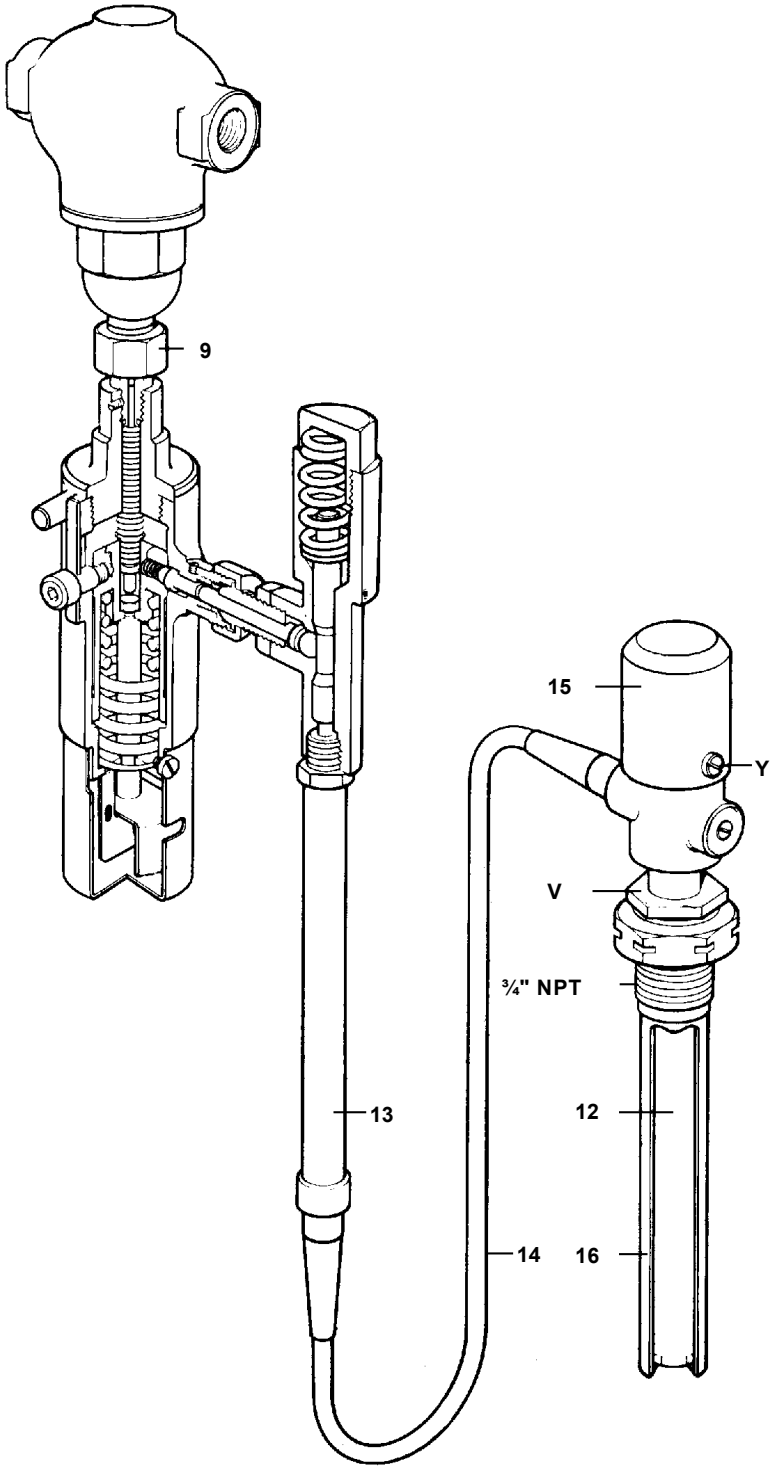




HL10
High limit cutout with micro switch

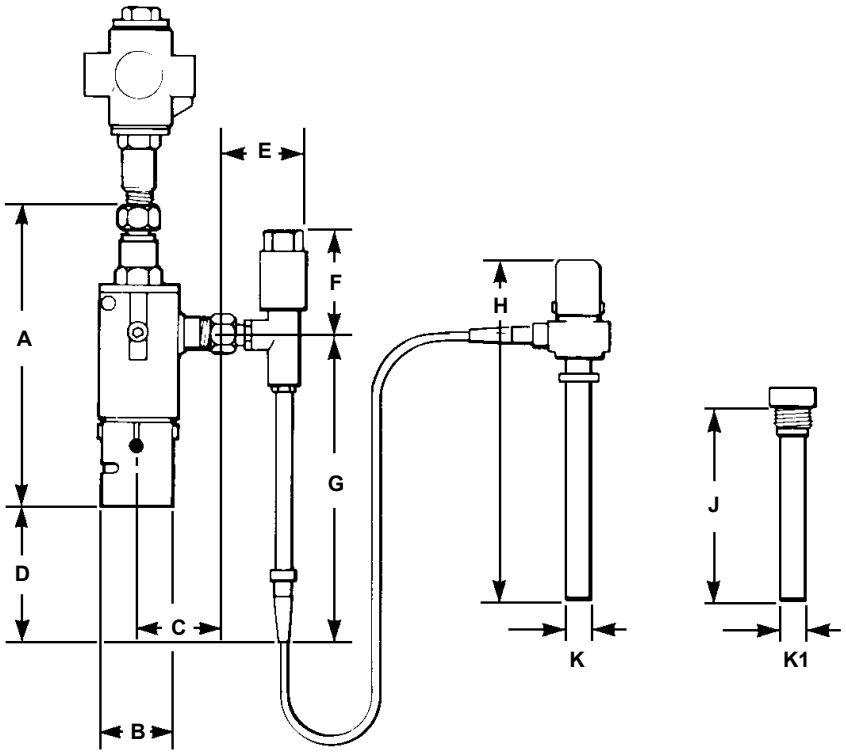
No.	Part	Material	Material spec.	Closest equivalent
1	Body	Bronze	BS 1400 LG2	ASTM B62 UNS C37700
2	Main spring	Stainless Steel		
3	Piston	Stainless Steel		
4	Ball	Stainless Steel		
5	Ball return spring	Stainless Steel		
6	Bellows	Stainless Steel		
7	Piston Insert	Stainless Steel		
8	Bonnet	Brass		
9	Valve coupling nut	Brass		
10	Micro switch			
11	Cover	Aluminum		

Materials (continued)



No.	Part	Material	Material spec.	Closest equivalent
9	Valve coupling nut	Brass		
13	Actuator	Brass		
14	Capillary tube	Copper PVC covered		
15	Adjustment head cover	Polypropylene plastic		
16	Separable well	Stainless steel Mild steel Copper		

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



	A	B	C	D	Weight
HL 10	9.3	2.4	2.4	3.0	4.8 lb
	(236)	(61)	(61)	(76)	(2.2 kg)

	E	F	G	H	J	K	K1	Weight
130 Control System	2.5	3.3	9.3	10	5.9	0.69	0.87	3.8 lb
	(64)	(84)	(236)	(254)	(150)	(17.5)	(22)	(1.7 kg)

Sample specification

Spirax Sarco Safeguard (with microswitch), a spring loaded mechanism incorporating a cutout device and requiring hand reset. A brass hydraulically operated secondary overheat protection control system mounted in a separable well with PVC covered copper capillary tubing. The unit is coupled to a 2 port or 3 port valve.

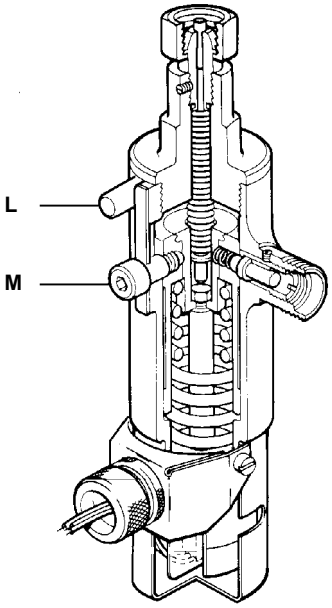
Temperature setting

The system is set to operate at 140 ˚F (60 ˚C). The setting can be adjusted between 32 ˚F (0 ˚C) and 212 ˚F (100 ˚C). Full setting details are given in the Installation & Maintenance Instructions supplied with each control system and these should always be referred to. One turn of the setting screw changes the temperature by 11 ˚F (6 ˚C). On completion always replace the adjustment head cover.

Resetting

Resetting can be swiftly carried out by using a lever between the two lugs L and M.

Before resetting, it is most important to allow the equipment to cool and to remedy the cause of overheating.



HL10
High limit cutout with micro switch

Optional extras

A micro switch (10) is available, which can be connected into an alarm system, and can be arranged to either make or break the electrical circuit on firing of the cutout.

It is suitable for the following ratings:

	Voltage	Resistive load Amps	Inductive load Amps
AC	125	5	5
	250	5	5
DC	up to 15	10	10
	30	5	3
	50	1	1
	75	0.75	0.25
	125	0.5	0.06
	250	0.25	0.03

Installation

Full details are given in the Installation & Maintenance Instructions, supplied with each unit.

Testing

As an emergency device, it is advisable to test this unit occasionally. This should be done either by temporarily raising the temperature of the equipment being controlled or by adjusting down the temperature at which the cutout is normally set to operate.

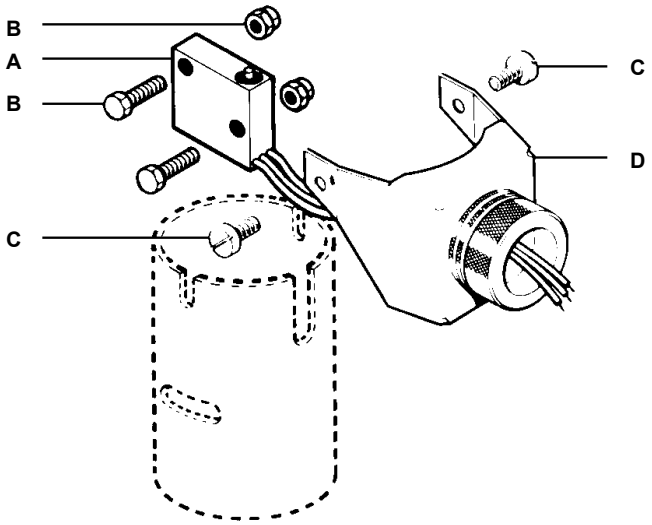
Warning

The cutout device is spring loaded and should not be opened up by unskilled persons, nor should it be 'fired' other than when attached to the valve.

Spare arts

Available spare parts are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Micro Switch Assembly	**A, B (2 each)**
Conversion Kit	**A, B (2 each), C (2 each), D**



TI-P235-03-US
Issue 3

Direct Acting Temperature Regulator 25 MT

Description

The 25 MT is a self-actuated temperature control valve with a calibrated dial for accurate temperature setting. A variety of solid-fill sensing bulbs are available (see TI-P235-07-US). The standard capillary tubing length is 8 feet (2.4 meters), with an optional standard length of 15 feet (4.6 meters).

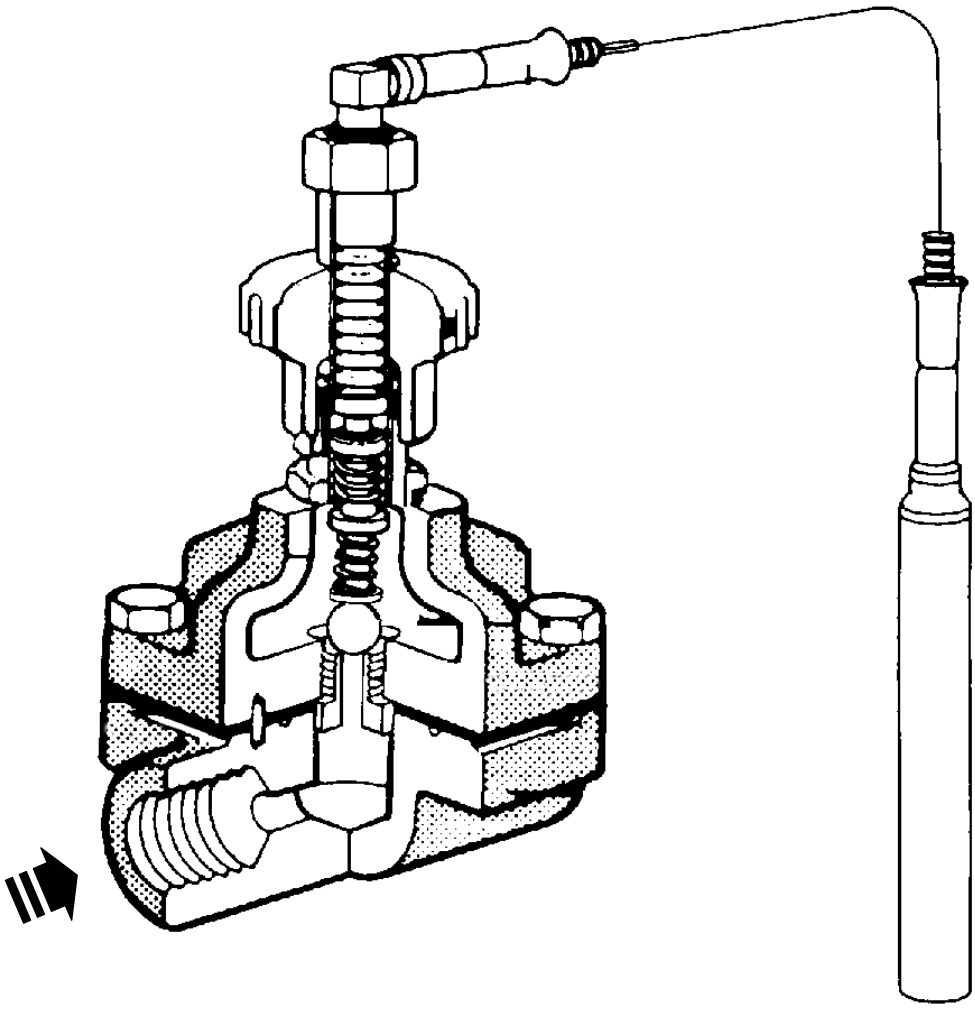
Model	25MT
Sizes	½" (DN15)
Connections	NPT
Construction	Cast Iron
Options	BSP Connections Non-standard capillary tubing lengths (see TI-P235-07-US)

Typical applications

Small storage steam water heaters, instantaneous heat exchangers and converters, air handling coils, tank heating coils, steam jacketed vessels, steam chests, molds and platens.

Sample specification

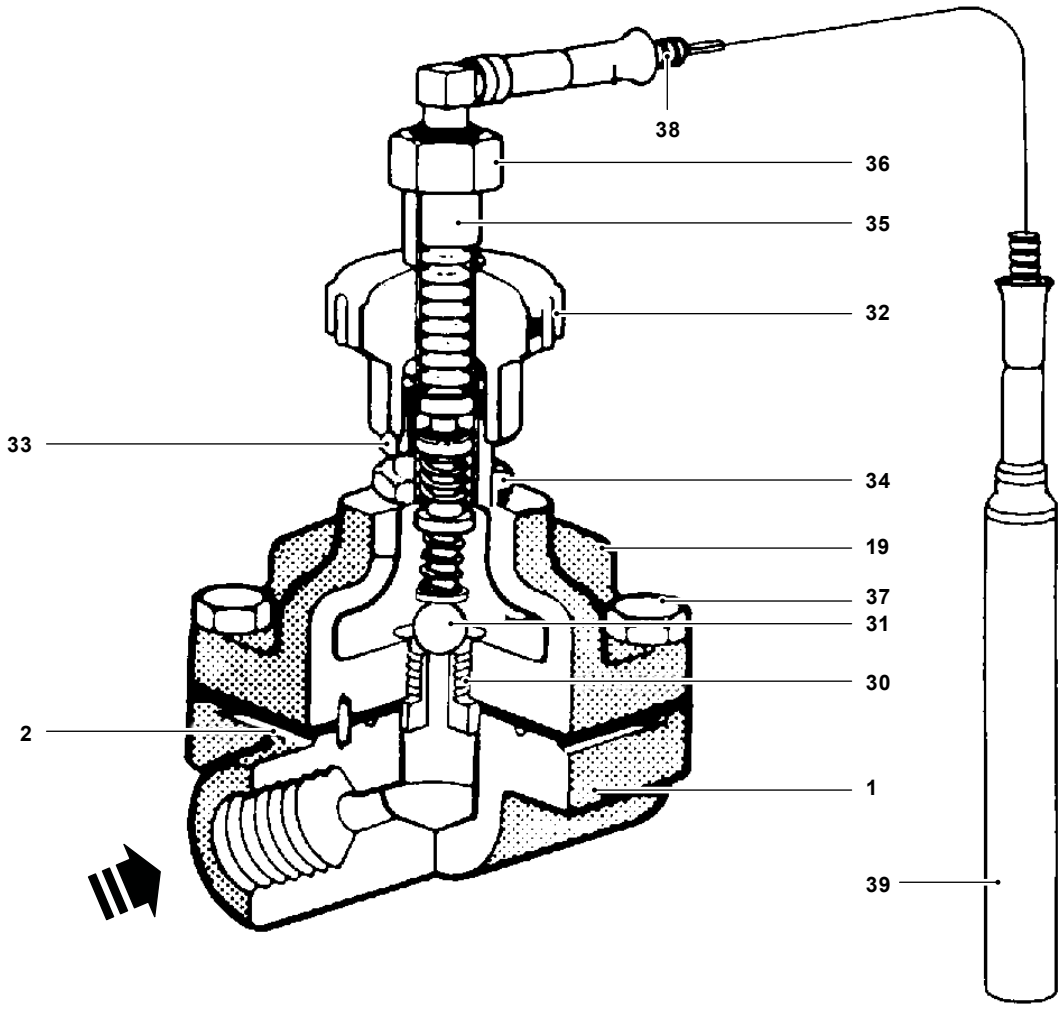
The temperature control valves shall be self-actuated. The temperature setting shall be adjustable without the use of tools, and the set point shall be indicated on a calibrated dial. Thermostatic system shall be solid fill, and shall incorporate overheat protection.



25 MT capacity Pounds of Saturated Steam per Hour

Inlet Pressure psi g (bar g)	Outlet Pressure psi g (bar g)	Capacity lb/hr (kg/hr) Vs P-Band (°F)		
		5 Cv > .134	10 .25	20 .47
10 (0.7)	0 (0)	5.3 (2.4)	9.7 (4.4)	18.5 (8.4)
10 (0.7)	3 (0.2)	4.8 (2.2)	8.8 (4.0)	16.6 (7.5)
10 (0.7)	5 (0.3)	4.3 (1.9)	7.8 (3.5)	14.8 (6.7)
25 (1.7)	0-5 (0-0.3)	8.5 (3.9)	15.6 (7.1)	29.7 (13.5)
25 (1.7)	15 (1.0)	7.4 (3.4)	13.6 (6.2)	25.8 (13.5)
25 (1.7)	20 (1.4)	5.6 (2.5)	10.4 (4.7)	19.7 (8.6)
50 (3.4)	0-18 (0-1.2)	13.9 (6.3)	25.5 (11.6)	48.3 (21.9)
50 (3.4)	35 (2.4)	11.7 (5.3)	21.5 (4.8)	40.8 (18.5)
50 (3.4)	42 (2.9)	9.1 (4.1)	16.8 (7.6)	31.8 (14.4)
75 (5.2)	0-30 (0-2.1)	19.2 (8.7)	35.3 (16.0)	67.0 (30.4)
75 (5.2)	55 (3.8)	16.0 (7.3)	29.4 (13.3)	55.8 (25.3)
75 (5.2)	65 (4.5)	12.1 (5.5)	22.2 (10.1)	42.2 (19.1)
100 (6.9)	0-43 (0-3.0)	24.6 (11.2)	45.1 (20.5)	85.7 (38.9)
100 (6.9)	75 (5.2)	20.3 (9.2)	37.3 (16.2)	70.7 (32.1)
100 (6.9)	85 (5.9)	16.6 (7.5)	30.4 (13.8)	57.8 (26.2)
150 (10.3)	0-68 (0-4.7)	35.3 (16.0)	64.8 (29.4)	123.1 (55.8)
150 (10.3)	105 (7.2)	31.5 (14.2)	57.8 (26.2)	109.7 (49.8)
150 (10.3)	130 (9.0)	23.1 (10.5)	42.3 (19.2)	80.4 (36.5)
200 (13.8)	0-93 (0-6.4)	46.0 (20.9)	84.5 (38.3)	160.4 (72.8)
200 (13.8)	140 (9.7)	41.3 (18.7)	75.8 (34.4)	144.0 (65.3)
200 (13.8)	170 (11.7)	31.9 (14.5)	58.6 (26.6)	111.2 (50.4)
250 (17.2)	0-118 (0-8.1)	56.8 (25.8)	104.2 (47.3)	197.8 (89.7)
250 (17.2)	175 (12.1)	51.1 (23.1)	93.9 (42.6)	178.3 (80.9)
250 (17.2)	210 (14.5)	40.7 (18.9)	74.6 (33.8)	141.7 (64.3)

Materials



No.	Part	Material	
1	"M" Body	Cast Iron	ASTM A 126 CL B
2	Gasket	Graphite	
19	"T" Body	Cast Iron	ASTM A 126 CL B
30	Pilot Valve Seat	Stainless Steel	
31	Pilot Valve Head	Stainless Steel	
32	Adjustment Knob	Phenolic	
33	Pointer	Stainless Steel	
34	Extension Nut	Brass	
35	Case Tube	Brass	
36	Retaining Nut	Brass	
37	Pilot Mounting Screws	Steel	ASTM A449
38	Capillary Tube	Varies with style selected	
39	Bulb	Varies with style selected	

Limiting operating conditions

Maximum operating pressure (PMO)	250 psi g (17 bar g)
Maximum operating temperature*	450 °F (232 °C)

*The temperature of the sensing bulb must not exceed 350 °F (177 °C)

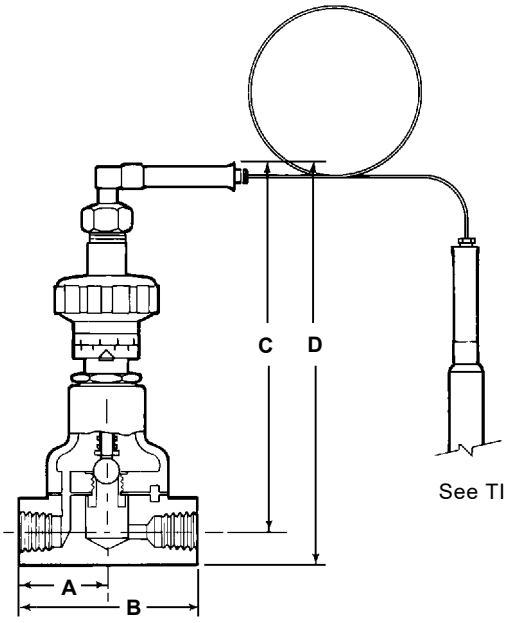
Standard temperature ranges

30 °F to 90 °F	(-1 °C to 32 °C)
60 °F to 120 °F	(16 °C to 49 °C)
100 °F to 160 °F	(38 °C to 71 °C)
120 °F to 180 °F	(49 °C to 82 °C)
160 °F to 220 °F	(71 °C to 104 °C)
200 °F to 260 °F	(93 °C to 127 °C)
260 °F to 320 °F	(127 °C to 160 °C)

Pressure shell design conditions

PMA	Maximum allowable pressure	250 psi g/0-450 °F	(17 bar g/0-232 °C)
TMA	Maximum allowable temperature	450 °F/0-250 psi g	(232 °C/0-17 bar g)

Dimensions/weight (approximate) in inches (mm) and lbs (kg)



See TI-P235-07-US for sensing bulb dimensions

Size	A	B	C	D	Weight
½"	1.75	3.5	7.38	8.06	5.25 lb
	(44)	(89)	(187)	(205)	(2.4 kg)

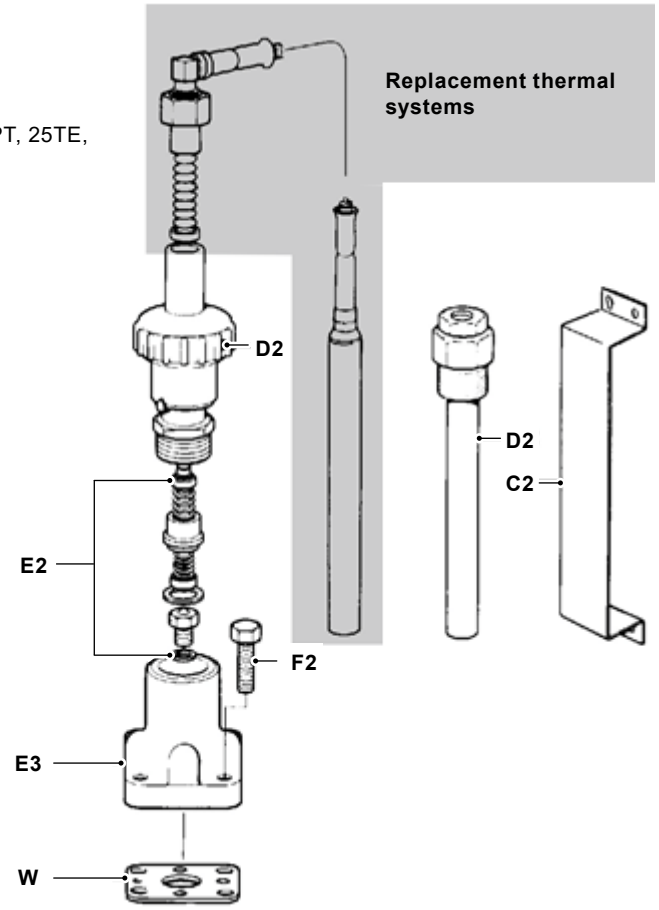
Installation and maintenance

The regulator should be installed in a horizontal pipe with suitable by-pass and isolating valves. A steam trap must be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The thermostatic bulb must be carefully located in the medium being heated. Complete installation and maintenance instruction are given in IM-1-1125-US, which accompanies the product.

Spare parts

Exploded view

Temperature pilot parts for 25T, 25PT, 25TE, 25PTE and 25MT



Temperature Pilot
(see TI-P235-07-US)

Thermal System (T1, T2, T10, T11) State bulb style, capillary tube length and temperature range	**A2**
Well (T5, T6, T7, T8) (Specify bulb style)	**B2**
Wall Mounting Bracket (T9) (State bulb size)	**C2**
Pilot Adjustment Assembly	**D2**
Body with Cap Screws and Gaskets (Specify 15 psi g (1 bar) or below assembly or standard assembly)	**E2, F2, W**
Head & Guide Assembly w/ Gasket, Seat & Seat Gasket (Specify 15 psi g (1 bar) or below assembly or standard assembly)	**E2**

TI-P036-02
CTLS Issue 7

BX and BXRA Gunmetal Self-acting Control Valves

Description

The BX range of two-port valves are used in conjunction with Spirax Sarco SA control systems to provide a self-acting temperature control unit.

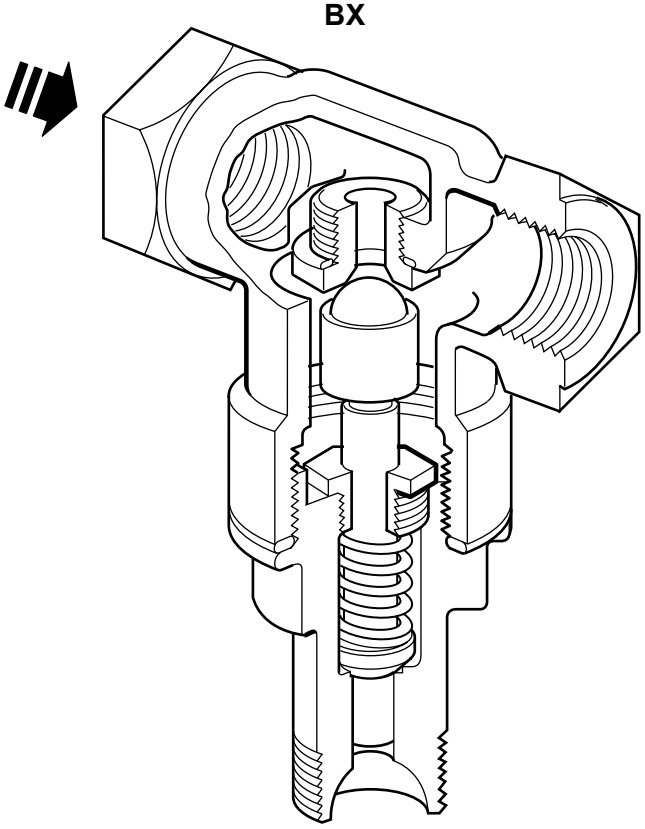
Available types

BX	Normally open, single seat with four different orifice sizes: **BX2, BX3, BX4 and BX6.**
BXRA	Normally closed, single seat.

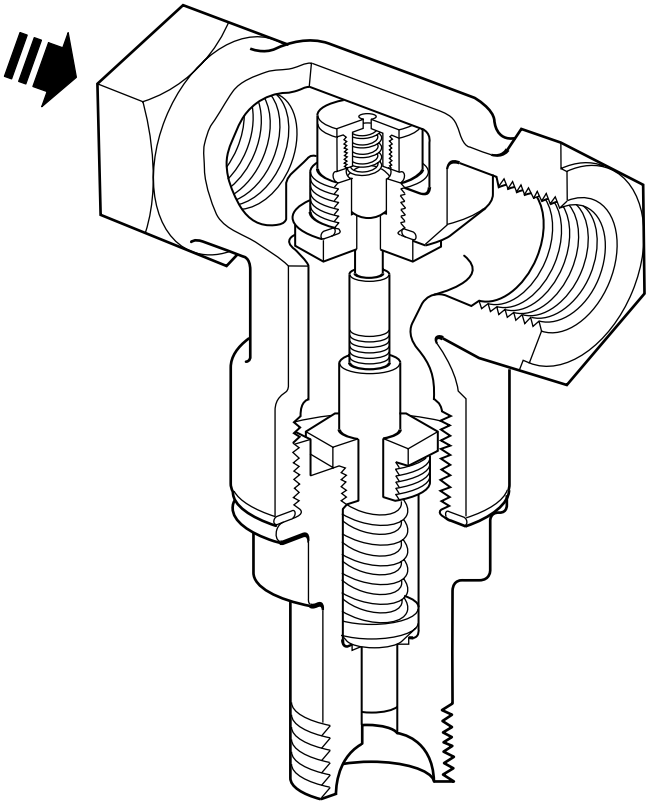
Sizes and pipe connections

½" screwed BSP (BS 21 parallel) or NPT.

BX

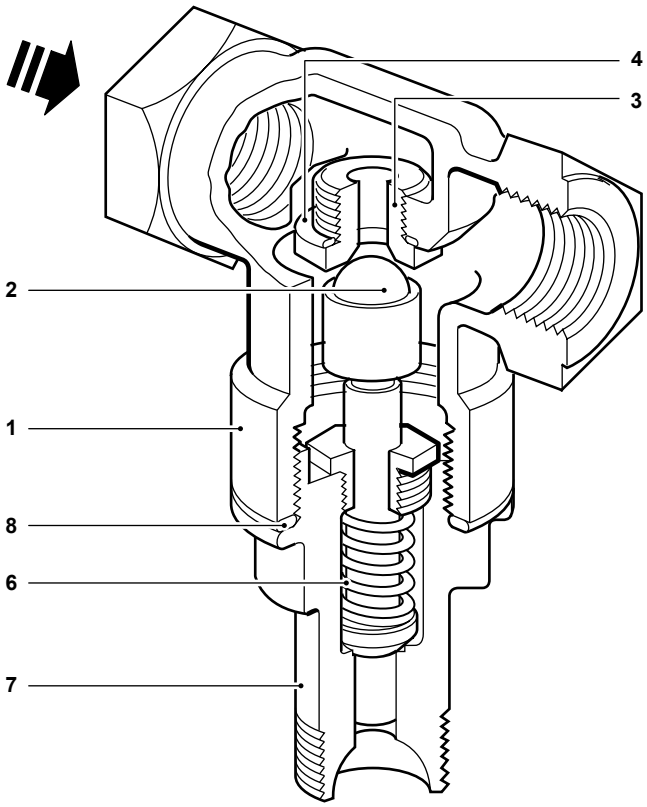


BXRA

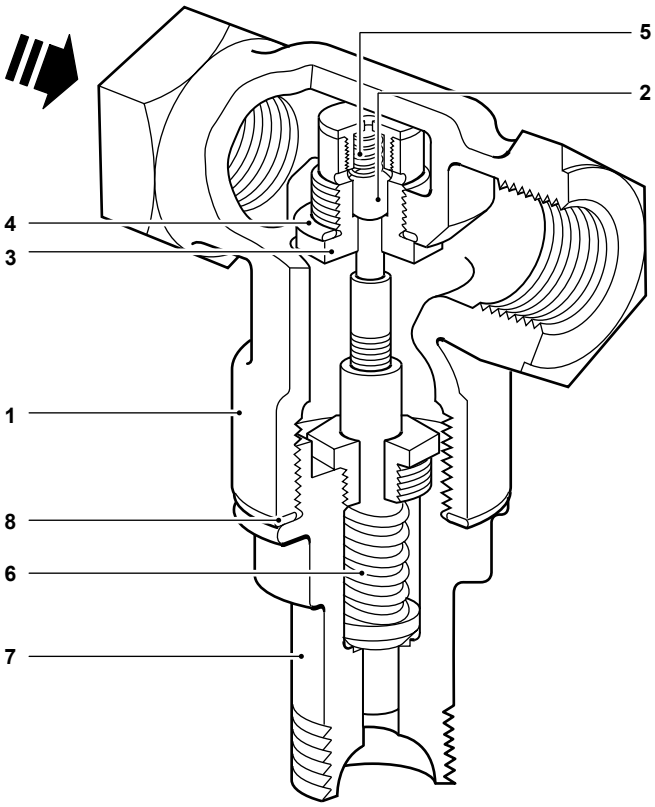


Materials

BX

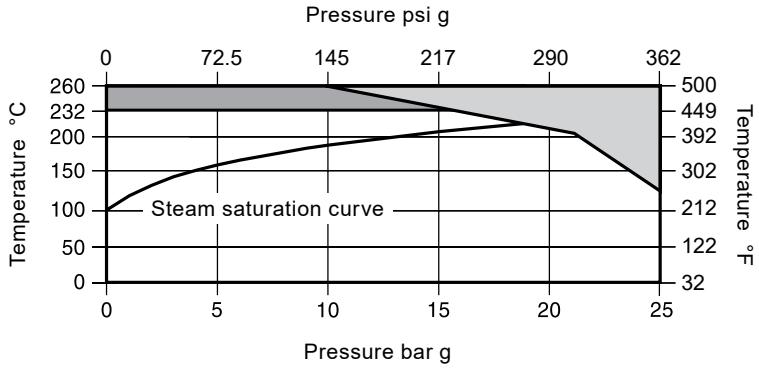


BXRA



No.	Part	Material	
1	Body	Gunmetal	CC491 K or CC491 K M
2	Valve closure member	Stainless steel	AISI 440B
3	Valve seat ring	Stainless steel	BS 970 431 S29
4	Valve seat gasket	Copper	BS 2870 C102
5	Ball return spring	Stainless steel	BS 2056 302 S26
6	Main return spring	Stainless steel	BS 2056 302 S26
7	Bonnet	Brass	BS 2872 CZ 122
8	Bonnet gasket	Reinforced exfoliated graphite	

Pressure/temperature limits



The product **must not** be used in this region.

When the valve is operated with a self-acting temperature control system in this region, a Spirax Sarco spacer must be used.

Body design conditions			PN25
Maximum design temperature	Fitted to a Spirax Sarco spacer	260 °C	500 °F
	Fitted directly to an actuator	232 °C	450 °F
Maximum differential pressure	BX	17.2 bar	250 psi
	BXRA	10.3 bar	150 psi
Designed for a maximum cold hydraulic test pressure of:		38 bar g	550 psi g

K_V values

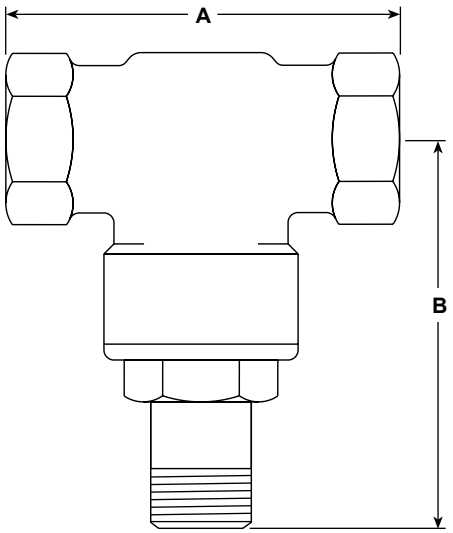
BX2	BX3	BX4	BX6	BXRA
0.38	0.64	1.03	1.65	0.59

For conversion:
C_V (UK) = K_V x 0.963
C_V (US) = K_V x 1.156

Capacities

For saturated steam sizing capacities, see TI-GCM-08.
For water sizing capacities, see TI-GCM-09.

Dimensions / weights (approximate) in mm (inches) and kg (lbs)



Size	A	B	Weight
½"	80 (3.15")	83 (3.15")	0.7 (1.54)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note:

The valve should be fitted in a horizontal line. The actuator position will depend on the type fitted to the valve.

How to order

Example: 1 off Spirax Sarco ½" screwed BSP BX4 self-acting control valve with gunmetal body and stainless steel trim.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

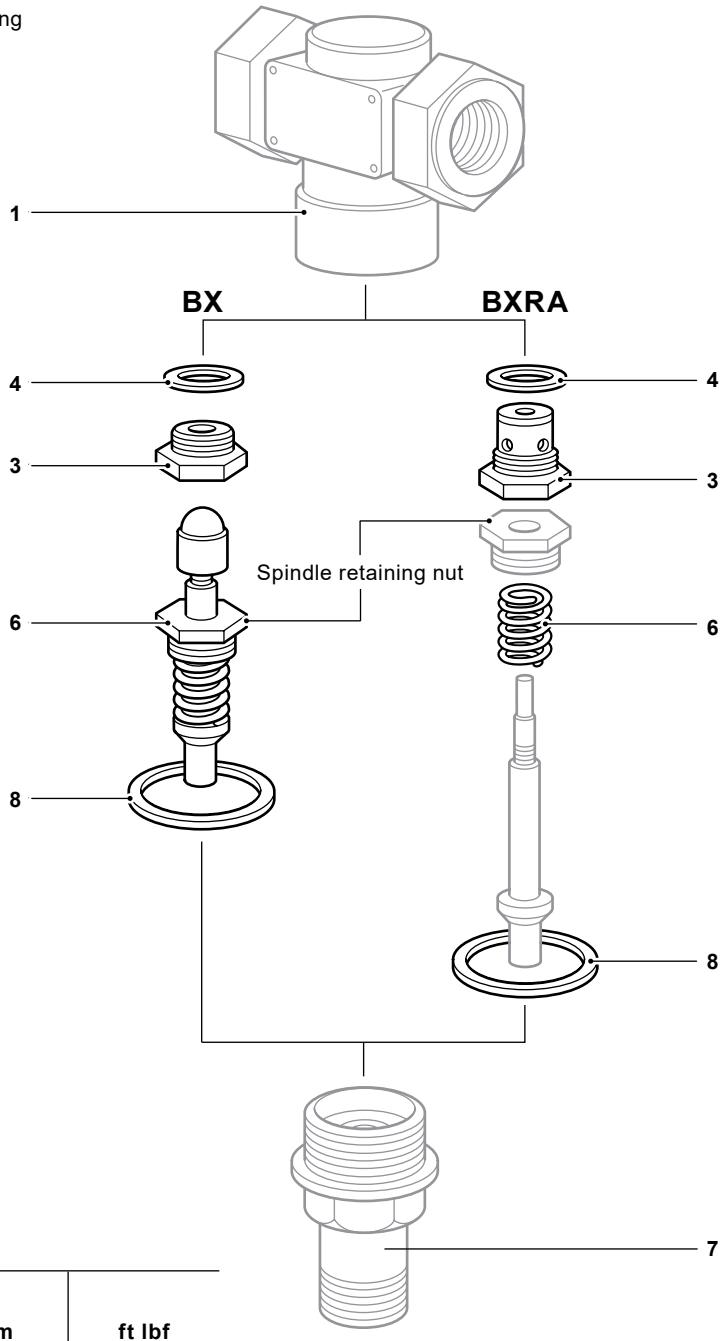
Available spares

Valve seat assembly	BX valve	**3, 4, 6, 8**
	BXRA valve	**3, 4, 6, 8**
Gasket set (packet of 3 each)		**4, 8**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of valve.

Example: 1 - Valve seat assembly for a ½" BXRA self-acting control valve.



Recommended tightening torques

Item	Part	or mm	N m	ft lbf
3	Valve seat	18 A/F	40 - 50	30 - 37
7	Bonnet		40 - 50	30 - 37

TI-P044-01
CTLS Issue 11

SB and SBRA
Gunmetal
Self-acting Temperature Control Valves

Description

The SB and SBRA range of two-port valve are used in conjunction with Spirax Sarco SA control systems to provide a self-acting temperature control unit.

Available types:

SB	Normally open, single seat valve
SBRA	Normally closed, single seat valve or single seat valve with bleed

Optional extras

Extra bleed hole bypass

Standards

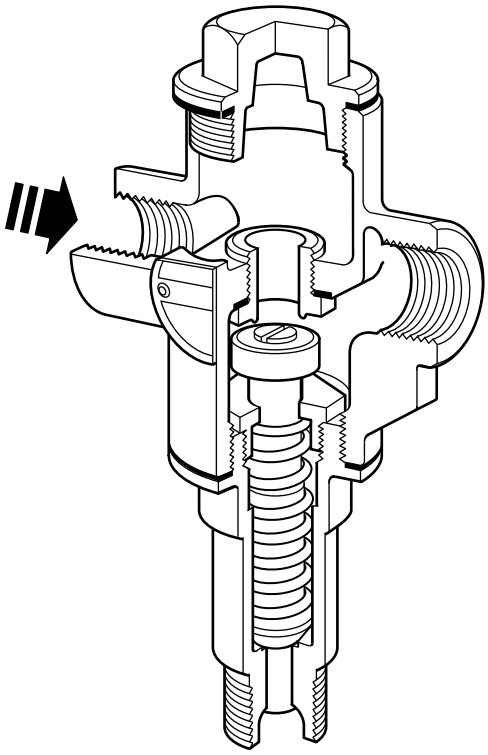
These products fully comply with the requirements of the Pressure Equipment Directive (PED) and carry the CE mark when so required.

Certification

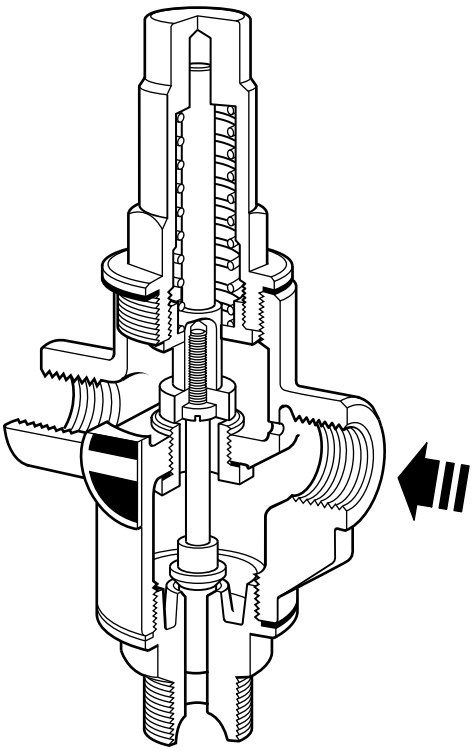
The product is available with manufacturer's Typical Test Report.
Note: All certification / inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

DN15, DN20, and DN25 (1/2", 3/4", and 1") screwed BSP (BS 21 parallel) or NPT.

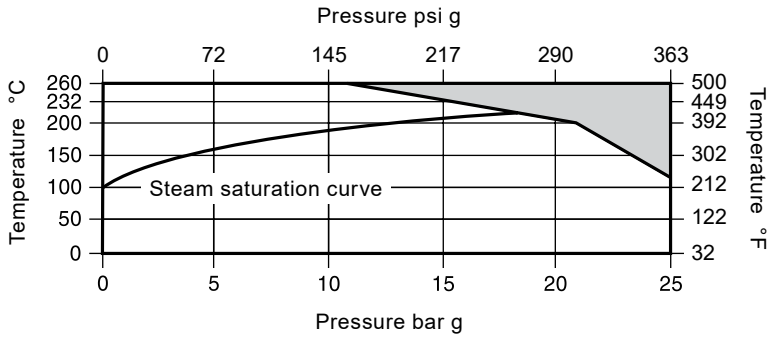


SB



SBRA

Pressure/temperature limits



The product **must not** be used in this region.

Body design conditions				PN25
Maximum design pressure				25 bar g @ 120 °C (363 psi g @ 248 °F)
Maximum design temperature		Fitted directly to an actuator		232 °C (450 °F)
Minimum design temperature				-10 °C (14 °F)
Maximum operating temperature		Fitted directly to an actuator		232 °C (450 °F)
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco				0 °C (32 °F)
Maximum differential pressure bar (psi)	**Size**	**DN15 (1/2")**	**DN20 (3/4")**	**DN25 (1")**
	SB	17.2 (250)	10.3 (150)	6.8 (99)
	SBRA	12.0 (174)	7.0 (102)	4.7 (68)
Designed for a maximum cold hydraulic test pressure of				38 bar g (551 psi g)

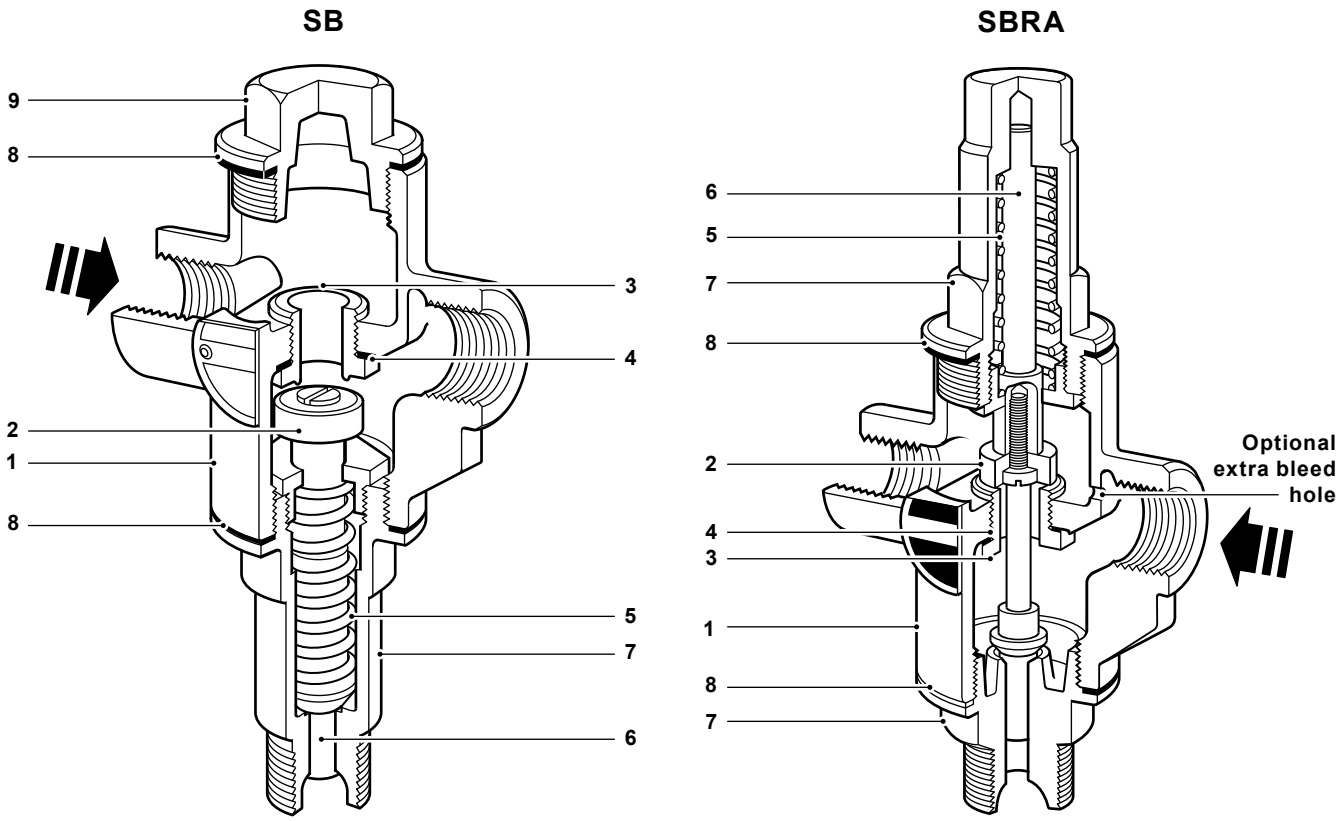
Kv values

DN15 (1/2")	DN20 (3/4")	DN25 (1")	For conversion:
2.58	3.86	6.80	Cv (UK) = Kv x 0.963 Cv (US) = Kv x 1.156

Capacities

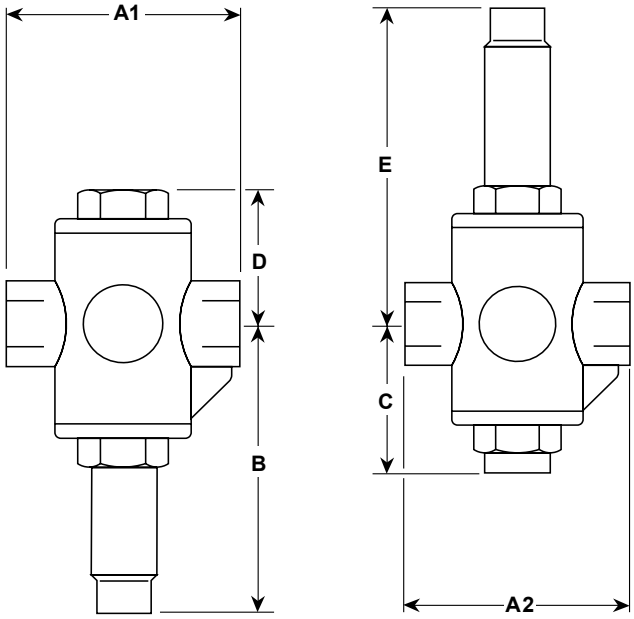
For saturated steam sizing capacities, see TI-GCM-08.
For water sizing capacities, see TI-GCM-09.

Materials



No.	Part	Material	
1	Body	Gunmetal	BS 1400 LG2
2	Valve plug	Stainless steel	BS 970 431 S29
3	Valve seat ring	Stainless steel	BS 970 431 S29
4	Valve seat gasket	Copper	BS 2870 C102
5	Return spring	Stainless steel	BS 2056 302 S26
6	Stem	Brass	BS 2874 CZ 121
7	Bonnet	Brass	BS 2872 CZ 122
8	Bonnet gasket	Reinforced exfoliated graphite	
9	Cap	Brass	BS 2872 CZ 122

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



SB SBRA

Size	A1	A2	B	C	D	E	Weight
DN15	79 (3.1)	79 (3.1)	101 (4.0)	66 (2.6)	50 (2.0)	95 (3.7)	1.0 (2.2)
DN20	95 (3.7)	79 (3.1)	101 (4.0)	66 (2.6)	50 (2.0)	95 (3.7)	1.3 (2.9)
DN25	105 (4.1)	79 (3.1)	101 (4.0)	66 (2.6)	50 (2.0)	95 (3.7)	1.5 (3.3)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note:

The valve should be fitted in a horizontal line. The actuator position will depend on the type fitted to the valve.

How to order

Example: 1 off Spirax Sarco 1" SB self-acting temperature control valve with bronze body having screwed BSP connections.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

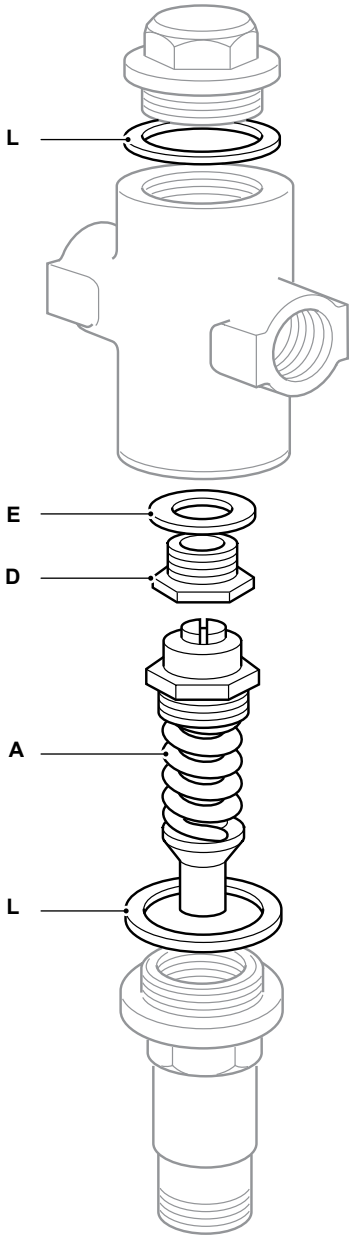
Available spares

Valve seat and stem assembly	SB	**A, D, E, L**
	SBRA	**A1, D1, E, T1, R, S**
Set of all gaskets	SB	**E, L**
	SBRA	**L1, L2, E**

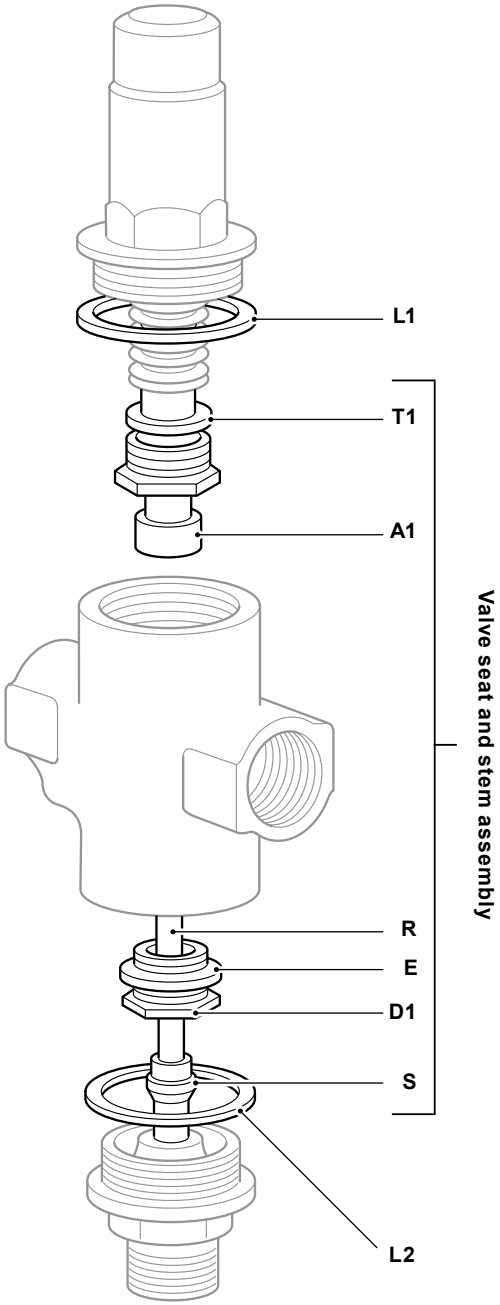
How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of valve.

Example: 1 - Valve seat and stem assembly for a ¾" SBRA self-acting temperature control valve.



SB



SBRA

TI-P036-01
CTLS Issue 7

BM, BMRA, BMF and BMFRA Self-acting Control Valves

Description and available types

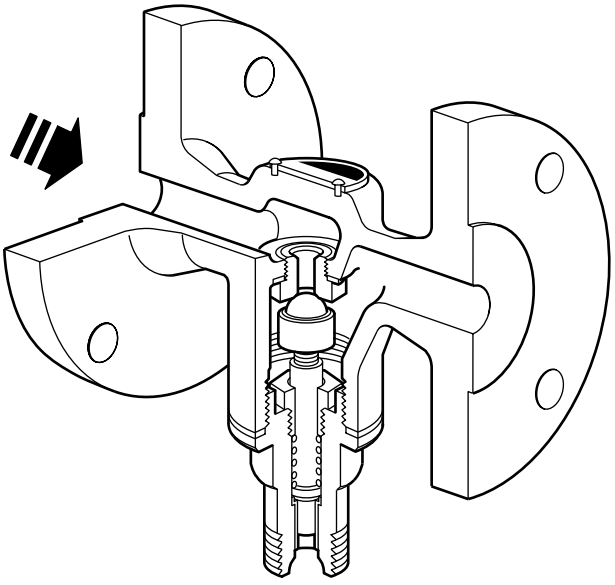
BM	Cast steel, normally open, single seat with 4 orifice sizes: **BM2, BM3, BM4 and BM6.**
BMRA	Cast steel, normally closed, single seat.
BMF	Cast iron, normally open, single seat with 4 orifice sizes: **BMF2, BMF3, BMF4 and BMF6**.
BMFRA	Cast iron, normally closed, single seat.

Sizes and pipe connections

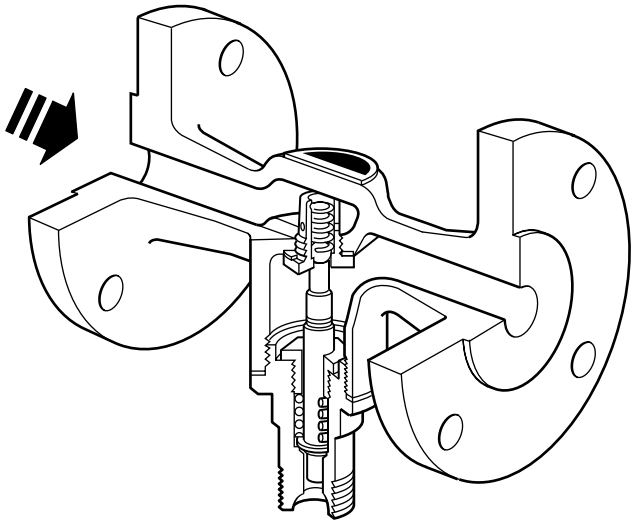
BM and BMRA	DN15 (½") standard flange:	EN 1092 PN25 and ANSI 300

Note: ANSI 150 connections are available to special order for both BM and BMRA self-acting control valves.

BMF and BMFRA	DN15 (½") standard flange:	EN 1092 PN16

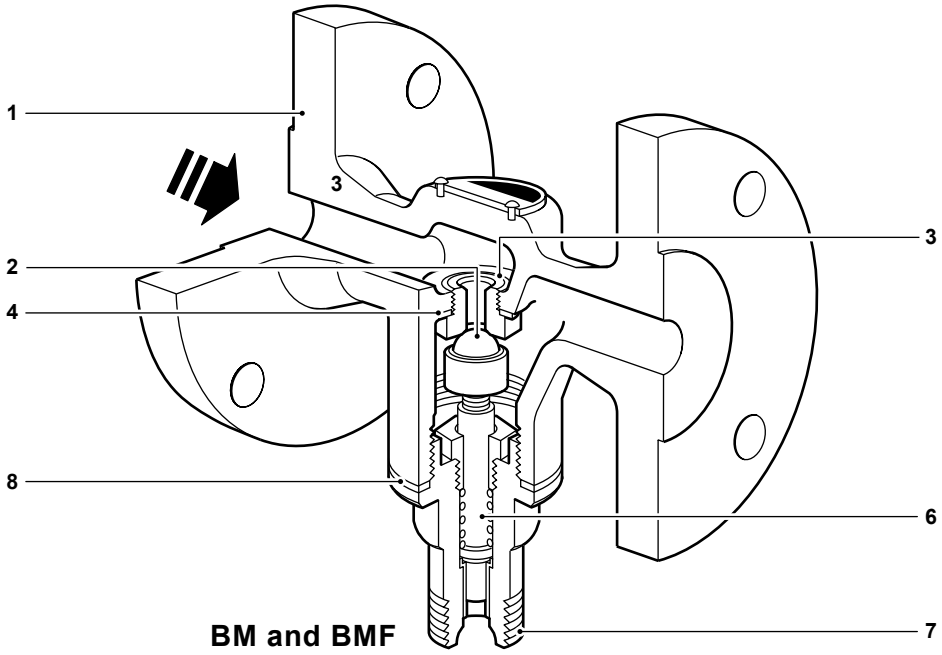


BM and BMF

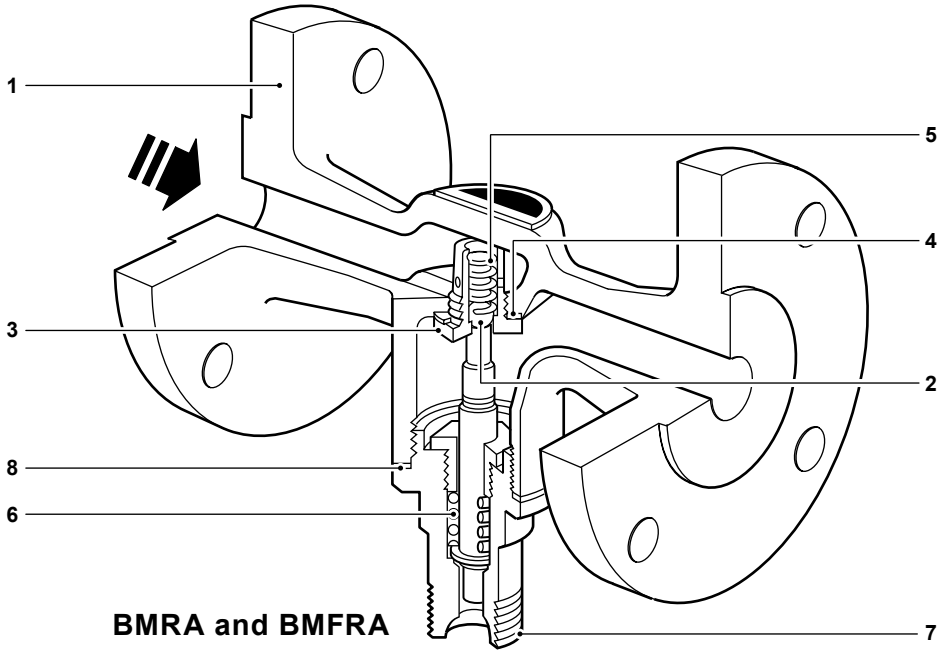


BMRA and BMFRA

Materials



BM and BMF

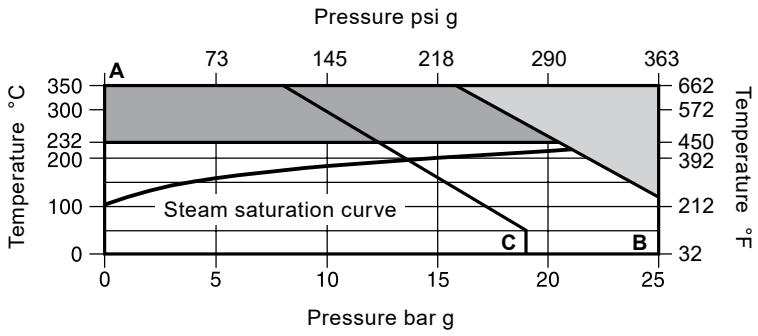


BMRA and BMFRA

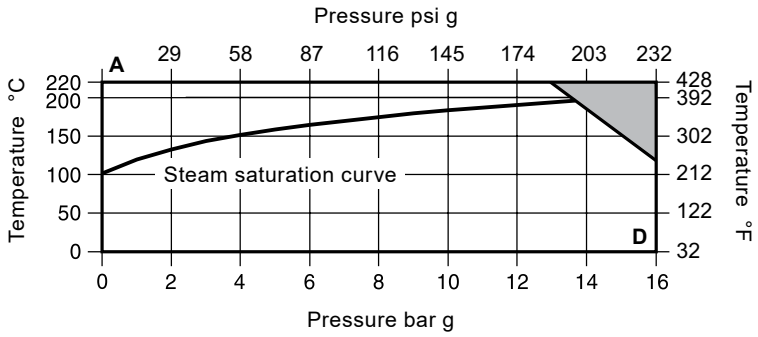
No.	Part		Material	
1	Body	**BMF**	Cast iron	DIN 1691 GG 20
		BM	Cast steel	DIN 17245 GS C25
2	Valve closure member		Stainless steel	AISI 440 B
3	Valve seat ring		Stainless steel	BS 970 431 S29
4	Valve seat gasket		Mild steel	BS 1449 CS4
5	Ball return spring		Stainless steel	BS 2056 302 S26
6	Main return spring		Stainless steel	BS 2056 302 S26
7	Bonnet		Steel	DIN 17243 C22.8
8	Bonnet gasket		Reinforced exfoliated graphite	

Pressure/temperature limits

BM and BMRA



BMF and BMFRA



The product **must not** be used in this region.

When the valve is operated with a self-acting temperature control system in this region a Spirax Sarco spacer must be used in conjunction with the system.

A - B Flanged EN 1092 PN25 and ANSI 300

A - C Flanged ANSI 150

A - D Flanged EN 1092 PN16

Body design conditions	BM and BMRA			PN25
	BMF and BMFRA			PN16
Maximum design temperature	BM and BMRA	Fitted to a Spirax Sarco spacer	350 °C	662 °F
		Fitted directly to the actuator	232 °C	450 °F
	BMF and BMFRA		220 °C	428 °F
Maximum differential pressure	BM		17.2 bar	247 psi
	BMRA		10.3 bar	149 psi
	BMF		16.0 bar	232 psi
	BMFA		10.3 bar	149 psi
Designed for a maximum cold hydraulic test pressure of:	BM and BMRA		38 bar g	551 psi g
	BMF and BMFRA		24 bar g	348 psi g

Kv values

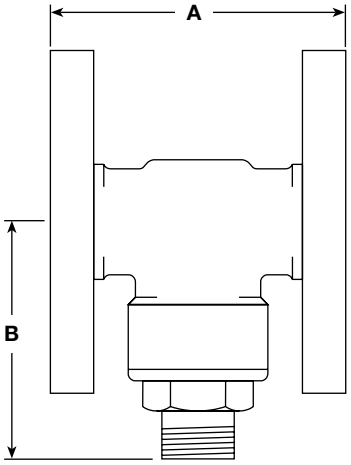
BM2 BMF2	BM3 BMF3	BM4 BMF4	BM6 BMF6	BMRA BMFRA
0.38	0.64	1.03	1.65	0.59

For conversion:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

Capacities

For saturated steam sizing capacities, see TI-GCM-08.
For water sizing capacities, see TI-GCM-09.

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	BS 4504 DIN PN16 and PN25 A	ANSI 300 A	B	Weight
DN15 (½")	130 (5.1)	127 (5)	87 (3.4)	3.6 (8)

Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-S21-01) supplied with the product.

Installation note
The valve should be fitted in a horizontal line. The actuator position will depend on the type fitted to the valve.

Maintenance note
How to fit general:

- Remove the control system sensor from the plant and allow it to cool (SA systems).
- Disconnect the actuator from the valve.
- Before attempting to carry out any repairs, make sure that the valve is fully isolated.
- It is important always to renew the complete assembly as listed in 'Spare parts' and to make sure that all the joint faces are clean.
- Always reassemble using new gaskets lightly coated with a suitable jointing compound (preferably of a non-graphited type).

Valve seat assembly:

- To replace the valve seat assembly unscrew the bonnet (**7**).
- Remove the valve seat (**3**) from the body (**1**) and replace it with a new one using a box spanner 18 mm A/F.
- Unscrew the spindle retaining nut and withdraw it from the bonnet ball head and spindle assembly. The ball head and spindle assembly of the BM and BMF valves are preassembled and set to the correct length. No further adjustment is necessary.
- Replace the new assembly or spring (BMRA and BMFRA).
- Tighten the spindle retaining nut.
- Refit the bonnet to the valve body using a new gasket.

How to order
Example: 1 off Spirax Sarco DN15 BMRA self-acting control valve having flanged EN 1092 PN25 connections.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

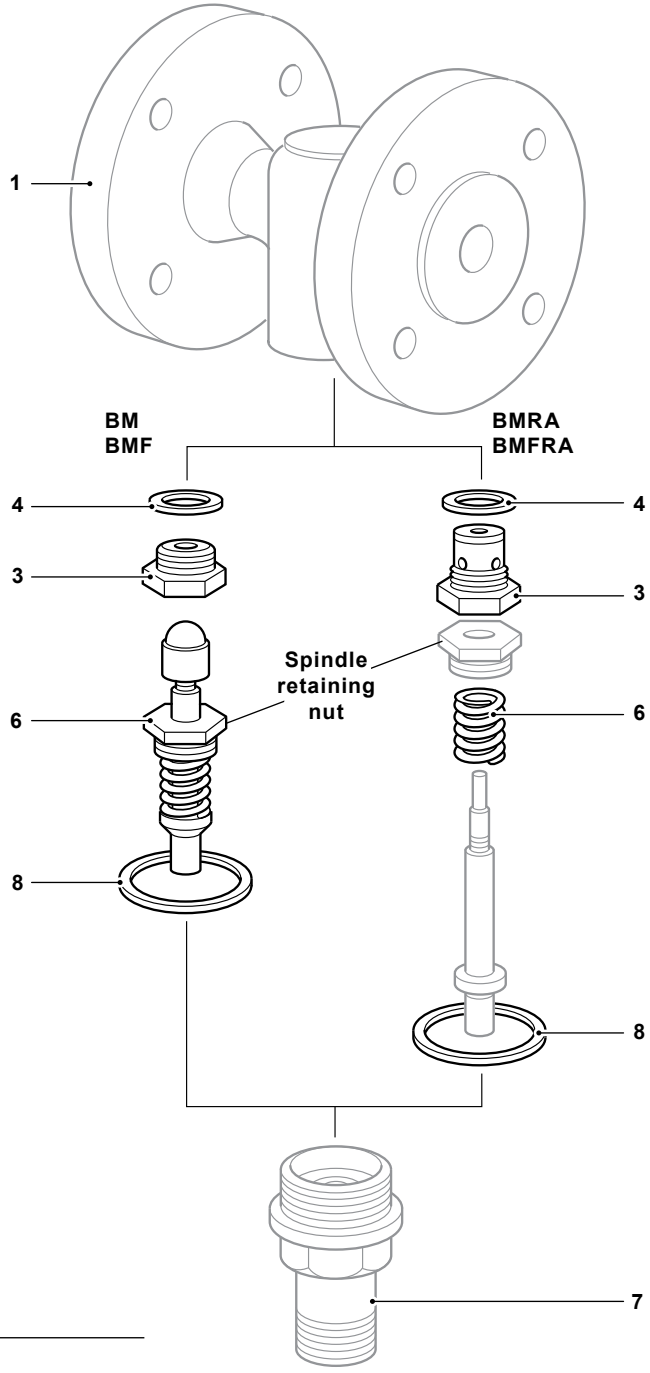
Available spares

Valve seat assembly	BM and BMF	**3, 4, 6, 8**
	BMRA and BMFRA	**3, 4, 6, 8**
Gasket set	(3 of each in a packet)	**4, 8**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of valve.

Example:
1 - Valve seat assembly for a DN15 BMRA self-acting control valve.



Recommended tightening torques

Item	Part	or mm	N m	ft lbf
3	Valve seat	18 A/F	40 - 50	30 - 37
7	Bonnet		70 - 80	52 - 59

TI-P078-06
CTLS Issue 9

KA43, KB43 and KC43 Steel Self-acting Control Valves

Description

The KA, KB and KC range of two-port valves are used in conjunction with Spirax Sarco SA control systems to provide a self-acting temperature control unit.

Available types

KA43	Normally open with flanged connections.
KB43	Normally open with phosphor bronze pressure balancing bellows with flanged connections.
KC43	Normally open with stainless steel pressure balancing bellows with flanged connections.

Note: Pressure balancing bellows enables the valve to operate against higher differential pressures.

Standards

These products fully comply with the requirements of the European Pressure Equipment Directive 2014/68/EU and carry the CE mark when so required.

Certification

As standard these products are available with a manufacturers' Typical Test Report. Additionally, at extra cost, certification to EN 10204 3.1 can be supplied.
Note: All certification / inspection requirements must be stated at the time of order placement.

Size and pipe connections

KA43 DN15, DN20, DN25, DN32, DN40 and DN50 (½", ¾", 1", 1¼", 1½" and 2")

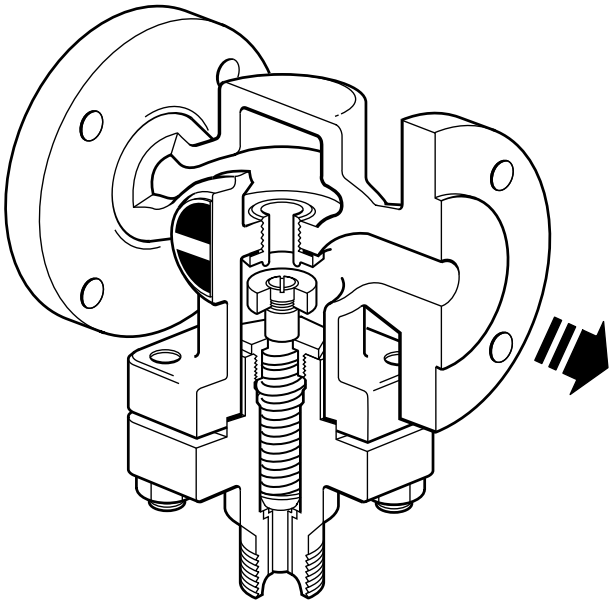
KB43 DN25, DN32, DN40 and DN50 (1", 1¼", 1½" and 2")

KC43 DN32, DN40 and DN50 (1¼", 1½" and 2")

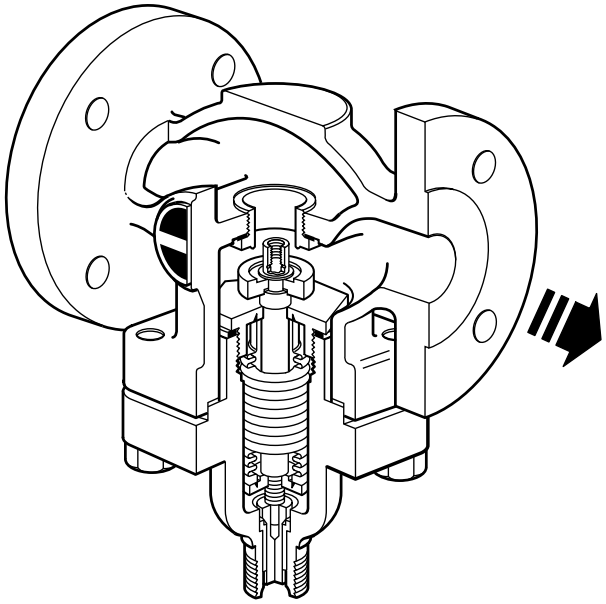
Standard flanges:
EN 1092 PN25 and EN 1092 PN40, ASME 300 and BS 10 Table H.

The following flanges are available on request:

- ASME 150
- JIS/KIS10
- JIS/KIS20

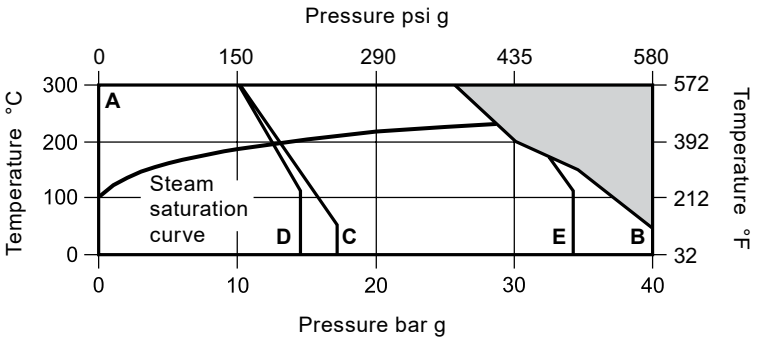


KA43



KB43 and KC43

Pressure/temperature limits



The product **must not** be used in this region.

A - B Flanged EN 1092 PN40, ASME 300 and BS 10 Table H.

A - C Flanged EN 1092 PN25 and ASME 150

A - D Flanged JIS/KS 10

A - E Flanged JIS/KS 20

3.1

32

Body design conditions			PN40
Maximum design pressure		40 bar g @ 20 °C	580 psi g @ 68 °F
Maximum design temperature		300 °C @ 25.8 bar g	572 F @ 374 psi g
Minimum design temperature		-10 °C	14 °F
Maximum operating temperature	**A - B**	300 °C @ 25.8 bar g	572 °F @ 374 psi g
	A - C	300 °C @ 10.0 bar g	572 °F @ 145 psi g
	A - D	300 °C @ 10 bar g	572 °F @ 145 psi g
	A - E	300 °C @ 25.8 bar g	572 °F @ 374 psi g
Minimum operating temperature **Note**: For lower operating temperatures consult Spirax Sarco			0 °C

Maximum differential pressure bar	**Size**	**DN15 (½")**	**DN20 (¾")**	**DN25 (1")**	**DN32 (1¼")**	**DN40 (1½")**	**DN50 (2")**
	KA43	17.0 (247)	10.0 (145)	4.5 (65)	3.0 (44)	2.0 (29)	1.5 (22)
	KB43			10.0 (145)	9.0 (131)	8.2 (119)	6.9 (100)
	KC43				16.0 (232)	16.0 (232)	13.8 (200)

Designed for a maximum cold hydraulic test pressure of:	24 bar g (348 psi g)

Kv values

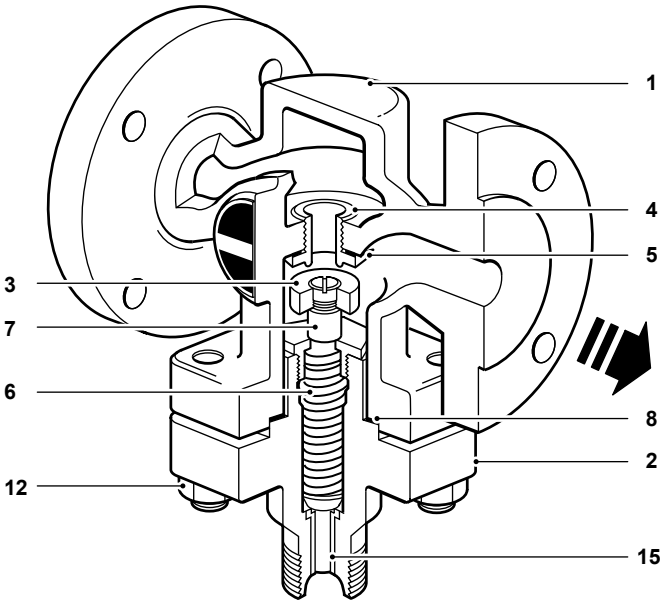
Size	**DN15 (½")**	**DN20 (¾")**	**DN25 (1")**	**DN32 (1¼")**	**DN40 (1½")**	**DN50 (2")**
KA43	2.90	4.64	9.80	16.48	23.70	34.00
KB43	-	-	9.80	16.48	23.70	34.00
KC43	-	-	-	16.48	16.48	34.00

For conversion:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

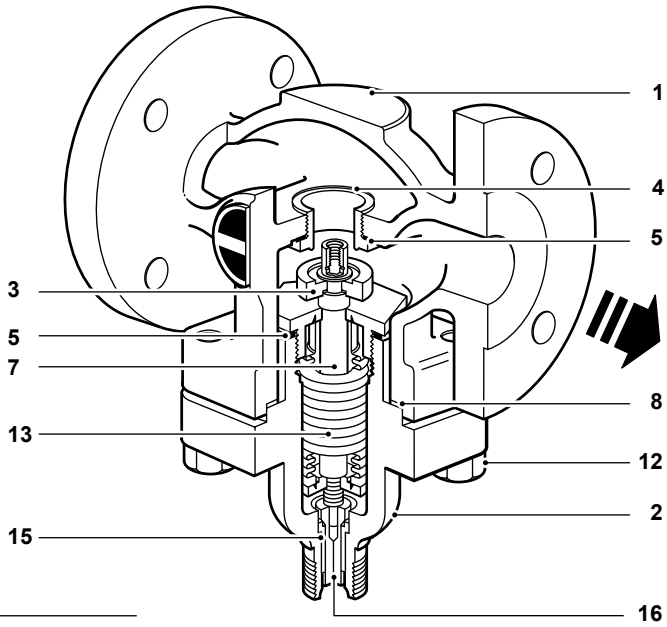
Capacities

For saturated steam sizing capacities see TI-GCM-08.
For water valve sizing capacities see TI-GCM-09.

Materials



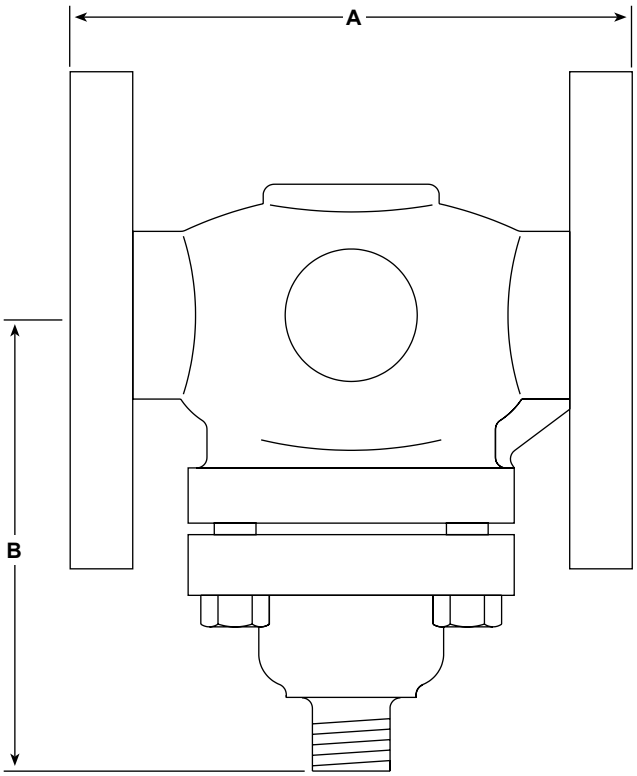
KA43



KB43 and KC43

No.	Part		Material	
1	Body		Steel	EN 10213 GP240 GH+N
2	Bonnet	DN15 - DN25	Steel	DIN 17243 C22.8
		DN32 - DN50	Steel	EN 10213 GP240 GH+N
3	Valve head		Stainless steel	BS 970 431 S29
4	Valve seat ring		Stainless steel	BS 970 431 S29
5	Valve seat gasket	DN15 to DN25	Mild steel	BS 1449 CS 4
		DN32 to DN50	Reinforced exfoliated graphite	
6	Return spring		Stainless steel	BS 2056 302 S 26
7	Stem	KA and KB	Brass	BS 2872 CZ 121
		KC	Stainless steel	BS 970 321 S20
8	Bonnet gasket		Reinforced exfoliated graphite	
12	Bonnet studs		Steel	BS 4439 Gr. 8.8
	Bonnet nuts		Steel	BS 3692 Gr. 8
13	Bellows	KB	Phosphor bronze	EN 12449 Cu Sn 6
		KC	Stainless steel	AISI 316 L
14	Bellows gasket (not shown)		Reinforced exfoliated graphite	
15	Bonnet bush		Brass	BS 2874 CZ 121
16	Plunger		Brass	BS 2874 CZ 121

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	JIS10	JIS20	PN25 PN40 A	ASME 300 A	Table 'H' A	KA43 B	KB43 KC43 B	Weight KA43	Weight KB43/ KC43
DN15	125 (4.92)	127 (5)	130 (5.12)	130 (5.12)	130 (5.12)	105 (4.13)		4.3 (9.5)	
DN20	145 (5.7)	147 (5.78)	150 (5.91)	150 (5.91)	146 (5.75)			6.3 (14)	
DN25	155 (6.1)	157 (6.18)	160 (6.30)	162 (6.38)	162 (6.38)		138 (5.43)	8.0 (18)	8.2 (18)
DN32	177 (6.96)	181 (7.13)	181 (7.13)	181 (7.13)	181 (7.13)	110 (4.33)	152 (5.43)	8.7 (19)	9.1 (20)
DN40	193 (7.59)	199 (7.83)	201 (7.91)	203 (8.00)	199 (7.83)			9.7 (21)	10.1 (22.3)
DN50	221 (8.7)	225 (8.85)	233 (9.17)	235 (9.25)	231 (9.09)			14.6 (32.2)	15.0 (33.1)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note:

The valve should be fitted in a horizontal line with the actuator vertically below the pipeline.

How to order

Example: 1 off Spirax Sarco DN20 KA43 self-acting control valve with steel body having flanged EN 1092 PN40 connections.

Spare parts

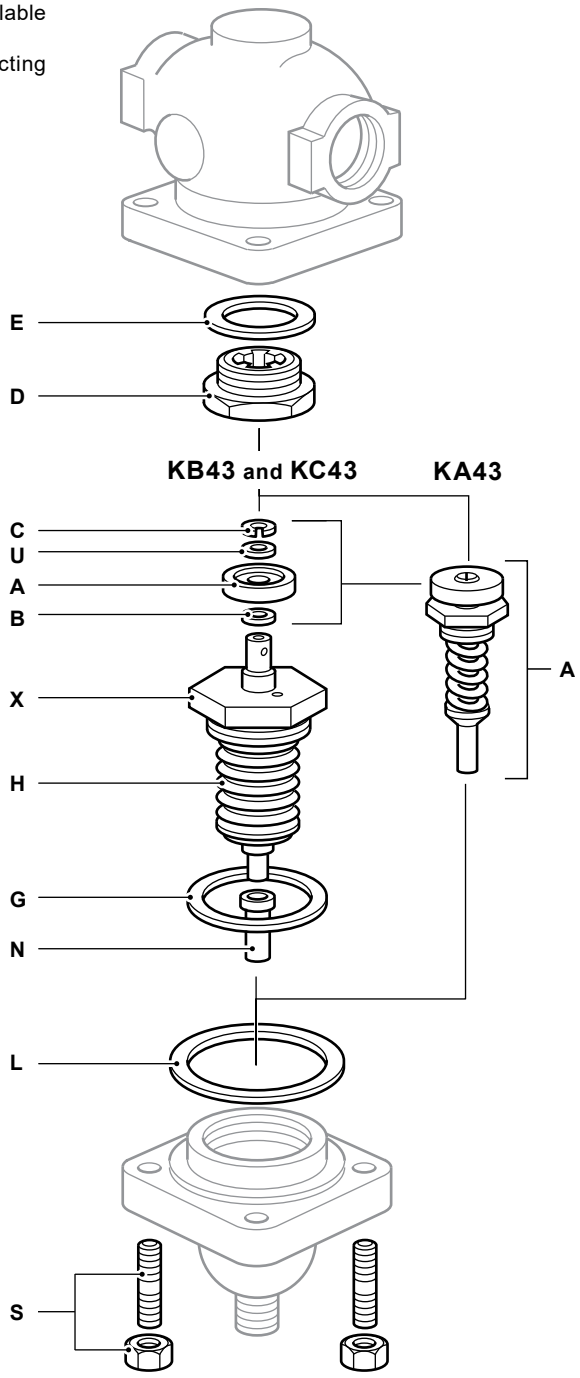
The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

KA43	Valve seat assembly	**A, D, E, L**
	Set of gaskets	**E, L**
	Set of bonnet studs and nuts (set of 4)	**S**
KB and KC43	Valve seat assembly (excluding bellows and stem assembly)	**A, B, C, D, E, L, U, G**
	Bellows and stem assembly	**G, L, N, H**
	Set of gaskets	**B, C, E, L, U, G**
	Set of bonnet studs and nuts (set of 4)	**S**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of valve.
Example: 1 - Valve seat assembly for a Spirax Sarco DN20 KB43 self-acting control valve.

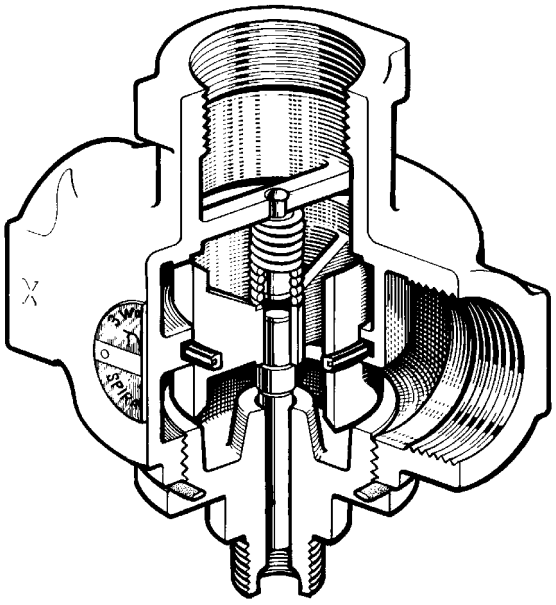


TI-P302-01-US
Issue 1

TW
3 Port Valve for Liquid Systems

Description
The TW is a 3-way self actuated temperature control valve which may be used on liquid systems as either a diversion valve for heating or cooling, or a mixing valve for blending hot and cold water.

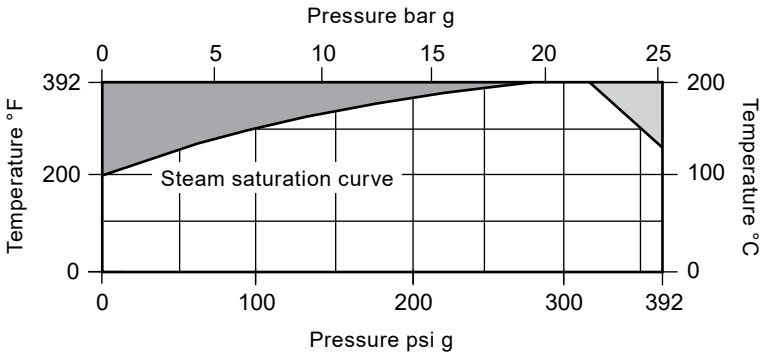
Model	TW
Sizes	¾", 1", 1-½" (DN20, DN25, DN40)
Connections	NPT
Construction	Bronze



Limiting operating conditions

Maximum differential pressure		
¾" to 1½" (DN20 - DN40)	50 psi	3.4 bar

Pressure/temperature limits



The product **must not** be used in this region.

The valves may be used in this region provided that the above maximum differential pressures are not exceeded. Valves with ANSI flanges must not be used above flange limits.

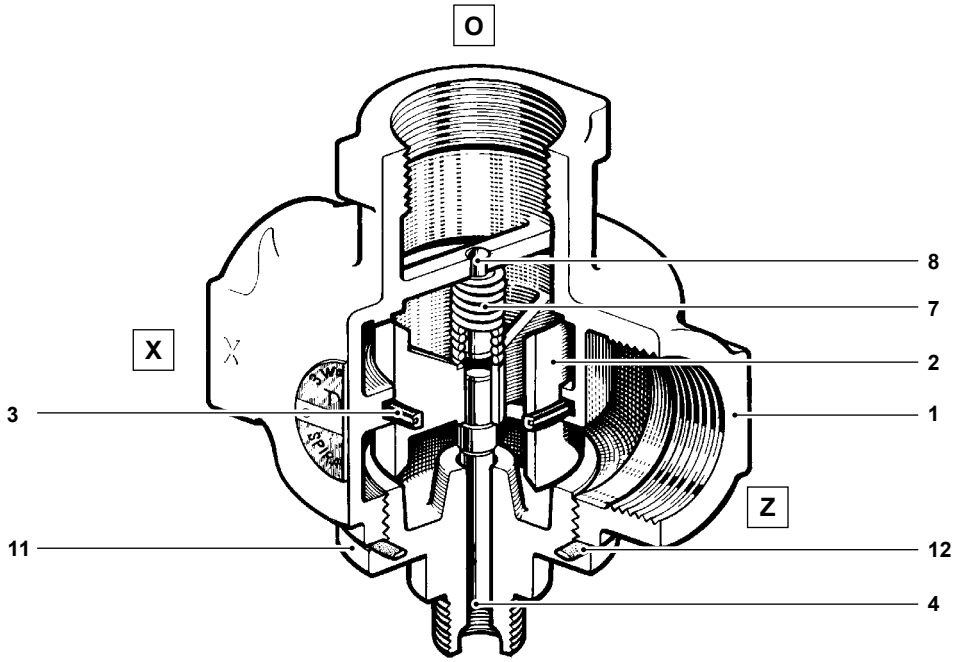
SHUTOFF: ANSI CLASS III

Pressure shell design conditions

PMA	Maximum allowable pressure	362 psi g up to 248 °F	25 bar g up to 120 °C
		319 psi g up to 392 °F	22 bar g up to 200 °C
TMA	Maximum allowable temperature	392 °F up to 319 psi g	200 °C up to 22 bar g

Typical applications
Industrial or commercial applications using water as a heating or cooling medium.

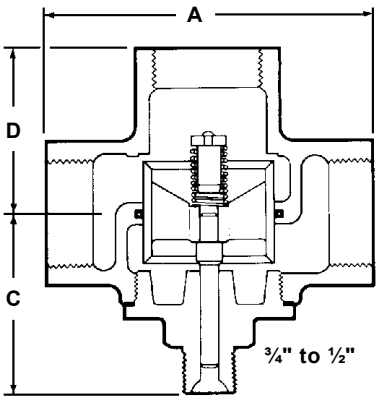
Materials



No.	Part	Material	Material Spec.	Closest Equivalent
1	Body	Bronze	BS 1400 LG2	B62 UNS 83600
2	Piston	Bronze	BS 1400 LG2	B62 UNS 83600
3	Piston sealing ring	Carbon Impregnated PTFE		
4	Stem	Brass	BS 2874 CZ 121	B16M
7	Return spring	Stainless steel	BS 2056 302 S26	A313 Type 302
8	Return spring plate	Brass	BS 2874 CZ 121	B16M
11	Bonnet	Brass	BS 2874 CZ 121	B16M
12	Bonnet gasket	Nickle reinforced exfoliated graphite		

Dimensions/weights (approximate) in inches (mm) and lbs (kg)

	Size	A	C	D	Weight
Screwed	¾"	3.8	2.3	2.1	2.7 lb
	(DN20)	(97)	(58)	(53)	(1.2 kg)
	1"	4.5	2.4	2.2	4.3 lb
	(DN25)	(114)	(61)	(56)	(2 kg)
	1½"	5.9	3.0	2.8	8.5 lb
	(DN40)	(151)	(76)	(71)	(3.9 kg)



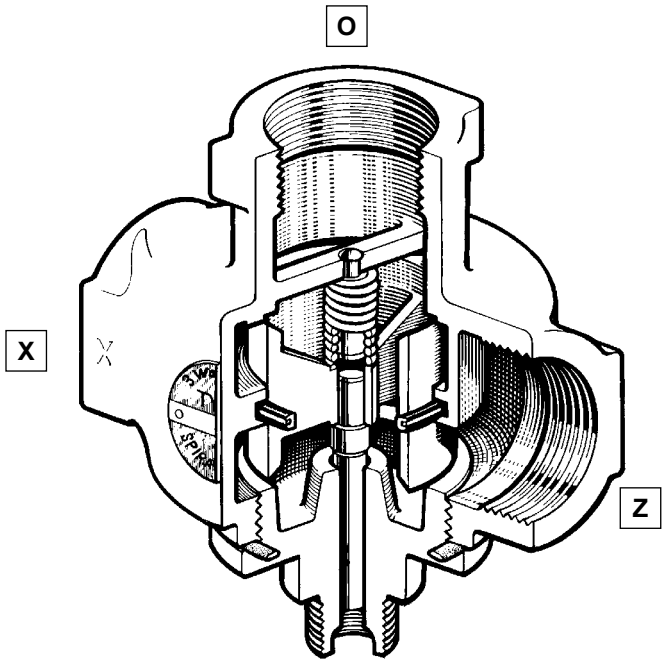
Sample specification

Control valve shall be bronze body, bronze trim, piston balanced 3 port with screwed connections. Valve shall achieve ANSI Class III Shutoff. Valve is coupled to the appropriate temperature control system. This combined unit is self acting and provides proportional control action. The temperature control system shall be brass with PVC covered capillary or stainless steel sensor and capillary, oil filled, hydraulically operated; and shall incorporate packless glands and a gas filled overheat protection device.
Temperature setting shall be adjustable while control is in service include, °F adjustment scale and shall incorporate a tamper proof device. When required, sensor bulb shall be mounted in a separable well for removal from the equipment.
Refer to TI-P046-01 for temperature control system details.

Piping arrangements

Application	Port 'O'	Port 'X'	Port 'Z'
Diversion valve - Heating	Flow in	to heating surface	to recirculation
Diversion valve - Cooling	Flow in	to recirculation	to cooling surface
Mixing valve	Blended Outlet	Hot flow in	Cold flow in

Note: Port 'X' closes on high temperature; port "Z' closes on low temperature; Port 'O' is always open



Cv Values

¾" (DN20)	1" (DN25)	1½" (DN40)	
5.4	10.5	24	For complete sizing information, see TI-P046-01

Installation

The valve should be installed in a horizontal section of pipe with the control system connection pointing vertically downward. Suitable stop valves should be provided to permit servicing, and Y-pattern strainers should be installed in the inlet piping. The valve ports are marked 'O', 'X' and 'Z', and piping instructions are supplied with each valve.

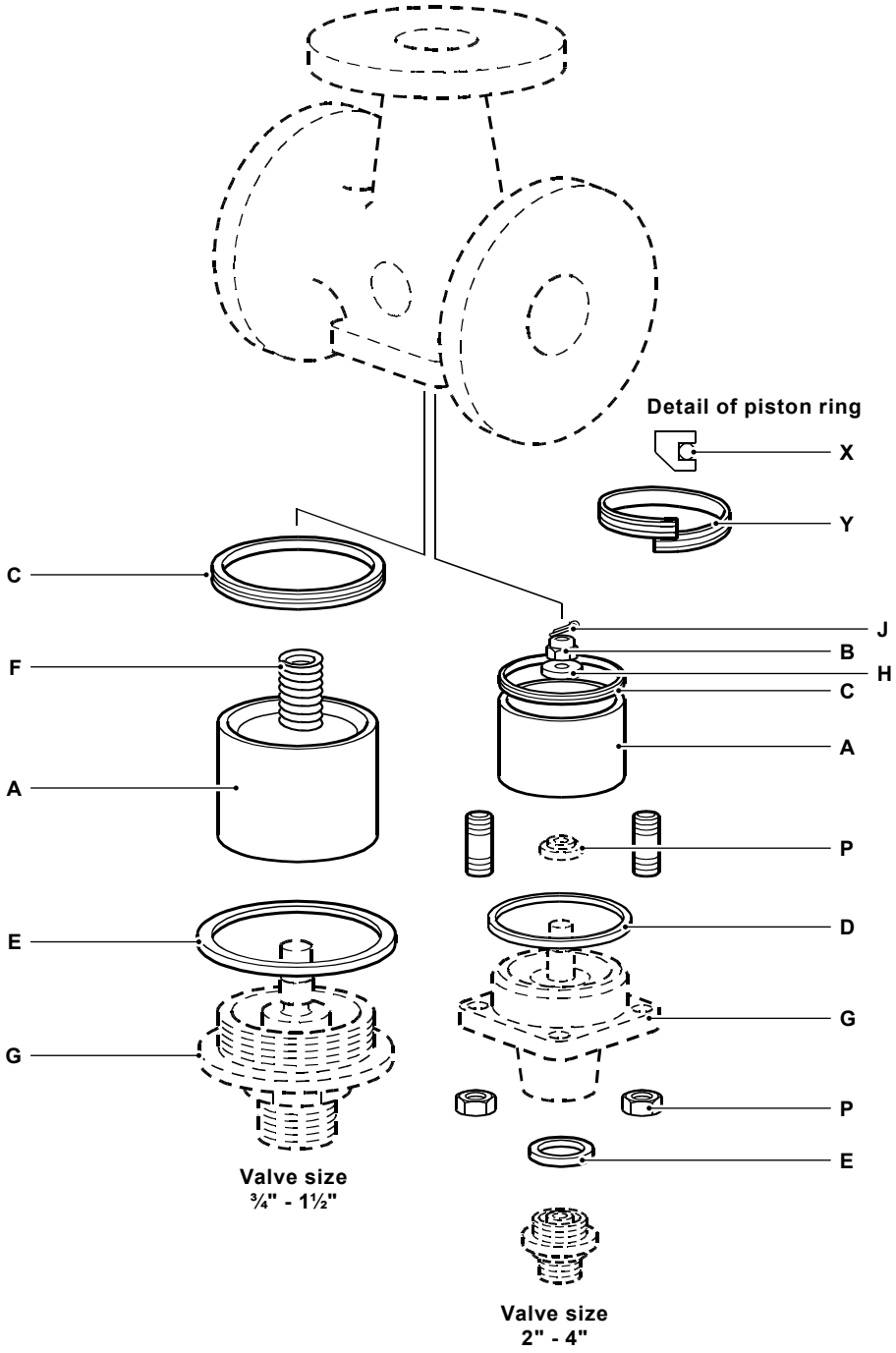
Maintenance

Except for periodic cleaning of the upstream strainer, maintenance or servicing is normally required only if a malfunction is detected. Complete installation and maintenance instructions are given in the IMI sheet, which accompanies the product.

Spare parts

Available spare parts are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Piston sealing ring 2", 3" (DN50, DN80)	**C, D, E**
Piston sealing ring ¾", 1½" (DN20, DN40)	**C, E, F**
Piston set ¾", 1½" (DN20, DN40)	**A, C, E, F**
Piston set 2", 3" (DN50, DN80)	**A, B, C, D, E, J, H**
Set of cover studs and nuts	**P**



TI-P046-01
CTLS Issue 22

SA121, SA122, SA128 and SA1219
Self-acting Temperature Control Systems

Description

A range of self-powered control systems that incorporate sensor, actuator, set point adjustment / indicator for use with the following valve types:-

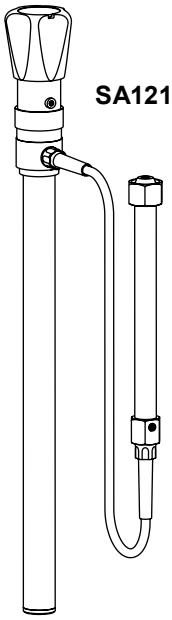
2-port	KA, KB, KC, KX, KY, SB, SBRA, BX and BXRA, BM, BMRA, BMF, BMFRA, NS and NSRA
3-port	TW

Available types

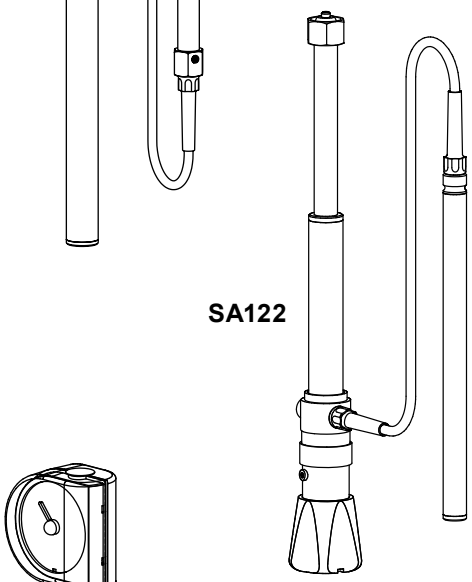
Set point adjustment at sensor				
SA121	For use on	2-port valves	DN15 to DN80	(½" to 3")
		3-port valves	DN20 to DN50	(¾" to 2")
SA1219	For use on	3-port valves	DN80 and DN100	(3" to 4")
SA128	For use on	2-port valves	DN15 to DN25	(½" to 1")
		3-port valves	DN20 and DN25	(¾" to 1")
Set point adjustment at valve				
SA122	For use on	2-port valves	DN15 to DN25	(½" to 1")
		3-port valves	DN20 and DN25	(¾" to 1")

Optional extras

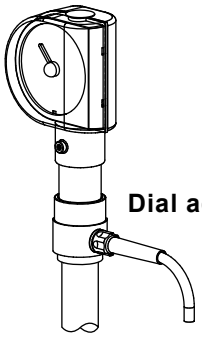
Union kit	Direct immersion
Pocket Pocket material stainless steel.	Indirect immersion
Wall bracket	
Duct adaptor	Duct mounting
Nickel plating	
Dial type set point adjuster	



SA121, SA1219 and SA128



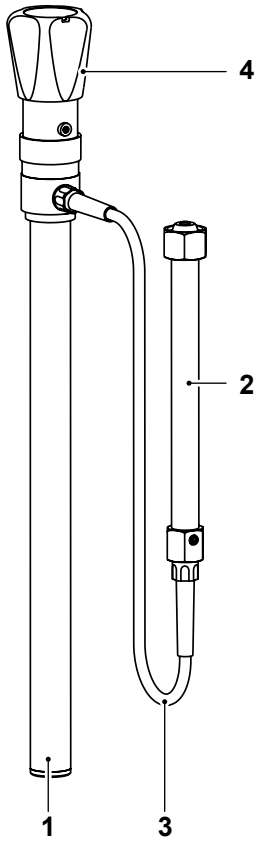
SA122



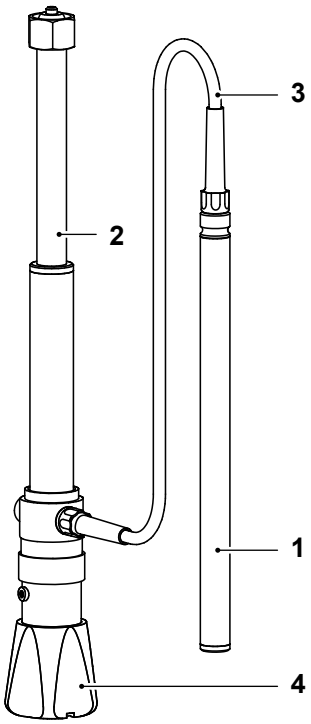
Dial adjustment option

Materials

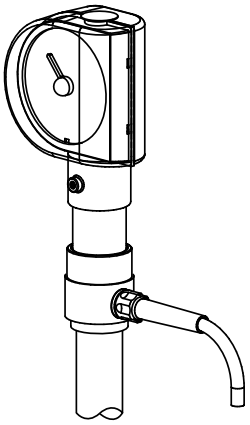
SA121, SA1219 and SA128



SA122



Dial adjustment option



No.	Part	Material	
1	Sensor	Brass	
2	Actuator	Brass	
3	Capillary tube	Copper with PVC coated armoured covering	
4	Adjustment head	Polypropylene	
5 *	Union kit	Brass	
6	Mounting bracket	Steel	
7	Clip	Polypropylene	
8 *	Adaptor plate (Duct fixing adaptor)	Steel	
9 *	Pocket	Stainless steel	BS 3605 CFS 316S 18
10	Liquid fill	Kerosene	

* Items **5**, **8** and **9** are shown on page 4

Temperature ranges

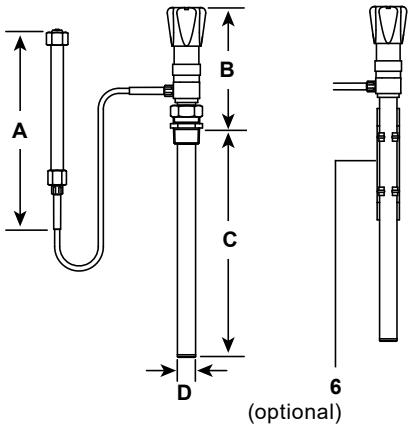
SA121 and SA1219	Range 1	-15 °C to 50 °C	(5 °F to 122 °F)
	Range 2	40 °C to 105 °C	(104 °F to 221 °F)
	Range 3	95 °C to 160 °C	(203 °F to 320 °F)
Over temperature protection		55 °C (131 °F) over set value to 190 °C (374 °F) maximum	
SA122	Range 1	-20 °C to 120 °C	(-4 °F to 248 °F)
	Range 2	40 °C to 170 °C	(104 °F to 338 °F)
Over temperature protection		55 °C (131 °F) over set value	
SA128	Range 1	-20 °C to 110 °C	(-4 °F to 230 °F)
	Range 2	40 °C to 170 °C	(104 °F to 338 °F)
Over temperature protection		55 °C (131 °F) over set value to 190 °C (374 °F) maximum	
Note - Ambient design temperature	Minimum	-35 °C	(-31 °F)
	Maximum	+50 °C	(122 °F)

Capillary tube

Standard length 2 m, 4 m, 8 m and maximum special length is 16m. (6.6 ft, 13.1 ft, 26.2 ft and 52.5 ft)

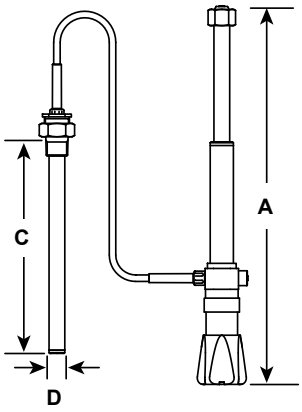
Dimensions/weights (approximate) in mm and kg

SA121, SA1219 and SA128

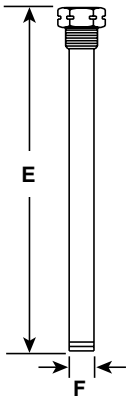


For a wall mounted sensor

SA122



Pockets

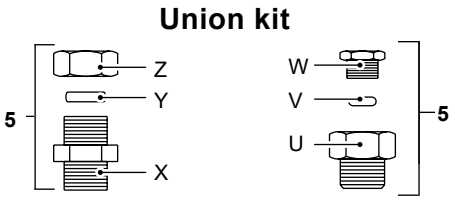


	Control system				Metal pockets		Weight
Model	**A**	**B**	**C**	**D**	**E**	**F**	excluding pocket
SA121	252 (9.9)	185 (7.3)	310 (12.2)	25 (1.0)	333 (13.1)	28 (1.1)	2.0 (4.4)
SA1219	350 (13.8)						2.3 (5.1)
SA122	441 (17.4)		240 (9.4)	17 (0.7)	271 (10.7)	20 (0.8)	1.8 (4.0)
SA128	252 (9.9)		178 (7)	25 (1.0)	196 (7.7)	28 (1.1)	1.8 (4.0)

Union kit (for sensor immersion without pocket)

Includes gland nut, compression ring and union nipple.

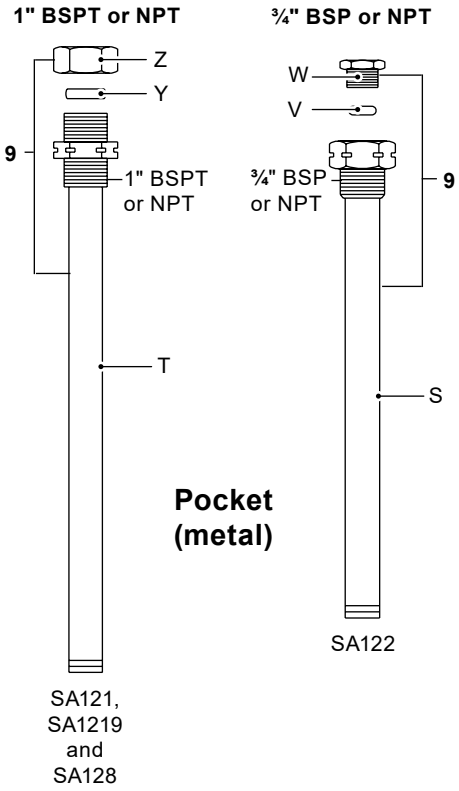
SA121, SA1219 and SA128	Items Z, Y and X
SA122	Items W, V and U



Pockets (for indirect immersion)

Includes pocket, gland nut and compression ring.

SA121, SA1219 and SA128	Items T, Z and Y
SA122	Items S, W and V.
Available materials	Stainless steel



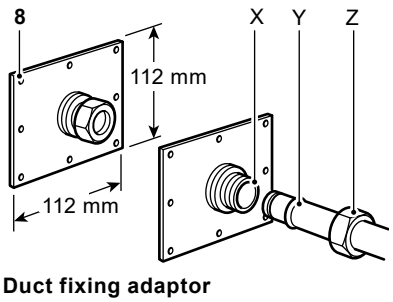
Wall mounting bracket (Item 6)

SA121, SA1219, SA122 and SA128	Optional

Duct fixing adaptor (for air sensing within ducts)

Includes adaptor plate, union nipple, compression ring and gland nut.

SA121, SA1219 and SA128	Items 8, X, Y and Z
SA122	Not available



Duct fixing adaptor

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

How to order

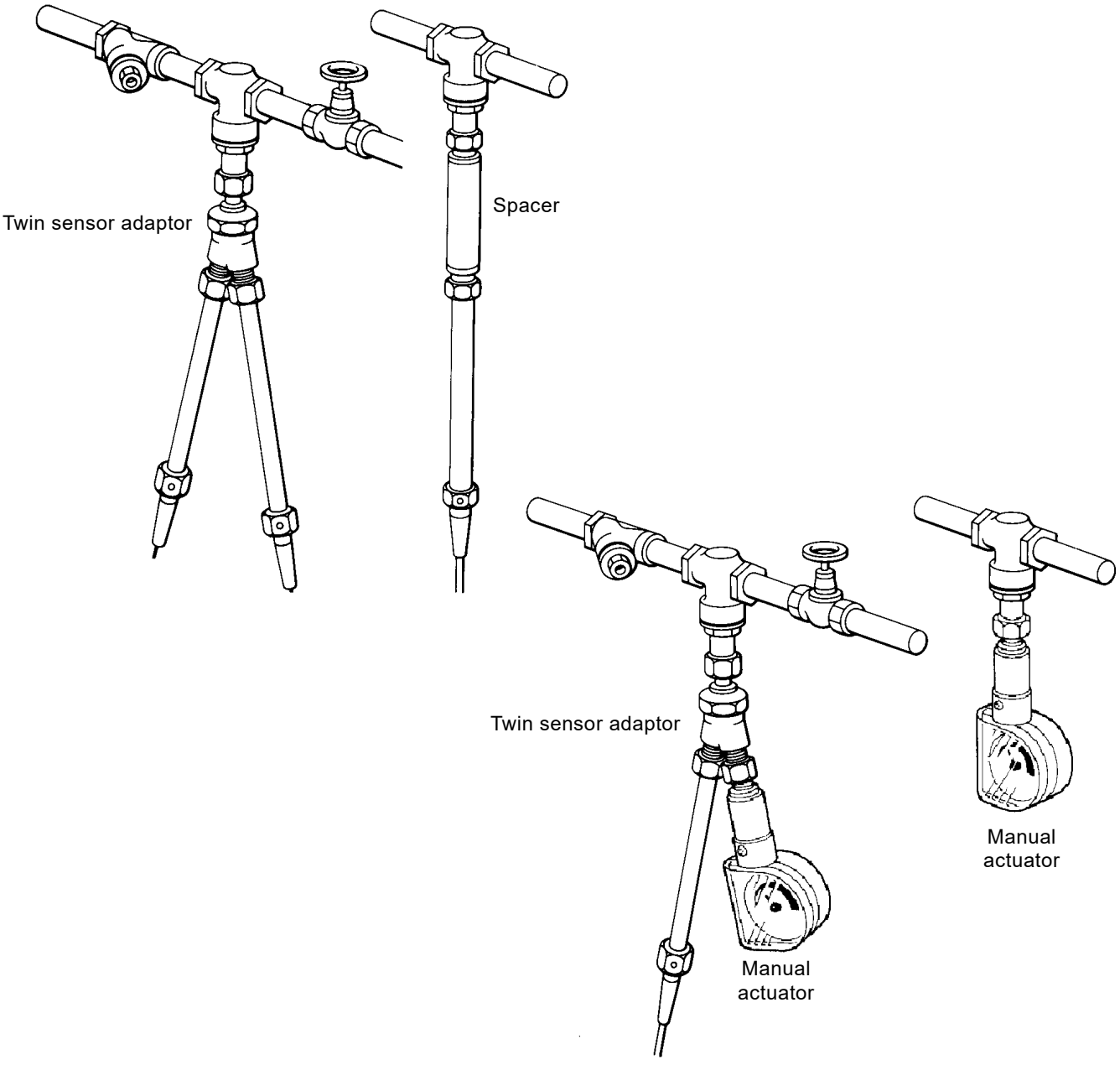
Example: 1 - Spirax Sarco SA121 temperature control system, having temperature range 2, 2 m (6.6 ft) capillary and stainless steel pocket.

TI-P313-02-US
Issue 1

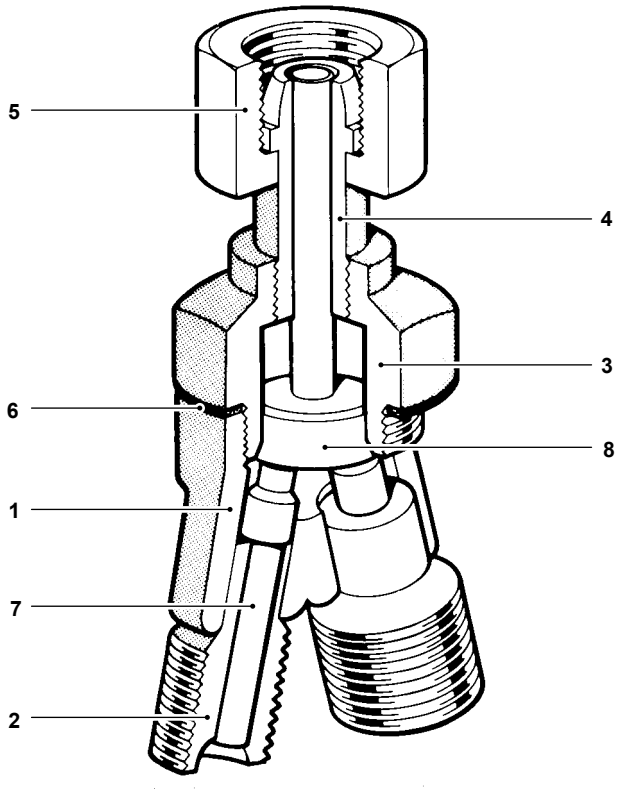
Temperature Control Ancillaries

Twin sensor adaptor

When coupled to a 2 port or 3 port valve allows the valve to be operated by either actuator.

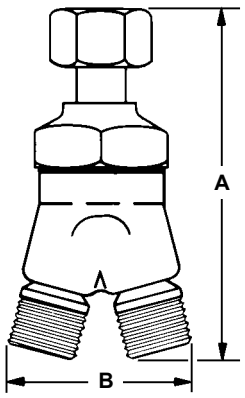


Materials



No.	Part	Material	
1	Body	Brass	BS 2872 CZ 122
2	Connector	Brass	BS 2872 CZ 121
3	Lower body	Brass	BS 2872 CZ 121
4	Nipple	Brass	BS 2872 CZ 121
5	Valve coupling nut	Brass	BS 2872 CZ 121
6	Body gasket	Compressed asbestos fiber	BS 2815 Gr. A
7	Push rod	Brass	BS 2872 CZ 121
8	Plunger	Brass	BS 2872 CZ 121

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



A	B	Weight
4.2 (107)	2.3 (58)	1.6 lb (0.73 kg)

Spacer

When coupled between a 2 port or 3 port valve and the actuator, it enables the system to operate at a higher temperature.
Each Valve has its individual limiting conditions, but when coupled to a Control System, these are governed by the brass actuator which is limited to 450˚F (232˚C). Installing the spacer between the valve and the control system enables the system to operate at a maximum temperature of 662˚F (350˚C).

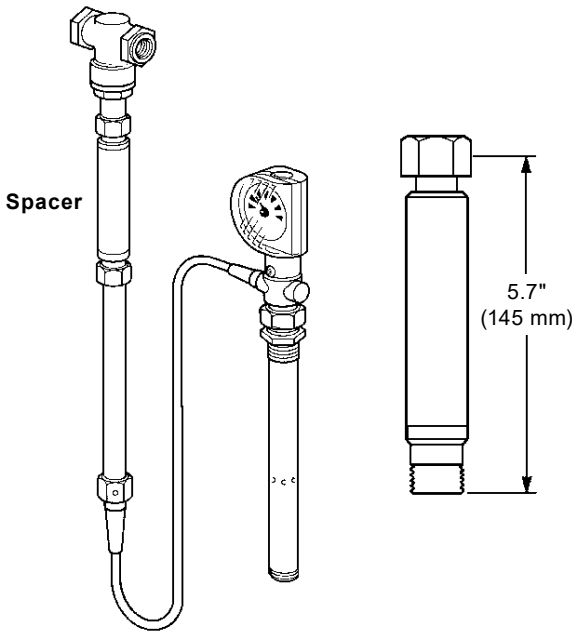
Limiting conditions

Maximum pressure	362 psi	(25 bar)
Maximum temperature	662 ˚F	(350 ˚C)

Materials

	Part	Material	
	Case	Brass	BS 2871 part 2 CZ 162
(1972)	Bellows	Stainless Steel	AISI 321

Dimensions



Manual actuator

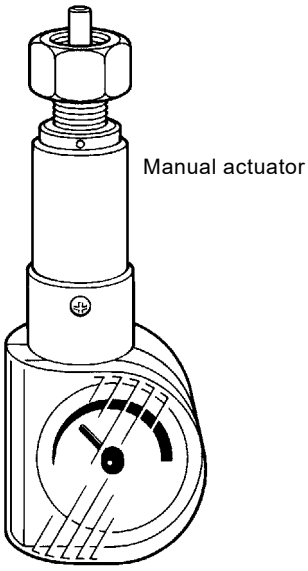
When coupled to a 2 port or a 3 port valve, it enables the valve to be manually operated.

Tamper proof

The Unit is provided with a lockable head to prevent unauthorized tampering with the setting.

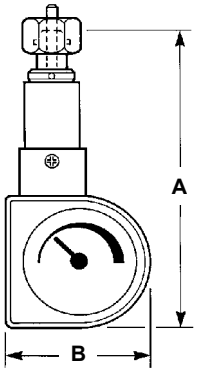
Materials

Brass with plastic adjustment head



Dimensions/weights

(approximate) in inches (mm) and lbs (kg)



A	B	Weight
6.3 (160)	2.2 (55)	0.5 lb (0.2 kg)

TI-S99-11-US
Issue 1

Steam Capacities
2 Port Valves

Steam Capacities - Pounds of saturated steam per hour

Steam Pressure		½" BX & BM				SB			KA			KB				KC		NS	
Inlet	Outlet	2	3	4	6	½	¾	1	½	¾	1	1	1¼	1½	2	1½	2	2½	3
2	0	8	13	21	33	52	78	137	58	94	198	198	333	479	687	333	687	1,310	1,890
3	0	9	16	26	41	64	96	168	71	115	242	242	408	587	842	408	842	1,610	2,320
5	3	8	14	23	37	57	86	150	64	103	217	217	366	525	754	366	754	1440	2080
5	1	11	19	30	49	76	114	200	85	137	289	289	487	700	1000	487	1000	1920	2720
7	5	9	15	24	39	60	90	159	67	108	229	229	386	554	795	386	795	1520	2190
7	2	13	22	35	56	88	132	231	98	158	333	333	561	807	1160	561	1160	2210	3190
10	7	11	19	31	50	77	116	204	87	139	294	294	496	713	1020	496	1020	1950	2820
10	5	14	24	38	61	95	143	250	107	171	362	362	610	876	1260	610	1260	2400	3470
12	9	12	20	32	52	81	121	213	91	146	308	308	518	745	1070	518	1070	2040	2950
12	7	15	25	40	64	100	150	263	112	180	380	380	640	920	1320	640	1320	2520	3640
12	0	19	31	51	82	128	191	336	143	230	485	485	816	1170	1680	816	1680	3210	4640
15	12	13	21	34	55	86	129	226	96	155	326	326	550	790	1130	550	1130	2170	3130
15	9	17	28	46	73	114	172	301	128	206	435	435	733	1050	1510	733	1510	2880	4170
15	0/3	21	35	57	91	142	214	375	160	257	542	542	912	1310	1880	912	1880	3590	5190
20	17	14	23	37	60	94	140	247	105	169	356	356	599	861	1240	599	1240	2360	3410
20	13	20	33	53	86	134	201	352	150	241	508	508	856	1230	1760	856	1760	3370	4870
20	0/5	24	41	67	107	167	250	439	187	300	633	633	1070	1530	2200	1070	2200	4200	6060
30	26	18	30	49	78	122	184	323	137	220	465	465	784	1130	1620	784	1620	3090	4460
30	22	24	41	66	105	164	247	433	184	296	625	625	1050	1510	2170	1050	2170	4150	5990
30	0/12	31	53	86	137	215	322	565	240	386	815	815	1370	1970	2830	1370	2830	5410	7810
40	34	24	40	66	105	164	246	432	184	295	624	624	1050	1510	2170	1050	2170	4140	5970
40	30	30	50	81	130	203	304	534	227	365	771	771	1300	1870	2680	1300	2680	5110	7390
40	0/17	39	65	105	168	263	394	691	294	473	998	998	1680	2420	3470	1680	3470	6620	9560
50	43	28	48	77	123	193	289	508	216	347	733	733	1230	1770	2550	1230	2550	4860	7020
50	37	37	61	100	159	249	373	655	279	448	946	946	1590	2290	3290	1590	3290	6270	9060
50	0/22	46	77	124	199	311	466	818	348	559	1180	1180	1990	2860	4100	1990	4100	7830	11300
60	52	33	55	89	142	222	333	584	248	399	843	843	1420	2040	2930	1420	2930	5590	8070
60	46	41	69	112	179	280	420	737	313	504	1060	1060	1790	2570	3690	1790	3690	7050	10190
60	0/30	53	88	143	229	359	538	944	402	645	1360	1360	2290	3300	4730	2290	4730	9040	13050

Table continued on next page

Steam Capacities - Pounds of saturated steam per hour (continued)

Steam Pressure		½" BX & BM				SB			KA			KB				KC		NS	
Inlet	Outlet	2	3	4	6	½	¾	1	½	¾	1	1	1¼	1½	2	1½	2	2½	3
75	65	40	67	108	173	271	407	714	304	488		1030	1735	2490	3575	1735	3575	6830	9870
75	57	51	85	138	221	345	517	908	386	620		1310	2210	3170	4550	2210	4650	8690	12550
75	0/37	63	106	172	275	430	645	1130	482	775		1640	2760	3960	5680	2760	5680	10850	15670
100	90	46	77	124	199	310	465	820	348	560		1180	1990	2860	4100	1990	4100	7830	11310
100	78	64	107	173	277	435	650	1140	485	780		1650	2770	3990	5720	2770	5720	10930	15780
100	0/52	81	136	220	352	550	825	1450	615	990		2090	3520	5070	7270	3520	7270	13870	20040
125	112	57	96	156	250	390	585		435	700		1480	2490			2490	5140	9820	14180
125	98	78	131	212	339	530	795		590	950		2010	3390			3390	6990	13340	19280
125	0/66	98	165	268	430	670	1010		750	1210		2550	4290			4290	8850	16900	24410
150	133	71	119	192	308	480	720		540							3080	6350	12120	17510
150	117	93	156	253	405	630	950		710							4050	8350	15950	23040
150	0/80	116	195	315	505	790	1185		885							5060	10440	19920	28780
175	157	78	132	213	340	535			600							3420	7040		
175	138	106	178	290	460	720			810							4620	9530		
175	0/95	133	225	365	580	910			1020							5830	12020		
200	180	88	148	240	385	600			670							3830	7910		
200	158	120	202	325	525	820			915							5230	10790		
200	0/109	150	255	410	660	1030			1150							6600	13600		
250	225	110	185	300	475	745			830										
250	196	150	250	410	655	1020			1150										
250	0/138	185	315	510	815	1270			1420										

Unless a control valve is correctly sized, the most sensitive and accurate thermostat cannot give satisfactory control. If the valve is too big, it can cause a "hunting" and rapid wear on the valve head and seat due to wire drawing. Valves too small increase heat-up time and may be incapable of maintaining temperature on heavy load.

The capacity of any valve depends on the difference in pressure between the inlet and outlet (the pressure drop.)

In the case of steam valves, it also depends on the inlet pressure.

Using the Steam Chart

Proper valve selection requires the following information:

1) Required flow in pounds of steam per hour.

2) Inlet steam pressure immediately ahead of the valve.

3) Allowable pressure drop across the valve. On steam applications where it is impossible to calculate the allowable pressure drop, 10% to 20% of the absolute inlet pressure should be used on most applications. Higher pressure drops imply low pressures within the heat exchanger and maximum heater rating may not be achieved.

4) Select valve which meets the above requirements and has suitable end connections and body materials.

Valve capacity factors

Type		Cv
½	**BX2, BM2**	0.44
½	**BX3, BM4**	0.74
½	**BX4, BM4**	1.20
½	**BX6, BM6**	1.92

Type		Cv
½	**SB**	3.0
¾	**SB**	4.5
1	**SB**	7.9

Type		Cv
½	**KA**	3.36
¾	**KA**	5.4
1	**KA, KB**	11.4
1¼	**KB, KC**	19.2
1½	**KB**	27.6
1½	**KC**	19.2
2	**KB, KC**	39.6

Type		Cv
2½	**NS**	75.6
3	**NS**	109.2

1. For Liquids

$$Cv = GPM \sqrt{\frac{\text{Sp. Gr.}}{\text{Pressure Drop, psi}}}$$

Where Sp. Gr. Water = 1

GPM = Gallons per minute

2. For Steam (Saturated)

a. Critical Flow

When ΔP is greater than

$F_L^2 (P_1/2)$

$$Cv = \frac{W}{1.83 F_L P_1}$$

b. Noncritical Flow

When ΔP is less than $F_L^2 (P_1/2)$

$$Cv = \frac{W}{2.1 \sqrt{\Delta P (P_1 + P_2)}}$$

Where:

P_1 = Inlet Pressure psi a

P_2 = Outlet Pressure psi a

W = Capacity lb/hr

F_L = Pressure Recovery Factor

(.9 on globe pattern valves for flow to open)

(.85 on globe pattern valves for flow to close)

3. For Air and Other Gases

a. When P_2 is 0.53 P_1 or less,

$$Cv = \frac{SCFH \sqrt{\text{Sp. Gr.}}}{30.5 P_1}$$

Where Sp. Gr. of air is 1.

SCFH is Cu. ft. Free Air per Hour at 14.7 psia, and 60 °F.

b. When P_2 is greater than 0.53 P_1,

$$Cv = \frac{Cv = SCFH \sqrt{\text{Sp. Gr.}}}{61 \sqrt{(P_1 - P_2) P_2}}$$

Where Sp. Gr. of air is 1.

SCFH is Cu. Ft. Free Air per Hour at 14.7 psia, and 60 °F.

4. Correction for Superheated Steam

The required Valve C_v is the C_v from the formula multiplied by the correction factor.

Correction Factor =

1 + (.00065 x degrees F. superheat above saturation)

Example: With 25 °F of Superheat, Correction Factor

= 1 + (.00065 x 25)

= 1.01625

5. Correction for Moisture Content

Correction Factor = $\sqrt{\text{Dryness Fraction}}$

Example: With 4% moisture,

Correction Factor = $\sqrt{1 - 0.04}$

= 0.98

6. Gas—Correction for Temperature

Correction Factor = $\sqrt{\frac{460 + °F}{520}}$

Example: If gas temperature is 150 °F, Correction Factor = $\sqrt{\frac{460 + 150}{520}}$

= 1.083

Spira-trol Valve Capacities for Proportional Band Range of 2 ˚F to 14 ˚F

Cv Table based on sensor 121

Valve Type	Size	Proportional Band								Max Cv @	Maximum Proportional Band
		2 ˚F (± 1 ˚)	3 ˚F (± 1½ ˚)	4 ˚F (± 2 ˚)	6 ˚F (± 3 ˚)	8 ˚F (± 4 ˚)	10 ˚F (± 5 ˚)	12 ˚F (± 6 ˚)	14 ˚F (± 7 ˚)		
BX BM	½" BX2/BM2	.23	.32	.39	.44						
	½" BX3/BM3	.24	.36	.48	.68	.74				0.74	7.9 ˚F
	½" BX4/BM4	.43	.61	.75	.98	1.2				1.2	7.9 ˚F
	½" BX6/BM6	.56	.80	1.1	1.5	1.9				1.9	7.9 ˚F
BXRA/BMRA	½"	.18	.26	.35	.52	.66				0.66	7.9 ˚F
SB SBRA	½"	1.1	1.6	2.1	2.7	3.0				3.0	7.9 ˚F
	¾"	1.8	2.5	3.2	4.0	4.5				4.5	7.9 ˚F
	1"	2.6	3.6	4.6	6.3	7.5	7.9			7.9	10 ˚F
K Series KC 1-½" has same rating as KC 1¼"	½"	1.5	2.1	2.6	3.2	3.4				3.4	7.9 ˚F
	¾"	1.6	2.2	2.7	3.7	4.6	5.4			5.4	10 ˚F
	1"	3.1	4.6	6.0	8.4	10.0	10.6	11.0	11.4	11.4	14 ˚F
	1¼"	3.5	5.3	7.0	10.0	12.3	14.3	16.0	17.0	19.2	20 ˚F
	1½"	3.7	5.5	7.3	10.6	13.6	16.3	19.0	22.0	27.6	22.5 ˚F
	2"	3.8	5.8	7.6	11.5	15.0	19.0	23.0	27.0	39.6	23.8 ˚F
NS	2½"	8.8	13.0	17.4	26.0	35.0	43.0	51.0	60.0	75.6	23.8 ˚F
NSRA	3"	17.0	25.0	33.0	48.0	65.0	80.0	92.0	98.0	109	23.8 ˚F
TW* * size 3-port valves on Max. Cv	¾"					5.4					
	1"						10.1				
	1½"								27		

For Sensor Types 122 and 128, double proportional bands given above.

Conversion equation

For kg/h, multiply by .454
For psi to bar, divide by 14.29

TI-P281-01-US
Issue 1

Water Capacities
2 and 3 Port Valves

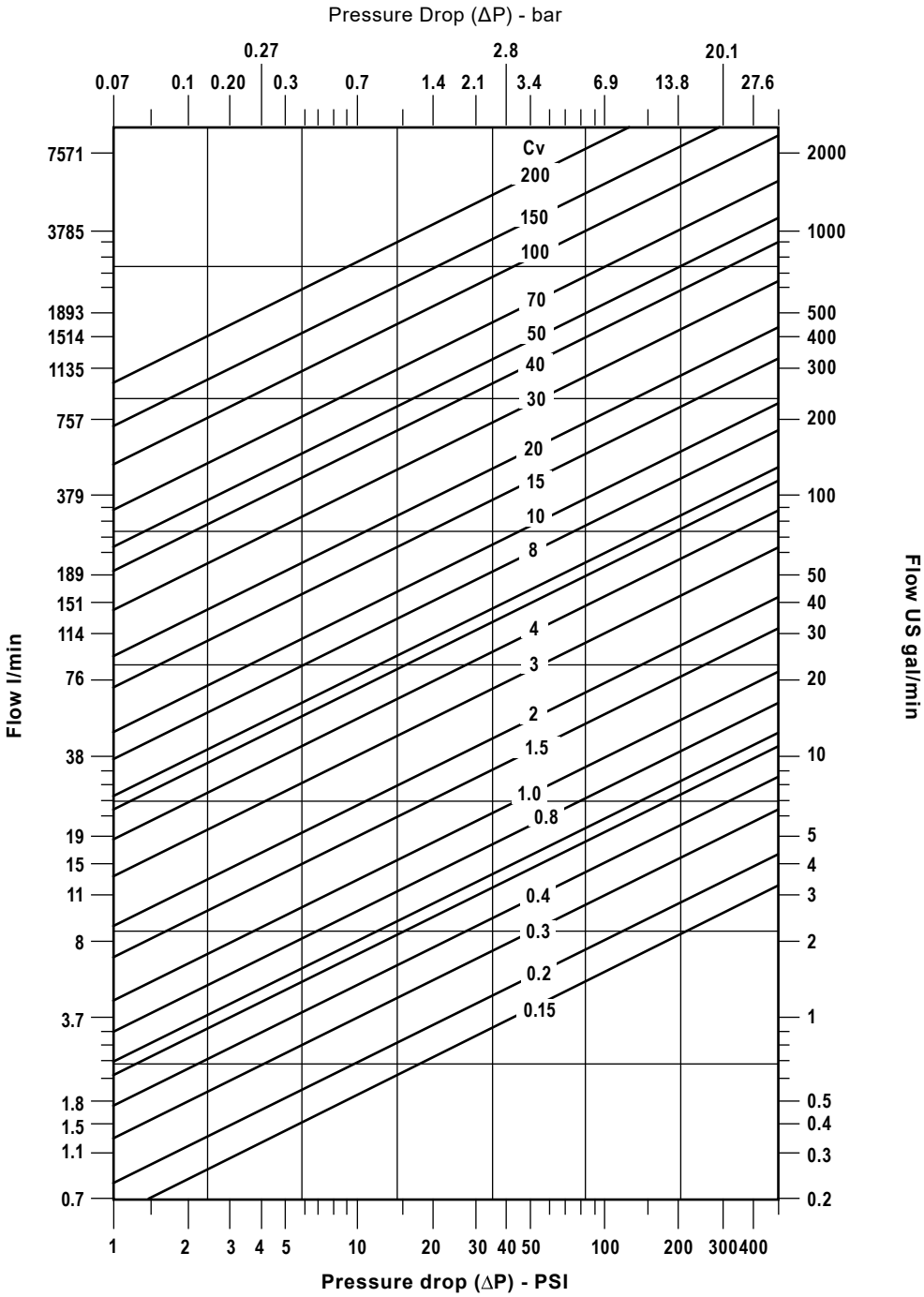
Using the water chart

From the chart, select a valve that passes the required flow at the maximum allowable differential pressure. Follow the vertical pressure line and choose a suitable normally open or normally closed valve with the required capacity.

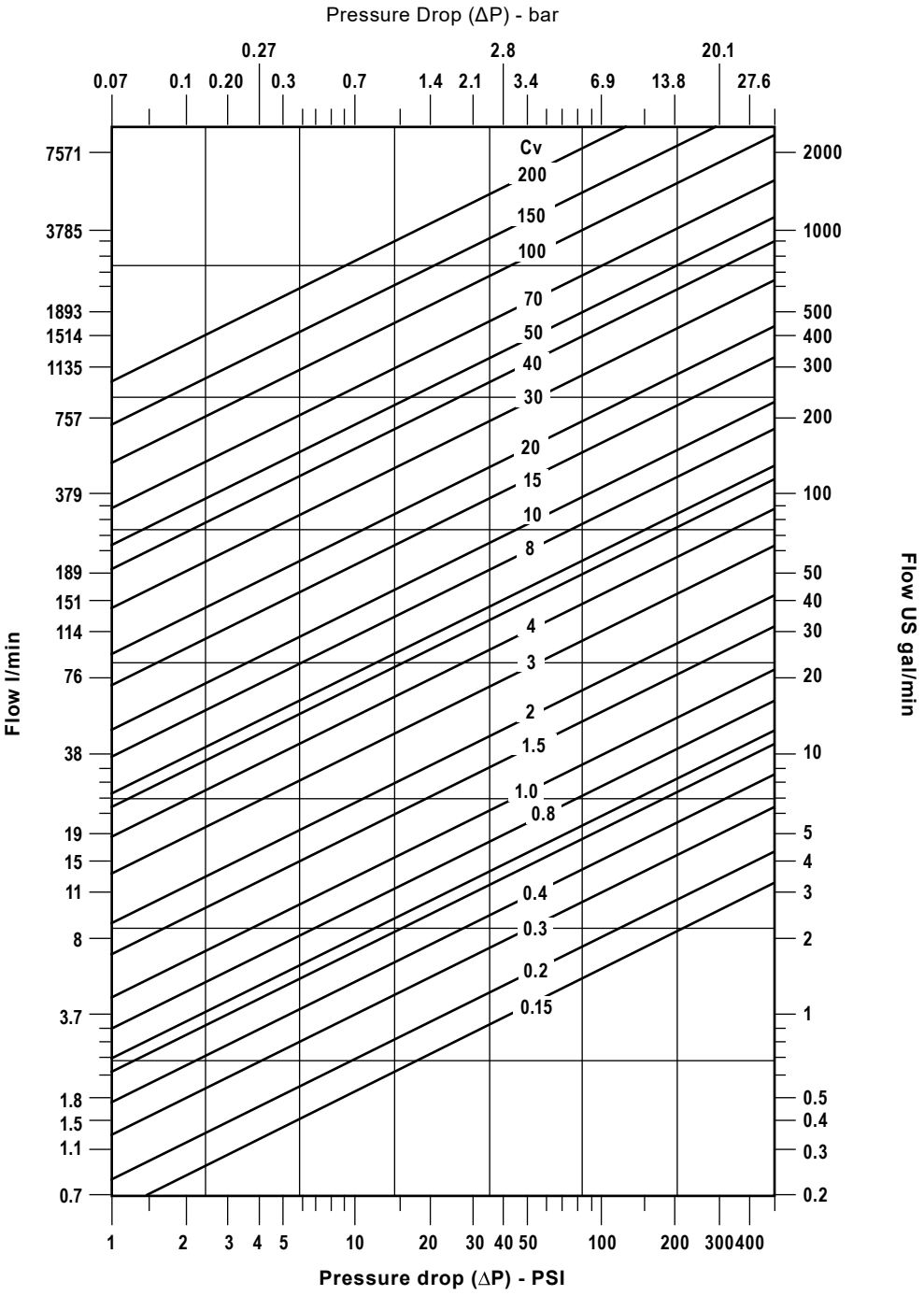
Valve capacity factors

2 Port Normally Open Valves (for heating)		Cv
½	BX2, BM2	0.44
½	BX3, BM3	0.74
½	BX4, BM4	1.20
½	BX6, BM6	1.92
½	SB	3.0
¾	SB	4.5
1	SB	7.9
½	KA	3.36
¾	KA	5.4
1	KA, KB	11.4
1¼	KB, KC	19.2
1½	KC	19.2
1½	KB	27.6
2	KB, KC	39.6
2½	NS	75.6
3	NS	109.2

Valve capacity factors continued on next page



2 Port Normally Closed Valves (for cooling)		Cv
½	BXRA, BMRA	0.66
½	SBRA	3.0
¾	SBRA	4.5
1	SBRA	7.9
1	KX	11.4
1¼	KY	19.2
1½	KY	27.6
2	KY	39.6
2½	NSRA	75.6
3	NSRA	109.2
3 Port Valves		**Cv**
¾	TW	5.4
1	TW	10.5
1½	TW	24



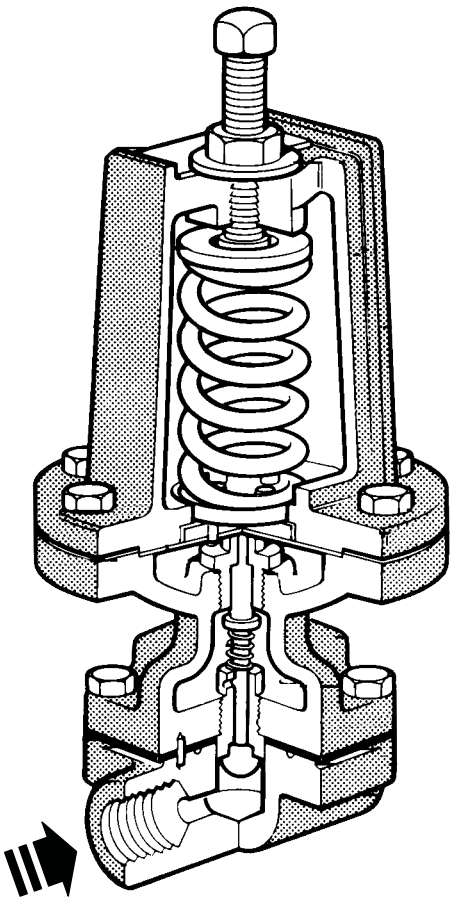
TI-P235-21-US
Issue 1

Direct Operated Pressure Regulator 25MP

Description

The 25MP is a direct acting steam pressure reducing valve. Downstream pressure is fed back through an external sensing line.

Model	25MP
Sizes	½" (DN15)
Connections	NPT
Construction	Cast Iron



Typical applications

Small steam pressure reducing applications where an 80% to 90% accuracy of regulation is acceptable.

Limiting operating conditions

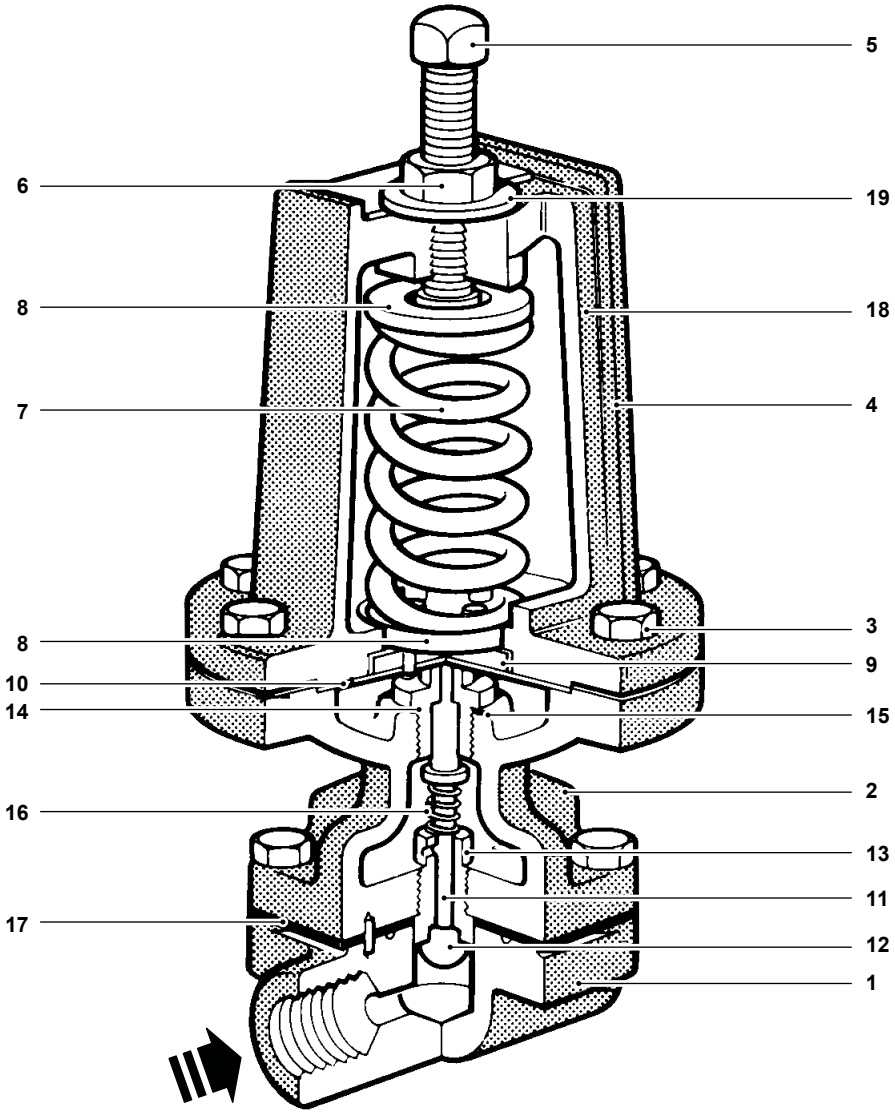
Maximum operating pressure (PMO)	250 psi g (17 bar g)
Maximum operating temperature	450 ˚F (232 ˚C)

Downstream pressure ranges

For the following downstream pressures, three color-coded pilot valve springs are available:

Yellow:	**Blue:**	**Red:**
3 to 30 psi (0.2 to 2.1 bar)	20 to 100 psi (1.4 to 6.9 bar)	80 to 250 psi (5.5 to 17.2 bar)

Materials

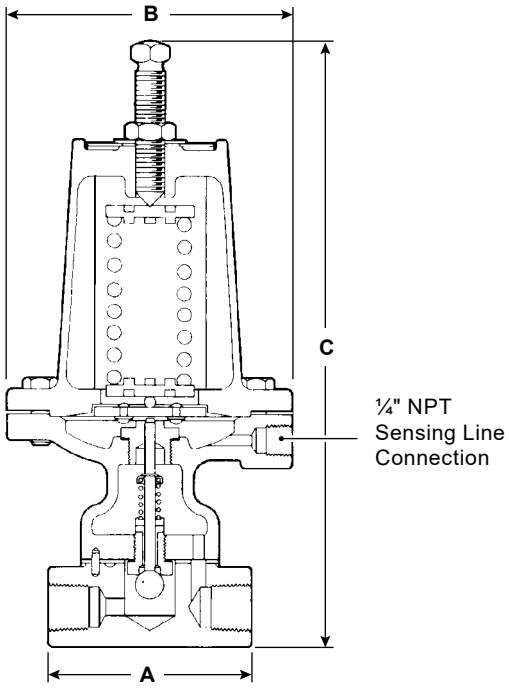


No.	Part	Material	
1	Body	Cast iron	ASTM A 126 CL B
2	Lower diaphragm housing	Cast iron	ASTM A 126 CL B
3	Diaphragm bolts	Steel	ASTM A449
4	Upper case diaphragm	Cast iron	ASTM A 126 CL B
5	Adjustment screw	Stainless steel	AISI 300 series
6	Jam nut	Brass	ASTM B16
7	Adjustment spring	Carbon steel	AISI 1060
8	Spring plate	Steel	ASTM A 569
9	Diaphragm plate	Brass	ASTM 36(260)

No.	Part	Material	
10	Diaphragm	Phosphor bronze	ASTM B 103 Alloy A
11	Stem	Stainless steel	AISI 303
12	Valve head	Stainless steel	AISI 440A
13	Valve seat	Stainless steel	400 Series STN Steel
14	Stem guide	Stainless steel	AISI 303
15	Stem guide gasket	Stainless steel	AISI 302
16	Pilot valve spring	Stainless steel	AISI 302
17	Pilot valve assembly gasket	Graphite	AISI 302
18	Cover plate	Stainless steel	AISI 300 Series
19	Retaining ring	Brass	ASTM B 36

Dimensions/weights (approximate) in inches (mm) and lbs (kg)

Size	A	B	C	Weight
½" (DN15)	3.5 (89)	4.9 (124)	9.75 (248)	9.75 lb (4.42 kg)



Capacity – Pounds of saturated steam per hour at 80% accuracy of regulation

Inlet Steam Pressure	Reduced Steam Pressure															
	psi g	2	5	10	15	20	30	40	50	60	75	100	125	150	175	200
	bar	.14	.34	.69	1.03	1.38	2.07	2.76	3.45	4.14	5.17	6.89	8.62	10.3	12.1	13.8
15	1.03	8 (3.6)	10 (4.5)	15 (6.8)												
30	2.07	12 (5.4)	18 (8.1)	27 (12.2)	31 (14.1)	33 (15.0)										
50	3.45	15 (6.8)	20 (9.1)	30 (13.6)	37 (16.8)	46 (20.9)	50 (22.7)	57 (25.9)								
75	5.17	17 (7.7)	23 (10.4)	48 (21.8)	59 (26.8)	73 (33.1)	74 (33.6)	78 (35.4)	73 (33.1)	72 (32.9)						
100	6.89	19 (8.6)	39 (17.7)	56 (25.4)	70 (31.8)	85 (38.6)	93 (42.2)	110 (49.9)	92 (41.8)	98 (44.5)	94 (42.7)					
125	8.62			68 (30.9)	85 (38.6)	102 (46.3)	118 (53.6)	122 (55.4)	116 (52.7)	125 (56.8)	128 (58.1)	119 (54.0)				
150	10.3			85 (38.6)	105 (47.7)	124 (56.3)	139 (63.1)	139 (63.1)	139 (63.1)	142 (64.5)	145 (65.8)	143 (64.9)	139 (63.1)			
175	12.1			97 (44.0)	123 (55.9)	140 (63.6)	159 (72.1)	163 (74.0)	150 (68.1)	159 (72.1)	162 (73.5)	164 (74.4)	162 (73.5)	157 (71.2)		
200	13.8			114 (51.8)	137 (62.2)	160 (72.6)	182 (82.6)	188 (85.4)	173 (78.5)	187 (84.9)	191 (86.7)	194 (88.1)	197 (89.4)	190 (86.3)	167 (75.8)	
250	17.2			137 (62.2)	164 (74.5)	192 (87.2)	218 (99.0)	226 (102.6)	224 (101.7)	228 (103.5)	230 (104.4)	233 (105.8)	232 (105.3)	234 (106.2)	222 (100.8)	210 (95.3)
300	20.6				185 (84.0)	210 (95.3)	245 (111.2)	270 (122.6)	260 (118.0)	265 (120.3)	272 (123.5)	275 (124.9)	216 (98.1)	280 (127.1)	280 (127.1)	275 (124.9)

Capacity and accuracy of regulation

Capacity of the type MP regulator is based upon the accuracy of regulation of the reduced pressure, and chart values are given for an accuracy of regulation of 80%. This means that, for example, at a reduction of 100 psi to 20 psi (6.89 bar to 1.38 bar), the capacity will be 85 lbs/hr (39 kg) when the reduced pressure drops to 80% of the 20 psi (1.38 bar) initial setting or 16 psi (1.10 bar).

The following multipliers can be used to determine the capacity for other percent of accuracy of regulation values.

Accuracy of Regulation	Capacity Chart Multiplier
75%	1.25
80%	1.0
85%	0.75
90%	0.5

Sample specification

The pressure regulator shall be direct-acting with an external pressure sensing line. The valve trim shall be hardened stainless steel, and the body shall be cast iron.

Installation

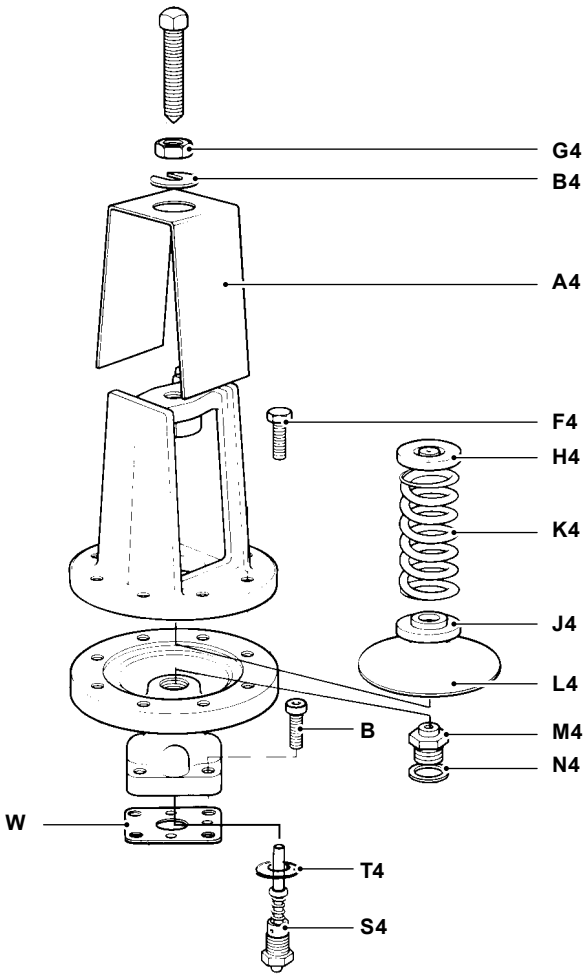
The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The pressure sensing line should be located in a straight section of the downstream piping at least 10 pipe diameters from the nearest fitting, or in the steam space.

Maintenance

Complete installation and maintenance instructions are given in IM-3-104-US, a copy of which is supplied with each valve.

Spare parts

Cover Plate w/ Retaining Ring	**A4, B4**
Pilot Screws w/ Gasket	**B, W**
Adjustment Screw w/ Nut, and Upper and Lower Spring Support Disc	**G4, H4,J4**
Adjustment Spring Specify controlled pressure and spring color Yellow 3 to 30 psi Blue 20 to 100 psi Red 80 to 250 psi	**K4**
Diaphragm Assembly	**L4**
Stem Guide w/ Gasket	**M4, N4**
Head and Seat Assembly w/ Gasket	**S4, T4**
Square Gasket for all Pilots (set of 3)	**W**



TI-P001-07
CTLS Issue 6

LRV2B and LRV2S Gunmetal Pressure Reducing Valves

Description

The LRV2B and LRV2S are direct acting pressure reducing valves suitable for liquid applications.

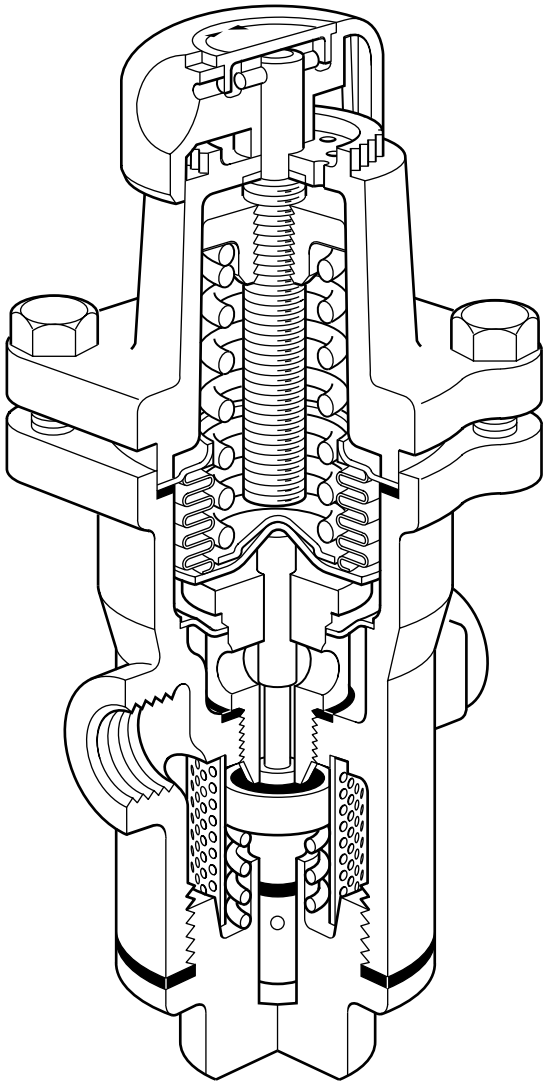
Available types

LRV2B	Phosphor bronze/brass bellows
LRV2S	Stainless steel (316 Ti/316L) bellows

LRV2B and LRV2S pressure reducing valves are supplied with one of three colour coded springs which are identified by the disc (19) located on the adjustment handwheel:

Grey	For downstream pressure control:	0.35 to 1.7 bar g (5.08 to 24.7 psi g)
Green	For downstream pressure control:	1.40 to 4.0 bar g (20.3 to 58.0 psi g)
Orange	For downstream pressure control:	3.50 to 8.6 bar g (50.8 to 125 psi g)

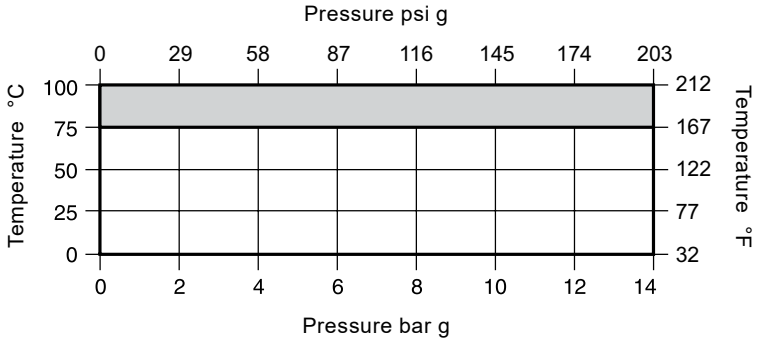
Note: where control spring ranges overlap always use the lower range to give better control.



Sizes and pipe connections

½", ¾" and 1" Screwed BSP (BS 21 Rp) or NPT.

Pressure/temperature limits

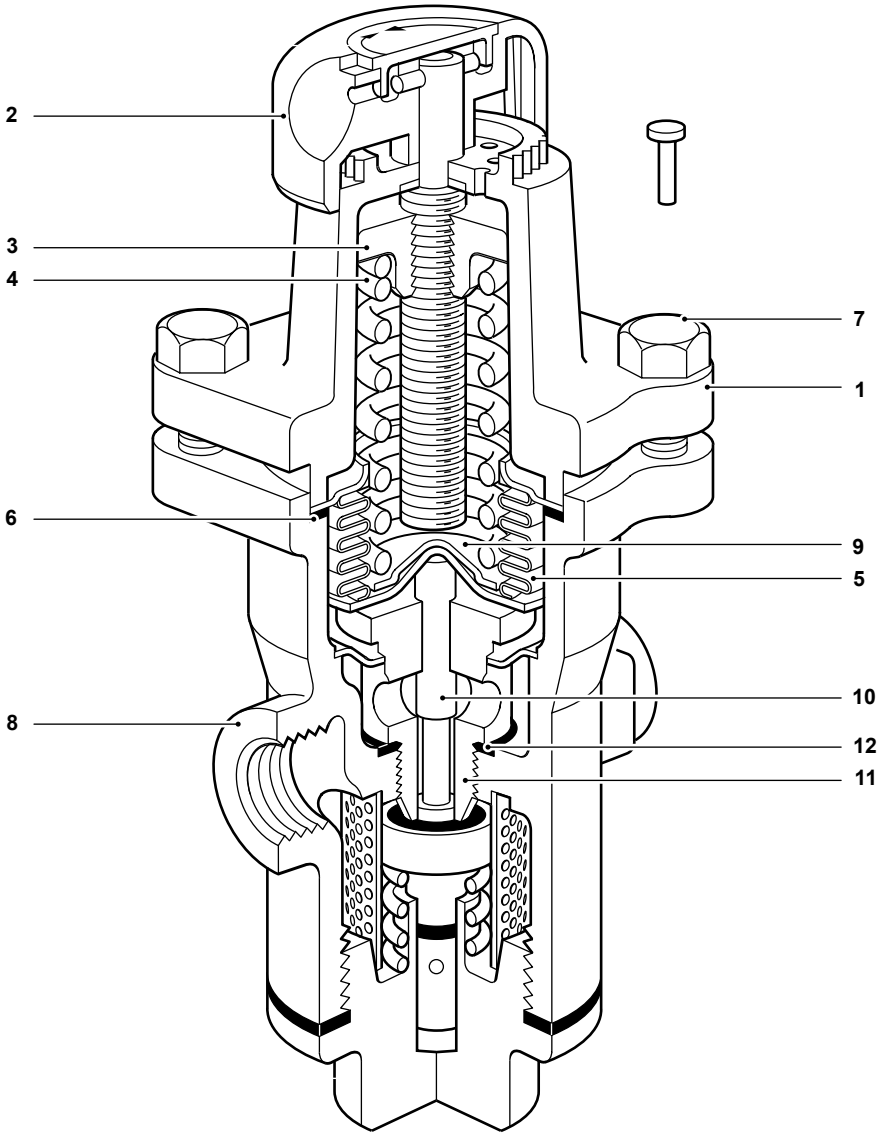


The product **must not** be used in this region.

Body design conditions			PN25
PMA	Maximum allowable pressure	25 bar g @ 120 °C	363 psi g @ 248 °F
TMA	Maximum allowable temperature	100 °C @ 17 bar g	212 °F @ 247 psi g
Minimum allowable temperature		0 °C	32 °F
PMO	Maximum operating pressure	14 bar g @ 75 °C	203 psi g @ 167 °F
TMO	Maximum operating temperature	75 °C @ 14 bar g	167 °F @ 203 psi g
Minimum operating temperature		0 °C	32 °F
Note: For lower operating temperatures consult Spirax Sarco			
ΔPMX	Maximum differential pressure is limited to the PMO		
Maximum recommended turndown ratio 10:1 at maximum flow			
Designed for a maximum cold hydraulic test pressure of		38 bar g	551 psi g

Note: With internals fitted, test pressure must not exceed 17 bar g (247 psi g)

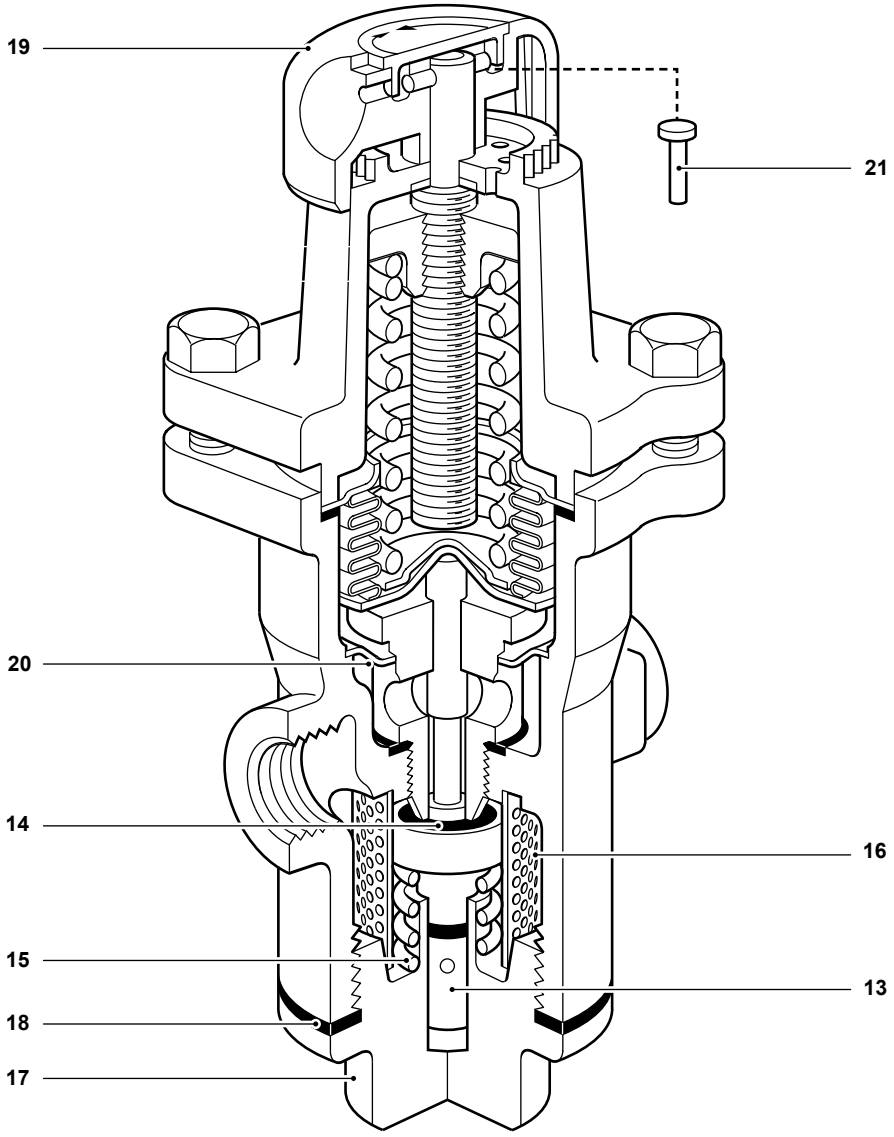
Materials



No.	Part	Materials	
1	Spring housing	Aluminium epoxy coated	LM 24
2	Adjustment handwheel	Polypropylene	
3	Top spring plate	Cast iron	DIN 1691 GG 20
4	Pressure adjustment spring	Silicon chrome spring steel	BS 2803 685 A55 Range 2
5	Bellows assembly	Stainless steel	316Ti/316L
		Phosphor bronze	BS 2872 CZ 122
6	Bellows assembly gasket	Stainless steel reinforced exfoliated graphite	
7	Hex. bolt (M8 x 25 mm)	Steel zinc plated	BS 3692 Gr. 8.8
8	Body	Gunmetal	BS 1400 LG2
9	Cone shaped washer	Stainless steel	ASTM A276 316L
10	Push rod	Stainless steel	ASTM A276 316L
11	Valve seat	Stainless steel	BS 970 431 S29
12	Valve seat gasket	Stainless steel	BS 1449 316 S11

Materials continued on next page

Materials
(continued)



No.	Part	Materials	
13	Piston	Stainless steel	BS 970 431 S29
14	Valve head	Nitrile rubber	
15	Piston return spring	Stainless steel	BS 2056 Gr. 302 S26
16	Strainer screen	Stainless steel	BS 1449 316 S16
17	Cap	Brass	BS 2872 CZ 122
18	Cap gasket	Stainless steel reinforced exfoliated graphite	
19	Spring range ID disc	Polypropylene	
20	Bulkhead plate	Stainless steel	316L
21	Tamper-proof pin	Mild steel copper plated	

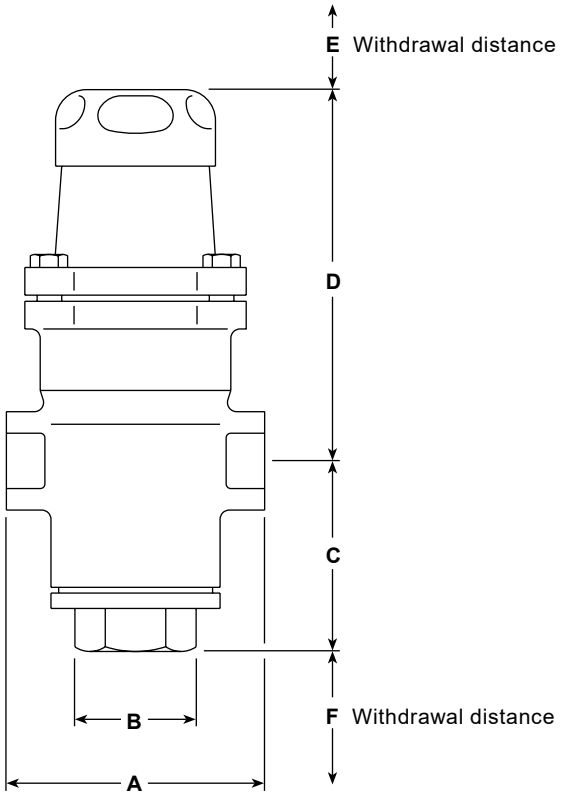
Capacities

Full lift capacity for safety valve sizing purposes are shown opposite:

Size	½"	¾"	1"
Kvs	2.1	3.6	4.3

For conversion:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

Dimensions / weight (approximate) in mm (inches) and kg (lb)



Size	A	B	C	D	E	F	Weight
½"	83 (3.3)	32 (1.3)	62 (2.4)	130 (5.1)	25 (0.98)	40 (1.6)	2.0 (4.4)
¾"	96 (3.8)						2.1 (4.6)
1"	108 (4.3)						2.4 (5.3)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P001-08) supplied with the product.

Installation note:

The valve should be installed in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve body.

How to order

Example: 1 off Spirax Sarco ½" LRV2S pressure reducing valve with gunmetal body, screwed BSP connections, stainless steel bellows and fitted with an orange spring for downstream pressure control of 3.5 to 8.6 bar g (50.8 to 125 psi g).

Please note that the only certification that is available for this product is a manufacturer's Typical Test Report.
Note: All certification / inspection requirements must be stated at the time of order placement.

Spare parts

The spare parts available are shown in heavy outline. Parts drawn in a grey line are not supplied as spares.

Available spares

*	Pressure adjustment spring	Grey	0.35 to 1.7 bar g (5.08 to 24.7 psi g)	**4, 19**
		Green	1.40 to 4.0 bar g (20.3 to 58.0 psi g)	**4, 19**
		Orange	3.50 to 8.6 bar g (50.8 to 125 psi g)	**4, 19**
*	Bellows assembly specify type	Stainless steel or phosphor bronze		**5, 6, 9**
*	Spring housing hex. bolts (set of 4)			**7**
	Valve and seat assembly			**6, 11, 12, 13, 14, 15, 16, 20**
*	Gasket set			**6, 12, 18**
*	Strainer screen			**16**

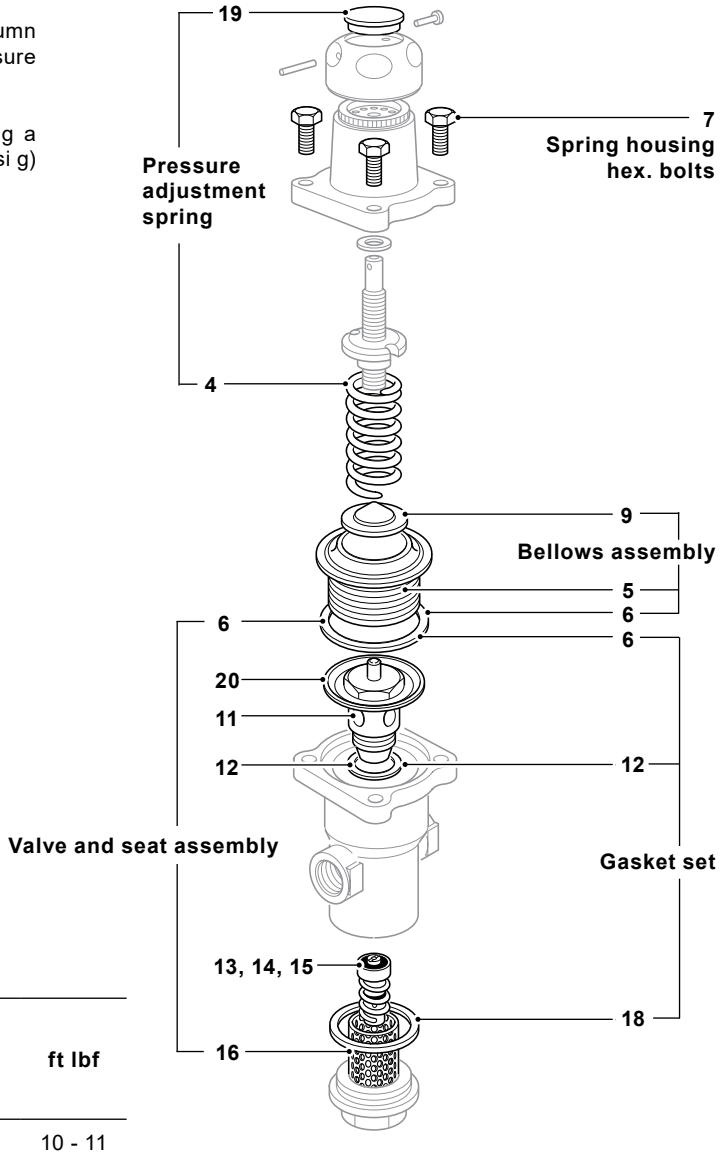
* Common to all sizes.

3.2
10

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, type and pressure range of the reducing valve.

Example: 1 off Pressure adjustment spring (orange), having a downstream pressure range of 3.5 to 8.6 bar g (50.8 to 125 psi g) for a Spirax Sarco ½" LRV2S pressure reducing valve.



Recommended tightening torques

Item	Part	or mm		N m	ft lbf
7	Hex. bolts	13 A/F	M8 x 25	13 - 15	10 - 11
11	Valve seat	32 A/F		108 - 132	80 - 97
16	Bottom cap	32 A/F		65 - 75	48 - 55

TI-P045-14
CTLS Issue 8

BRV2S and BRV2B
SG Iron
Pressure Reducing Valves

Description

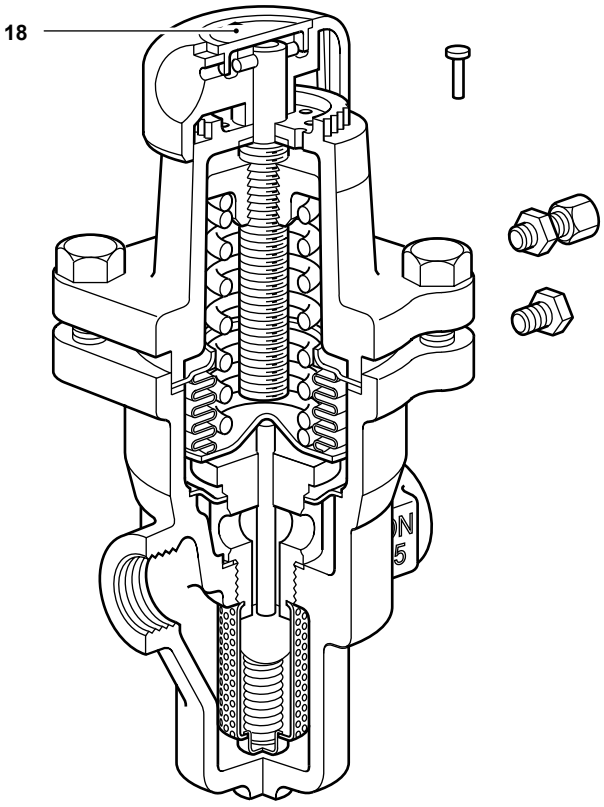
The BRV2S and BRV2B are direct acting pressure reducing valves designed for applications using steam or gases such as compressed air. This range of pressure reducing valves have SG iron bodies and are available with screwed or flanged connections.

Available types

BRV2S	Stainless steel bellows	
BRV2B	Phosphor bronze bellows	
BRV2SP	Stainless steel bellows	With external pressure sensing connection
BRV2BP	Phosphor bronze bellows	

BRV2 pressure reducing valves are supplied with one of three colour coded springs which are identified by the disc (**18**) located on the adjustment handwheel.
Note: Where control spring ranges overlap always use the lower range to give better control:

Grey	For downstream pressure control:	0.14 to 1.7 bar g (2 to 25 psi g)
Green	For downstream pressure control:	1.40 to 4.0 bar g (20 to 58 psi g)
Orange	For downstream pressure control:	3.50 to 8.6 bar g (51 to 125 psi g)



Standards

This product fully complies with the requirements of the Pressure Equipment Directive (PED).

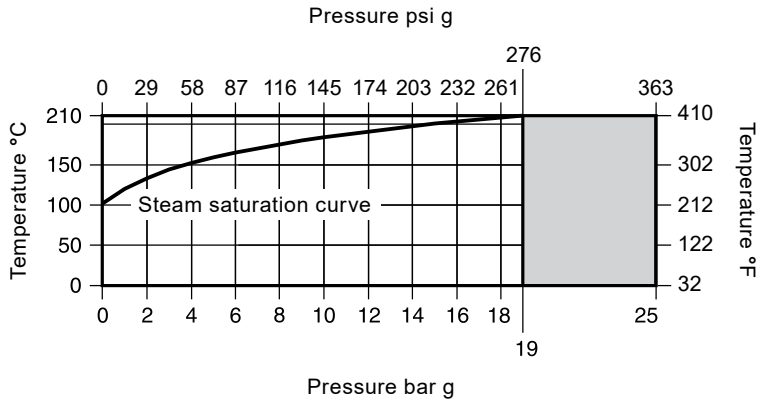
Certification

This product is available with a manufacturers' Typical Test Report.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

½", ¾" and 1" screwed BSP (BS 21 Rp) or NPT.
DN15, DN20 and DN25 flanged EN 1092 PN25.

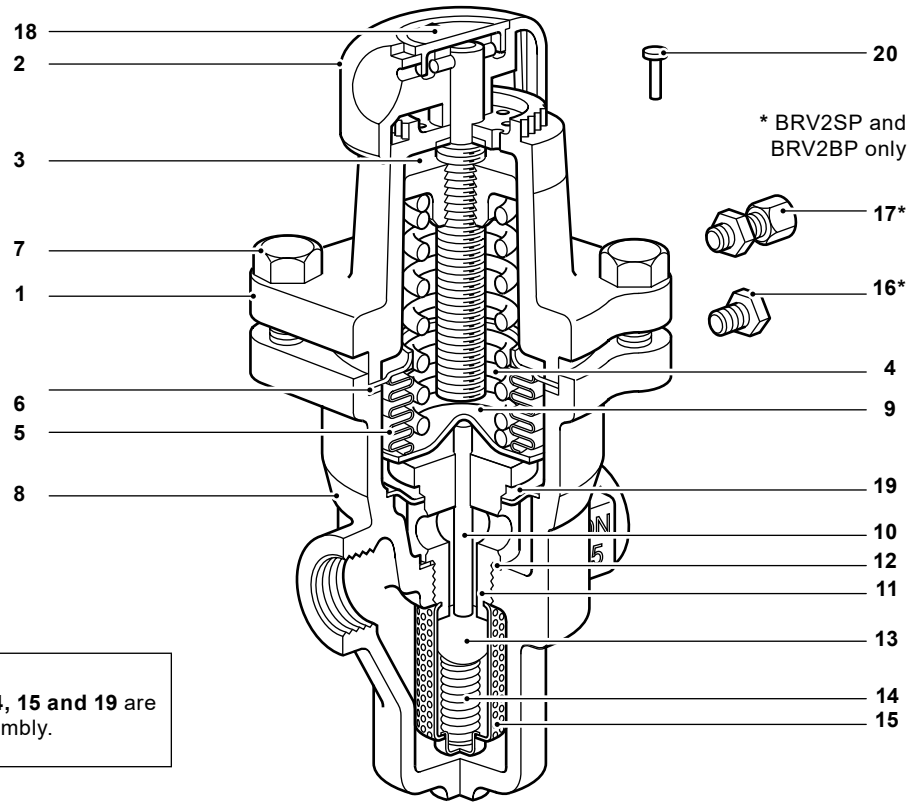
Pressure/temperature limits



The product **must not** be used in this region.

Body design conditions		PN25
Maximum design pressure	25 bar g @ 120 °C	(363 psi g @ 248 °F)
Maximum design temperature	210 °C @ 19 bar g	(410 °F @ 276 psi g)
Minimum allowable temperature	-10 °C	(14 °F)
Maximum operating pressure for saturated steam service	17 bar g @ 207 °C	(247 psi g @ 405 °F)
Maximum operating temperature	207 °C @ 17 bar g	(405 °F @ 247 psi g)
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco	0 °C	(32 °F)
Maximum downstream reduced pressure	8.6 bar g	(125 psi g)
Maximum differential pressure	17 bar	(247 psi)
Maximum recommended turndown ratio		10:1 at maximum flow
Designed for a maximum cold hydraulic test pressure of:	38 bar g	(551 psi g)
Note: With internals fitted, test pressure must not exceed:	19 bar g	(276 psi g)

Materials



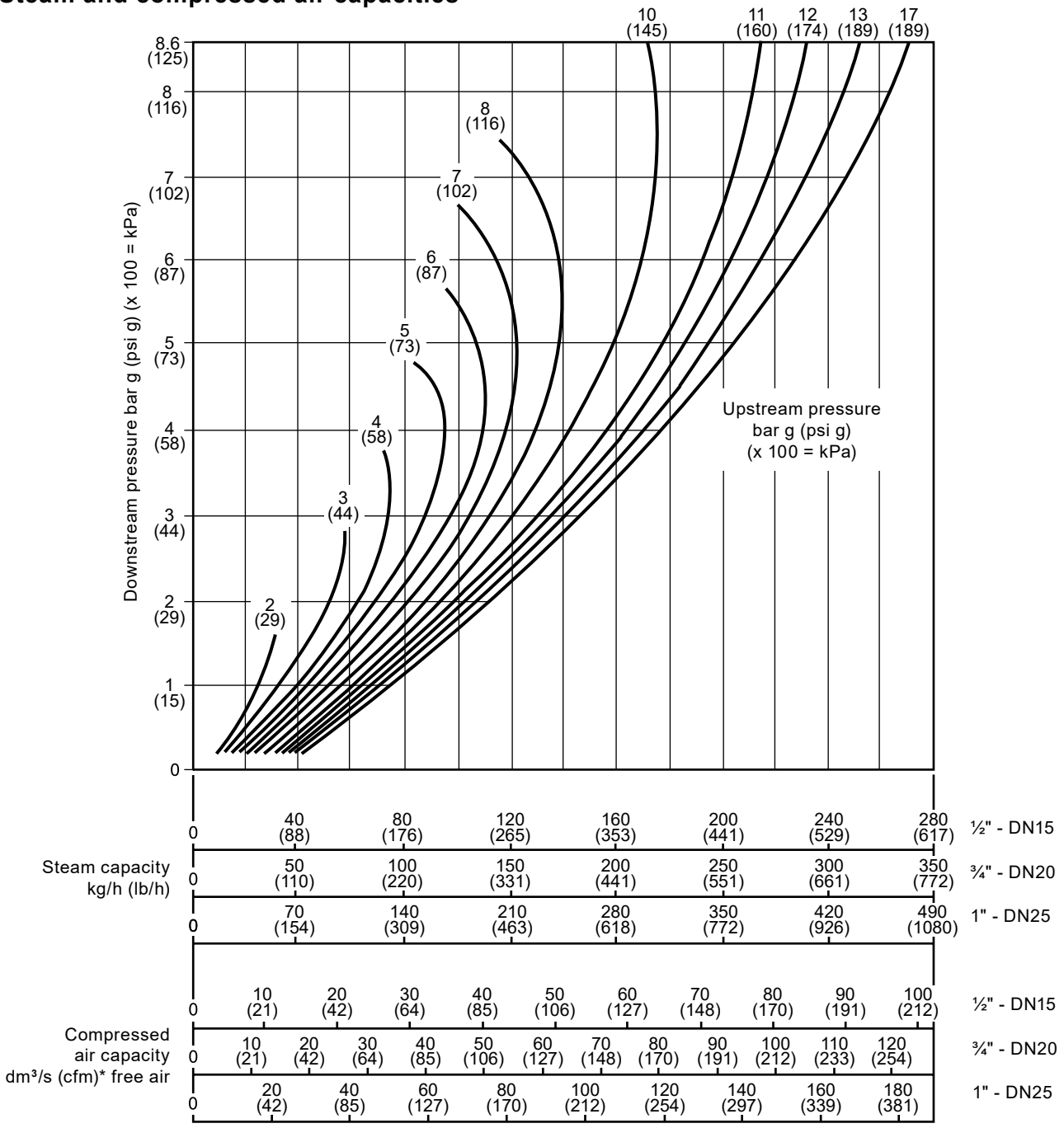
Note:
Items **10, 11, 13, 14, 15 and 19** are all part of one assembly.

No.	Part	Materials	
1	Spring housing	Aluminium epoxy coated	LM 24
2	Adjustment handwheel	Polypropylene	
3	Top spring plate	Cast iron	DIN 1691 GG 20
4	Pressure adjustment spring	Silicon chrome spring steel	BS 2803 685 A55 Range 2
5	Bellows assembly	Stainless steel	316Ti/316L
		Phosphor bronze/brass	BS 2872 Cz 122
6	Bellows assembly gasket	Stainless steel reinforced exfoliated graphite	
7	Hex. bolt (M8 x 25 mm)	Steel zinc plated	BS 3692 Gr. 8.8
8	Body	SG iron	DIN 1693 GGG 40.3
10	Pushrod	Stainless steel	ASTM A276 316L
11	Valve seat	Stainless steel	BS 970 431 S29
12	Valve seat gasket	Stainless steel	BS 1449 316 S11
13	Valve	Stainless steel	AISI 420
14	Valve return spring	Stainless steel	BS 20056 316 S42
15	Strainer screen	Stainless steel	BS 1449 316 SH
16	Blanking plug	Stainless steel	BS 970 431 S29
17	Compression fitting	Brass	
18	Spring range ID disc	Polypropylene	
19	Bulkhead plate	Stainless steel	316L
20	Tamper-proof pin	Mild steel copper plated	

Capacities for safety valve sizing

Full lift capacities for safety valve sizing purposes:	Size	DN15 (½")	DN20 (¾")	DN25 (1")	For conversions:
	Kvs	1.5	2.5	3.0	Cv (UK) = Kv x 0.963 Cv (US) = Kv x 1.156

Steam and compressed air capacities



* dm³/s = l/s, 1 l/s ≙ 2 c.f.m.

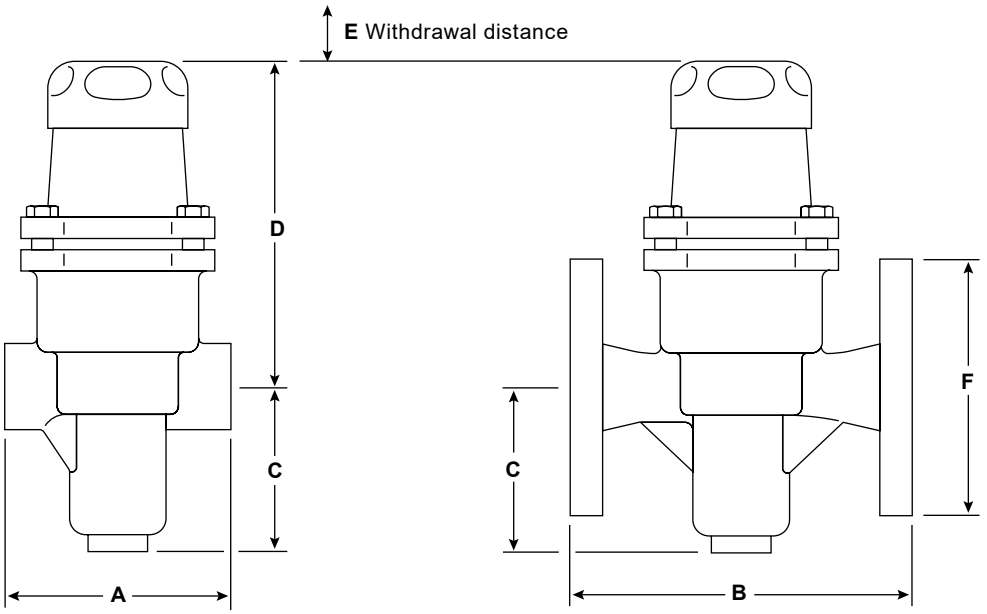
How to use the chart

The curved lines labelled 2, 3, 4, 5 etc., represent upstream pressures. Downstream pressures are read along the vertical line on the left hand side of the chart.

How to use the chart is best described by an example:-

Required, a pressure reducing valve to pass 120 kg/h reducing from 8 to 6 bar. From the downstream pressure of 6 bar on the left hand side of the chart extend out horizontally until the line meets the curved 8 bar upstream line. At this point read vertically downwards where it will be seen that a ½" BRV2 will be required.

Dimensions/weights (approximate) in mm (in) and kg (lb)



Size	A	B	C	D	E	F	Weight	
							Scr	Flg
DN15 - ½"	83 (3.3)	150 (5.91)	60 (2.4)	130 (5.1)	25 (0.98)	97 (3.8)	1.60 (3.53)	3.90 (8.60)
DN20 - ¾"	96 (3.8)					107 (4.21)	1.70 (3.75)	4.25 (9.37)
DN25 - 1"	108 (4.3)					117 (4.61)	1.95 4.30)	4.65 (10.3)

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P045-10) supplied with the product.

Installation note:

The valve should be installed in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve body.

BRV2SP and BRV2BP: When external pressure sensing is used, remove the blanking plug (**16**) and fit the ⅛" /6 mm O/D compression fitting (**17** supplied). The other end of the 6 mm sensing pipe should be connected into the downstream pipework at least 1 m (3.28 ft) downstream from the valve.

How to order

Example: 1 off Spirax Sarco DN15 BRV2S pressure reducing valve with SG iron body flanged EN 1092 PN25, stainless steel bellows and fitted with an orange spring for downstream pressure control of 3.5 to 8.6 bar g.

Spare parts

The spare parts available are shown in solid outline.
Parts drawn in a grey line are not supplied as spares.

Available spares

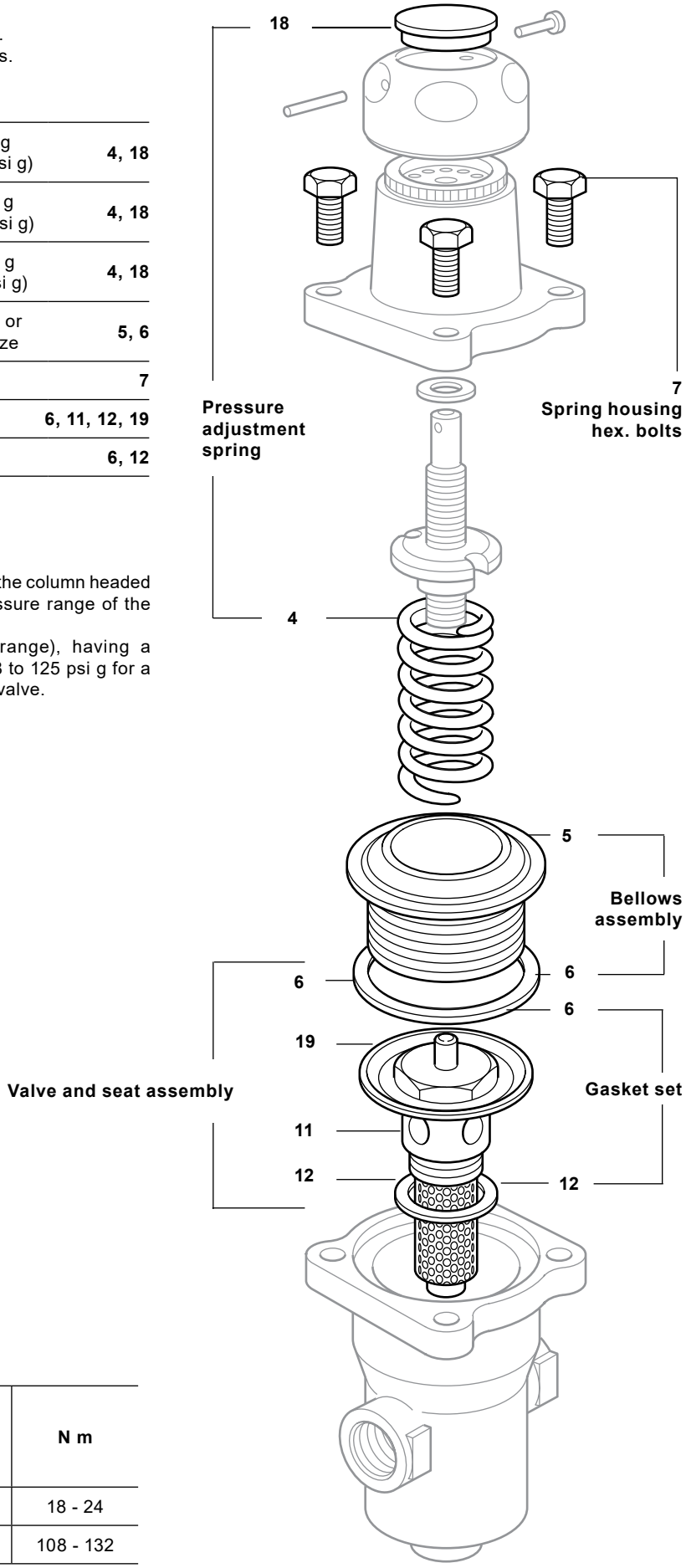
Pressure adjustment spring *	Grey	0.14 to 1.7 bar g (2.03 to 24.7 psi g)	**4, 18**
	Green	1.40 to 4.0 bar g (20.3 to 58.0 psi g)	**4, 18**
	Orange	3.50 to 8.6 bar g (50.8 to 125 psi g)	**4, 18**
Bellows assembly *	specify type	Stainless steel or phosphor bronze	**5, 6**
Spring housing hex. bolts (set of 4) *			**7**
Valve and seat assembly			**6, 11, 12, 19**
Gasket set *			**6, 12**

* Common to all sizes.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, type and pressure range of the reducing valve.

Example: 1 off Pressure adjustment spring (orange), having a downstream pressure range of 3.5 to 8.6 bar g 50.8 to 125 psi g for a Spirax Sarco DN15 (½") BRV2S pressure reducing valve.

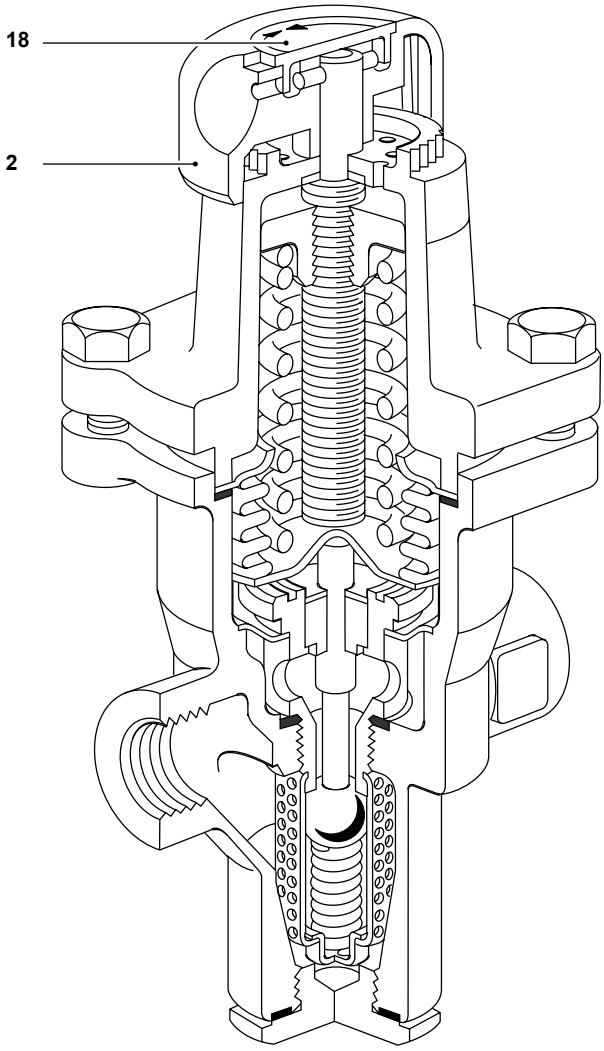


Recommended tightening torques

Item	Part	or mm	N m
7	Hex. bolts	M8 x 25	18 - 24
11	Valve seat	32 A/F	108 - 132

TI-P186-05
CTLS Issue 9

SRV2S
Stainless Steel
Pressure Reducing Valve



Description

The SRV2S is a compact, stainless steel, direct acting pressure reducing valve designed for applications using steam or gases such as compressed air. All wetted parts are constructed in 316L stainless steel. SRV2S pressure reducing valves are supplied with one of three colour coded springs which are identified by the disc (**18**) located on the adjustment handwheel (**2**):

Grey	For downstream pressure control:	0.14 to 1.7 bar g (2.03 to 24.7 psi g)
Green	For downstream pressure control:	1.40 to 4.0 bar g (20.3 to 58.0 psi g)
Orange	For downstream pressure control:	3.50 to 8.6 bar g (50.8 to 125 psi g)

Note: Where control spring ranges overlap always use the lower range to give better control.

Standards

This product fully complies with the requirements of the Pressure Equipment Directive (PED).

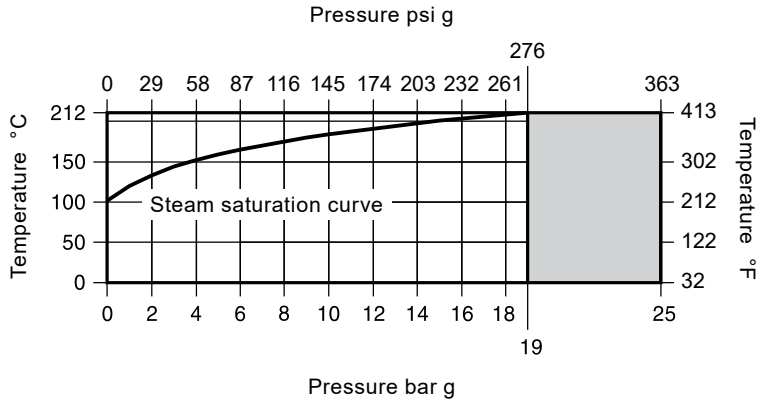
Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

½", ¾" and 1" screwed BSP (BS 21 Rp) or NPT.
DN15, DN20 and DN25 Flanged EN 1092 PN25 and ANSI 150.

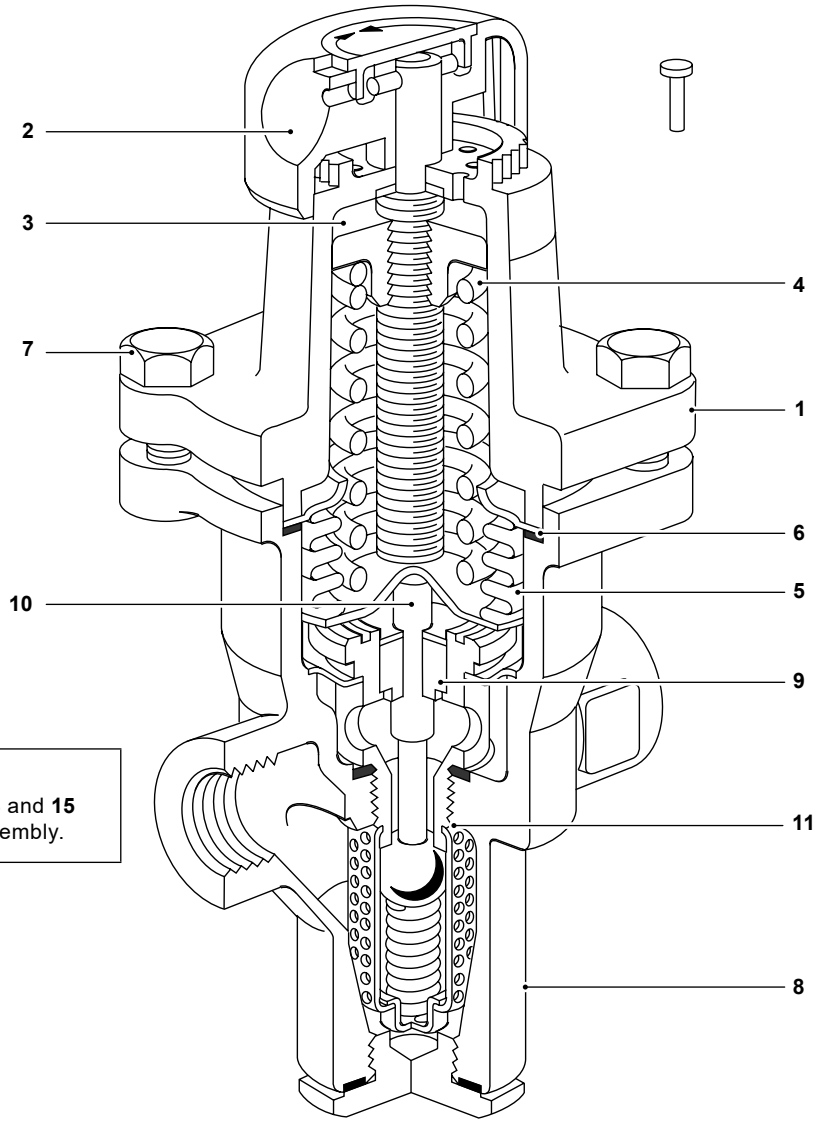
Pressure/temperature limits



The product **must not** be used in this region.

Body design conditions		PN25
Maximum design pressure	25 bar g @ 120 °C	363 psi g @ 248 °F
Maximum design temperature	212 °C @ 19 bar g	414 °F @ 276 psi g
Minimum allowable temperature	0 °C	32 °F
Maximum operating pressure for saturated steam service	19 bar g	276 psi g
Maximum operating temperature	212 °C @ 19 bar g	414 °F @ 276 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco	0 °C	32 °F
Maximum downstream reduced pressure	8.6 bar g	125 psi g
Maximum differential pressure	19 bar	276 psi
Maximum recommended turndown ratio 10:1 at maximum flow		
Designed for a maximum cold hydraulic test pressure of: **Note:** With internals fitted, test pressure must not exceed:	38 bar g 19 bar g	551 psi g 276 psi g

Materials

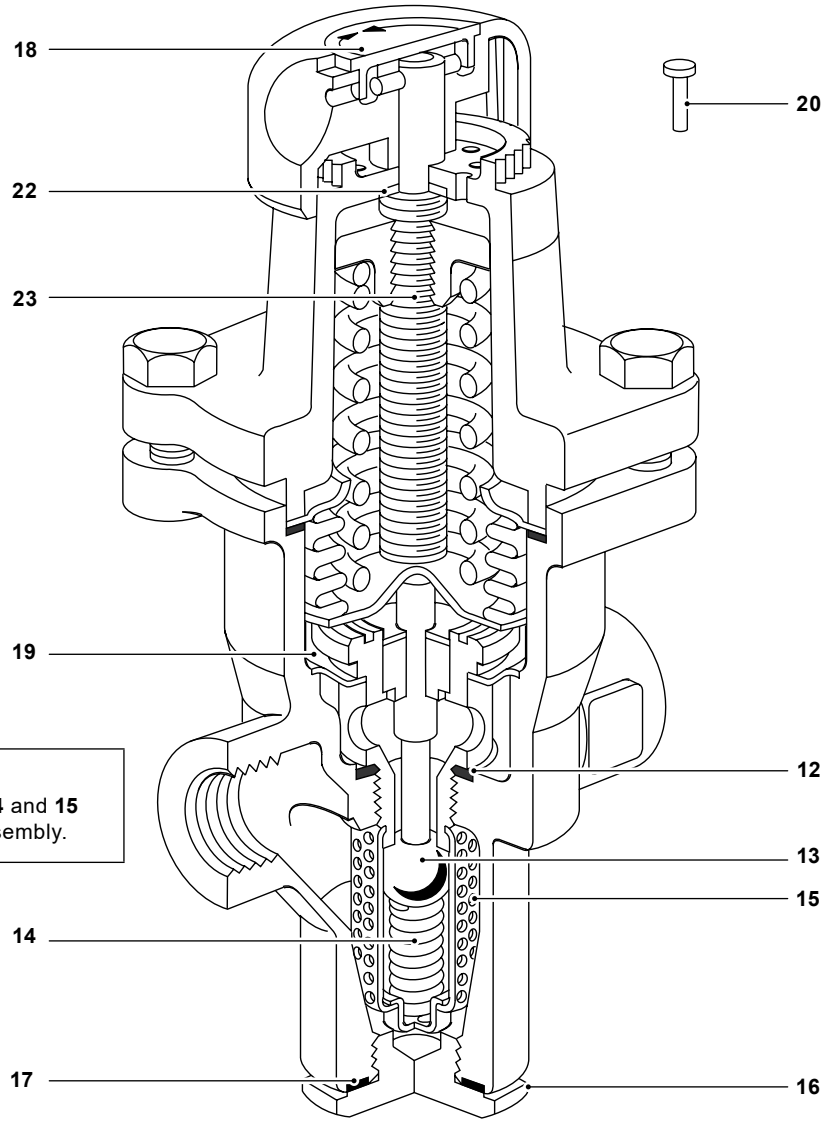


Note:
Items **9**, **10**, **11**, **13**, **14** and **15** are all part of one assembly.

No.	Part	Material	
1	Spring housing	Aluminium	LM6 Electroless nickel finish
2	Adjustment handwheel	Plastic	Polypropylene
3	Top spring plate	Cast iron	DIN 1691 GG 20 Electroless nickel finish
4	Pressure adjustment spring	Silicon chrome spring steel	BS 2803 685 A55 Range 2 Electroless nickel finish
5	Bellows assembly	Stainless steel	316Ti/316L
6	Bellows assembly gasket	Reinforced exfoliated graphite	
7	Hex. bolt (M8 x 25 mm)	Stainless steel	BS 6105 A 270
8	Body	Stainless steel	DIN 1.4404 BS 3100 316 C12 ASTM A351 CF 3M External electropolish finish
9	Guide bush	Graphite filled PTFE	
10	Pushrod	Stainless steel	ASTM A276 316L BS 3100 316 C 12
11	Valve seat	Stainless steel	ASTM A351 CF 3M DIN 1.4404

Materials continued on next page

Materials (continued)



Note:
Items **9**, **10**, **11**, **13**, **14** and **15** are all part of one assembly.

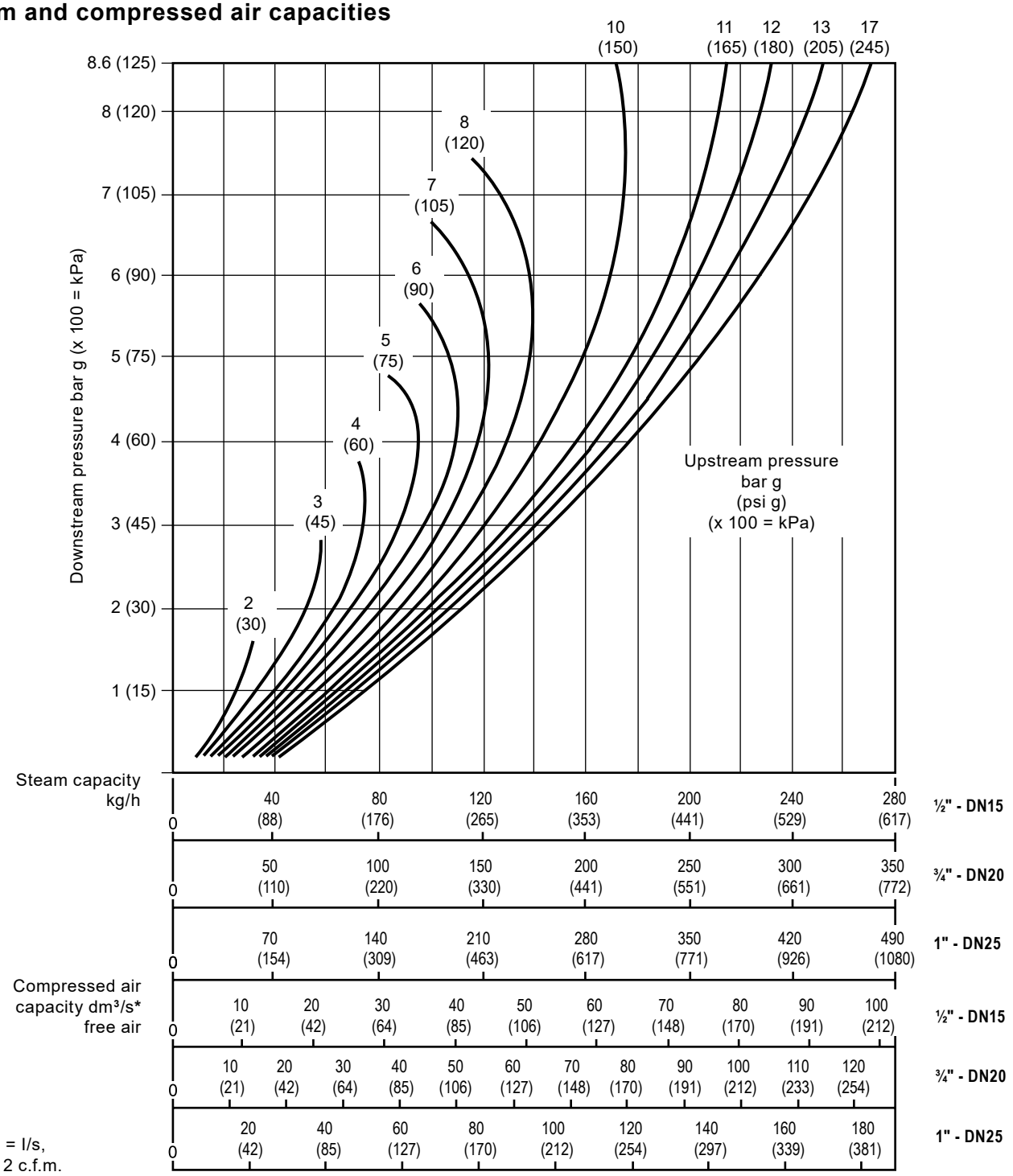
No.	Part	Material	
12	Valve seat gasket	Stainless steel	BS 1449 316 S11
13	Valve	Stainless steel	316L
14	Valve return spring	Stainless steel	BS 2056 316 S42
15	Strainer screen	Stainless steel	BS 1449 316 SH
16	Bottom cap	Stainless steel	ASTM A276 316L
17	Bottom 'O' ring	PTFE	
18	Spring range identity disc	Plastic	Polypropylene
19	Bulkhead plate	Stainless steel	BS 1449 316 S13 AISI 316L
20	Tamper-proof pin	Mild steel copper plated	
21	Flanges (not shown)	Stainless steel	DIN 1.4404 BS 3100 316 C12 ASTM A351 CF 3M Electropolish finish
22	Washer	Stainless steel	316L
23	Drive spindle	Carbon steel	BS 970 230 M07 Electroless nickel finish

Capacities for safety valve sizing

Full lift capacities for safety valve sizing purposes :	Size	DN15 (½")	DN20 (¾")	DN25 (1")
	Kv	1.5	2.5	3.0

For conversions:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

Steam and compressed air capacities



* dm³/s = l/s,
1 l/s ≙ 2 c.f.m.

How to use the chart

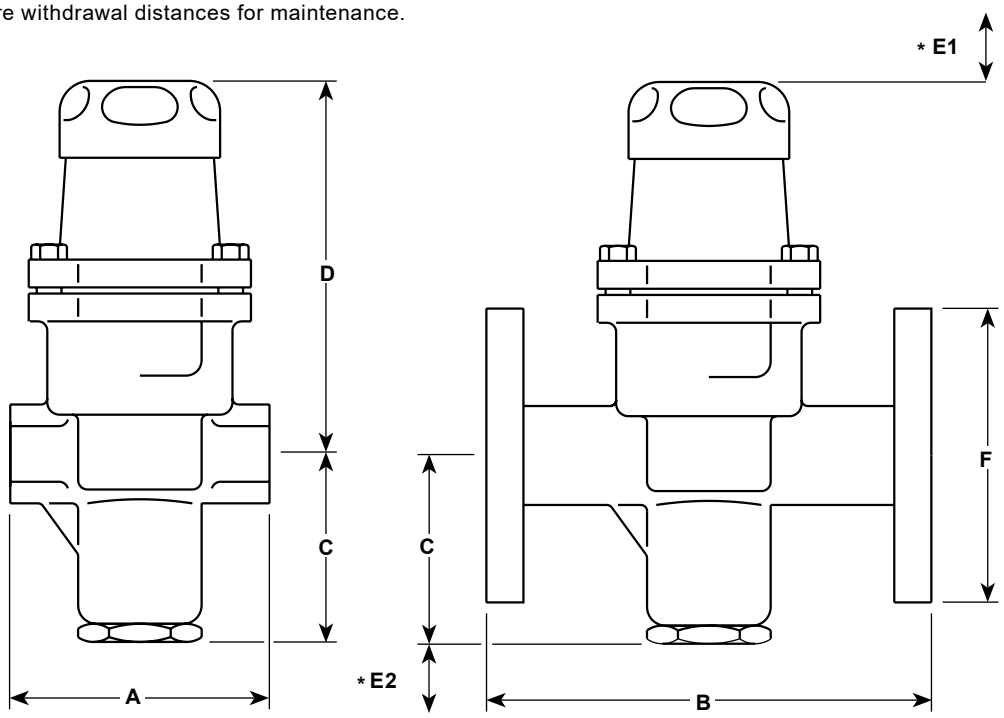
The curved lines labelled 2, 3, 4, 5 etc., represent upstream pressures. Downstream pressures are read along the vertical line on the left hand side of the chart.

How to use the chart is best described by an example:-
Required, a pressure reducing valve to pass 120 kg/h reducing from 8 to 6 bar. From the downstream pressure of 6 bar on the left hand side of the chart extend out horizontally until the line meets the curved 8 bar upstream line. At this point read vertically downwards where it will be seen that a ½" SRV2S will be required.

Dimensions/weights (approximate) in mm (in) and kg (lb)

Size		A	B		C	D	* E1	* E2	F	Weight Screwed	Weight Flanged
½"	BSP/NPT	83 (3.3)								1.48 (3.26)	
DN15	PN25		150 (5.91)						97 (3.82		3.1 (6.83)
	ANSI 150			140 (5.51)					91 (3.58)		2.4 (5.29)
¾"	BSP/NPT	96 (3.8)								1.58 (3.48)	
DN20	PN25		150 (5.91)		62 (2.4)	130 (5.1)	25 (0.98)	15 (0.59)	107 (4.21)		3.8 (8.38)
	ANSI 150			140 (5.51)					100 (3.94)		2.8 (6.17)
1"	BSP/NPT	108 (4.3)								1.70 (3.75)	
DN25	PN25		160 (6.3)						117 (4.61)		4.4 (9.7)
	ANSI 150			153 (6.02)					110 (4.33)		3.6 (7.94)

* **Note: E1** and **E2** are withdrawal distances for maintenance.



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P186-03) supplied with the product.

Installation note:

The valve should be installed in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve body.

How to order

Example: 1 off Spirax Sarco ½" screwed BSP SRV2S pressure reducing valve with stainless steel body and bellows, fitted with an orange spring for a downstream pressure control of 3.5 to 8.6 bar g (50.8 to 125 psi g).

Spare parts

The spare parts available are shown in heavy outline.
Parts drawn in a grey line are not supplied as spares.

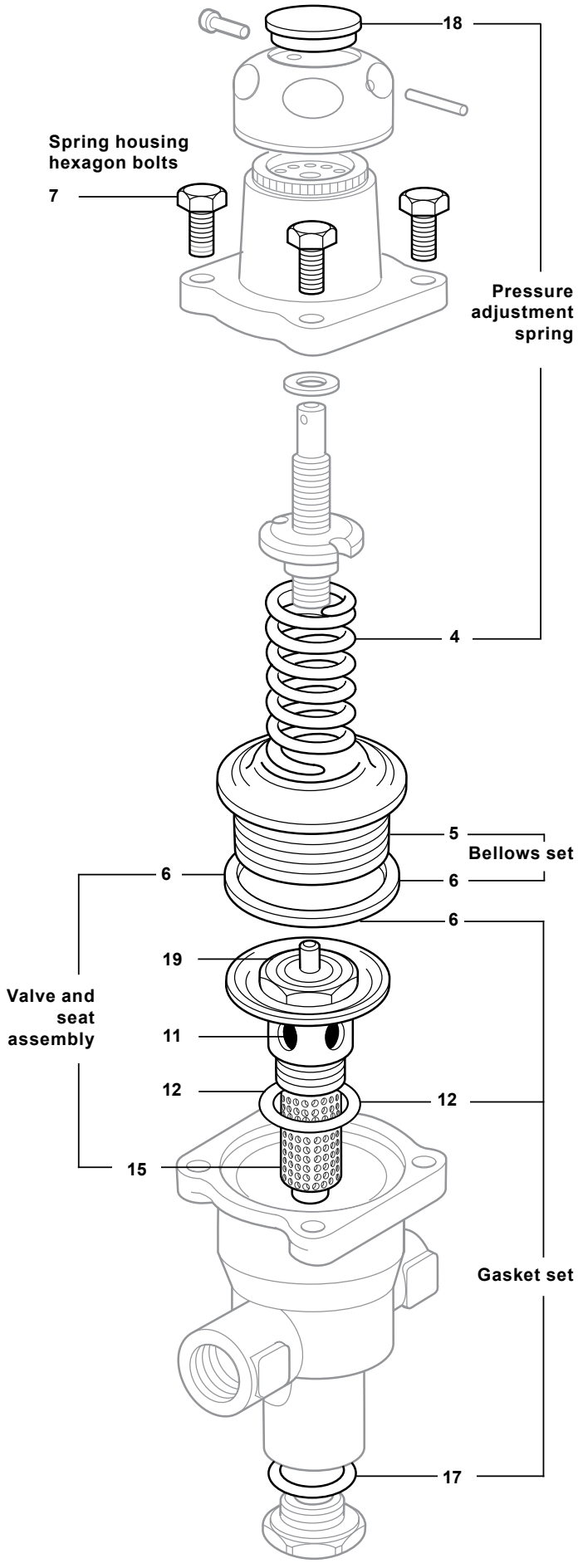
Available spares

* Pressure adjustment spring	**Grey**	0.14 to 1.7 bar g (2.03 to 24.7 psi g)	**4**, **18**
	Green	1.40 to 4.0 bar g (20.3 to 58.0 psi g)	**4**, **18**
	Orange	3.50 to 8.6 bar g (50.8 to 125 psi g)	**4**, **18**
* Bellows (Stainless steel)			**5**, **6**
* Spring housing hex. bolts (set of 4)			**7**
Valve and seat assembly			**6**, **11**, **12**, **15**, **19**
* Set of gaskets/'O' rings			**6**, **12**, **17**

* Common to all sizes.

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, type and pressure range of the reducing valve.
Example: 1 off Pressure adjustment spring (orange), having a downstream pressure range of 3.5 to 8.6 bar g (50.8 to 125 psi g) for a Spirax Sarco DN15 (½") SRV2S pressure reducing valve.



TI-P210-01
CTLS Issue 6

BRV71 and BRV73
SG Iron
Pressure Reducing Valves

Description

The **BRV71** (screwed) and **BRV73** (flanged) are SG iron bodied direct acting pressure reducing valves designed for applications using steam.

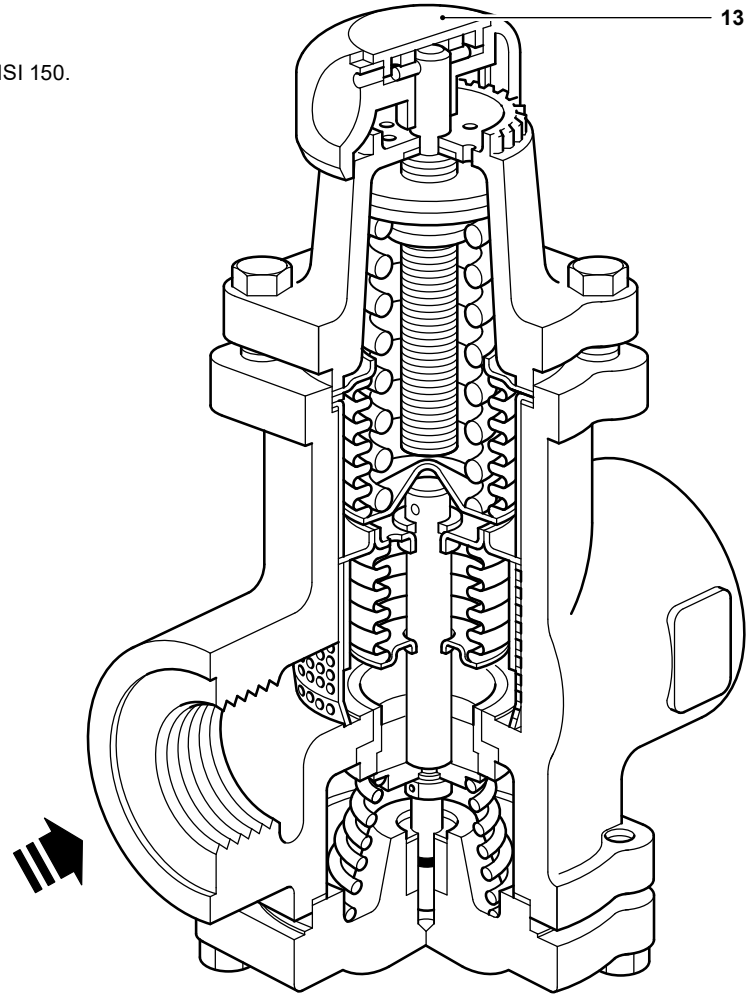
The **BRV71** and **BRV73** pressure reducing valves are supplied with one of three colour coded springs which are identified by the disc (**13**) located on the adjustment handwheel:

Grey	For downstream pressure control:	0.14 to 1.7 bar g (2.03 to 24.7 psi g)
Green	For downstream pressure control:	1.40 to 4.0 bar g (20.3 to 58.0 psi g)
Orange	For downstream pressure control:	3.50 to 9.0 bar g (50.8 to 131 psi g)

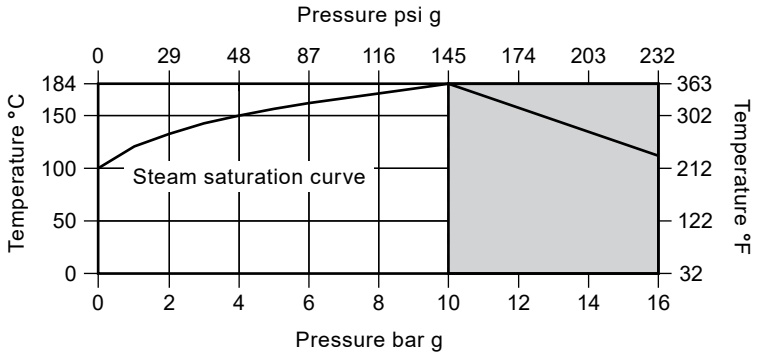
Note: Where control spring ranges overlap always use the lower range to give better control.

Sizes and pipe connections

1", 1¼", 1½" and 2" screwed BSP and NPT.
DN25, DN32, DN40 and DN50 flanged PN16, JIS 10 and ANSI 150.



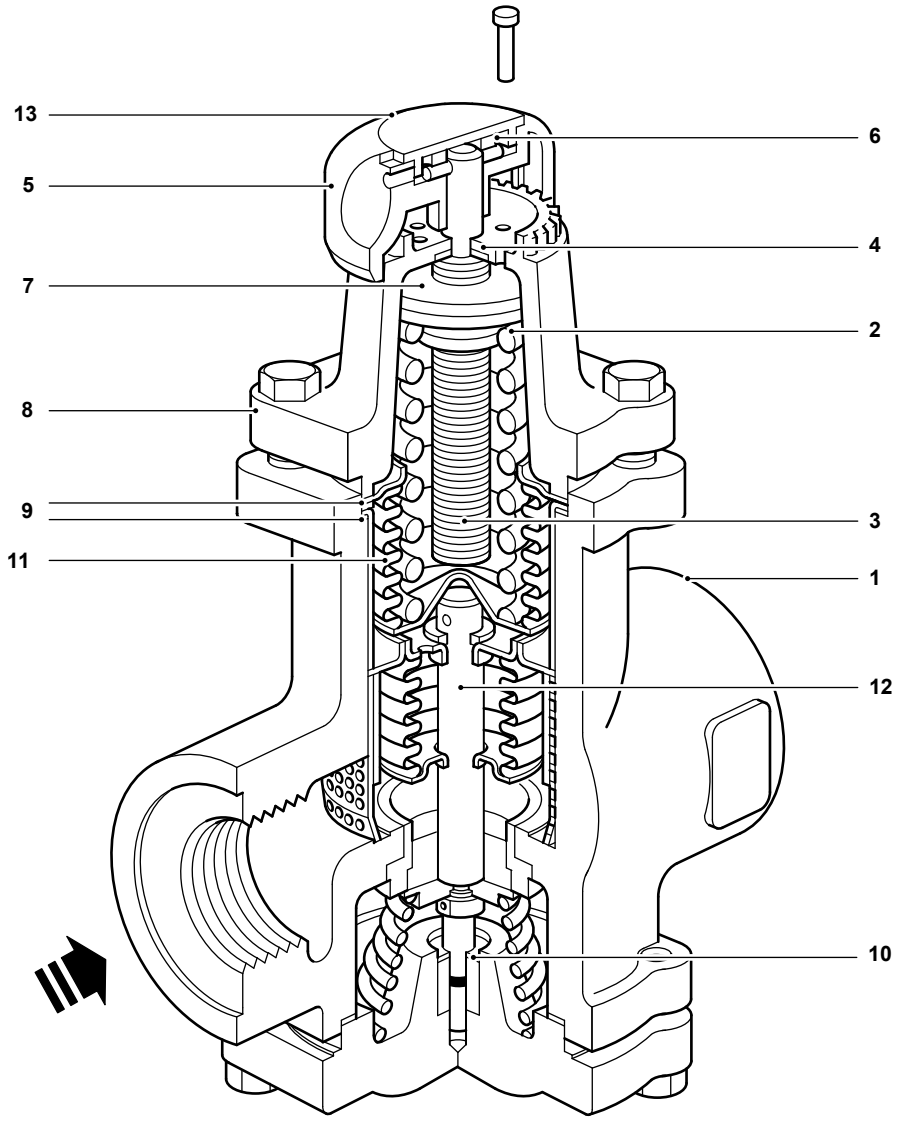
Pressure/temperature limits



The product **must not** be used in this region.

Body design conditions		PN16
Maximum allowable pressure	16 bar g @ 120 °C	232 psi g @ 248 °F
Maximum allowable temperature	184 °C @ 10 bar g	363 °F @ 145 psi g
Minimum allowable temperature	- 10 °C	14 °F
Maximum operating pressure for saturated steam service	10 bar g	145 psi g
Maximum operating temperature	184 °C @ 10 bar g	363 °F @ 145 psi g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco.	0 °C	32 °F
Maximum downstream reduced pressure	9 bar g	131 psi g
Maximum differential pressure	10 bar	145 psi
Designed for a maximum cold hydraulic test pressure of:	24 bar g	348 psi g
Note: With internals fitted, test pressure must not exceed:	16 bar g	232 psi g

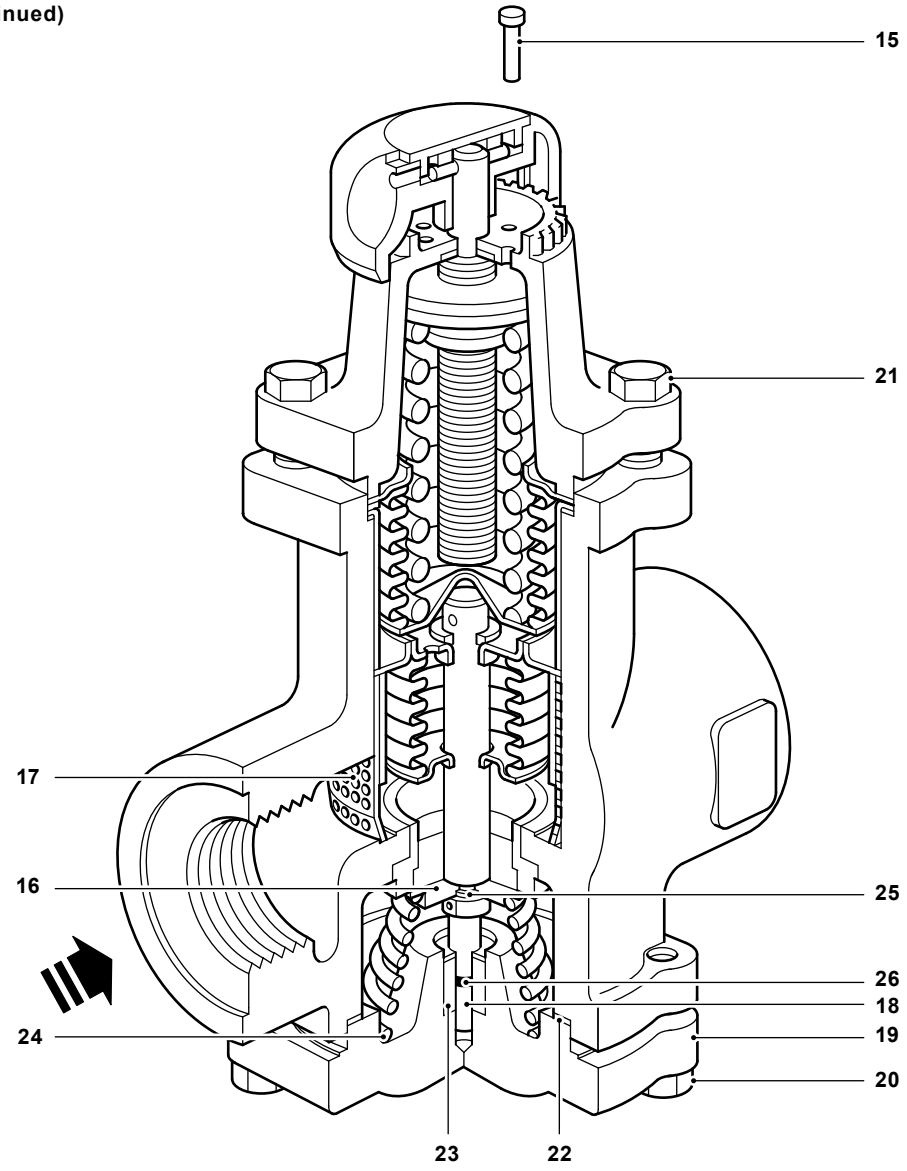
Materials



No.	Part	Material	
1	Body assembly	SG iron	DIN 1693 GGG 40.3 ELNP coated
2	Pressure adjustment control spring	Silicon chrome	BS 2803 685 A55
3	Adjustment screw	Carbon steel	BS 970 230 M07
4	Plain washer	Stainless steel	Gr.18/10/3-4A
5	Adjustment knob	Mineral filled nylon 66	10B 140
6	Spirol pin	Chrome plated stainless steel	AISI 420
7	Spring plate	Cast iron	DIN 1691 GG 20
8	Spring housing	Aluminium	2ELNP coated
9	Upper gasket	Semi-rigid graphite laminated	
10	Lower gasket	Semi-rigid graphite laminated	
11	Bellows assembly	Stainless steel	316L
12	Bellows/pushrod assembly	Stainless steel/PTFE 15% graphite fill	316L
13	Printed cap	Polypropylene	

Materials continued on next page

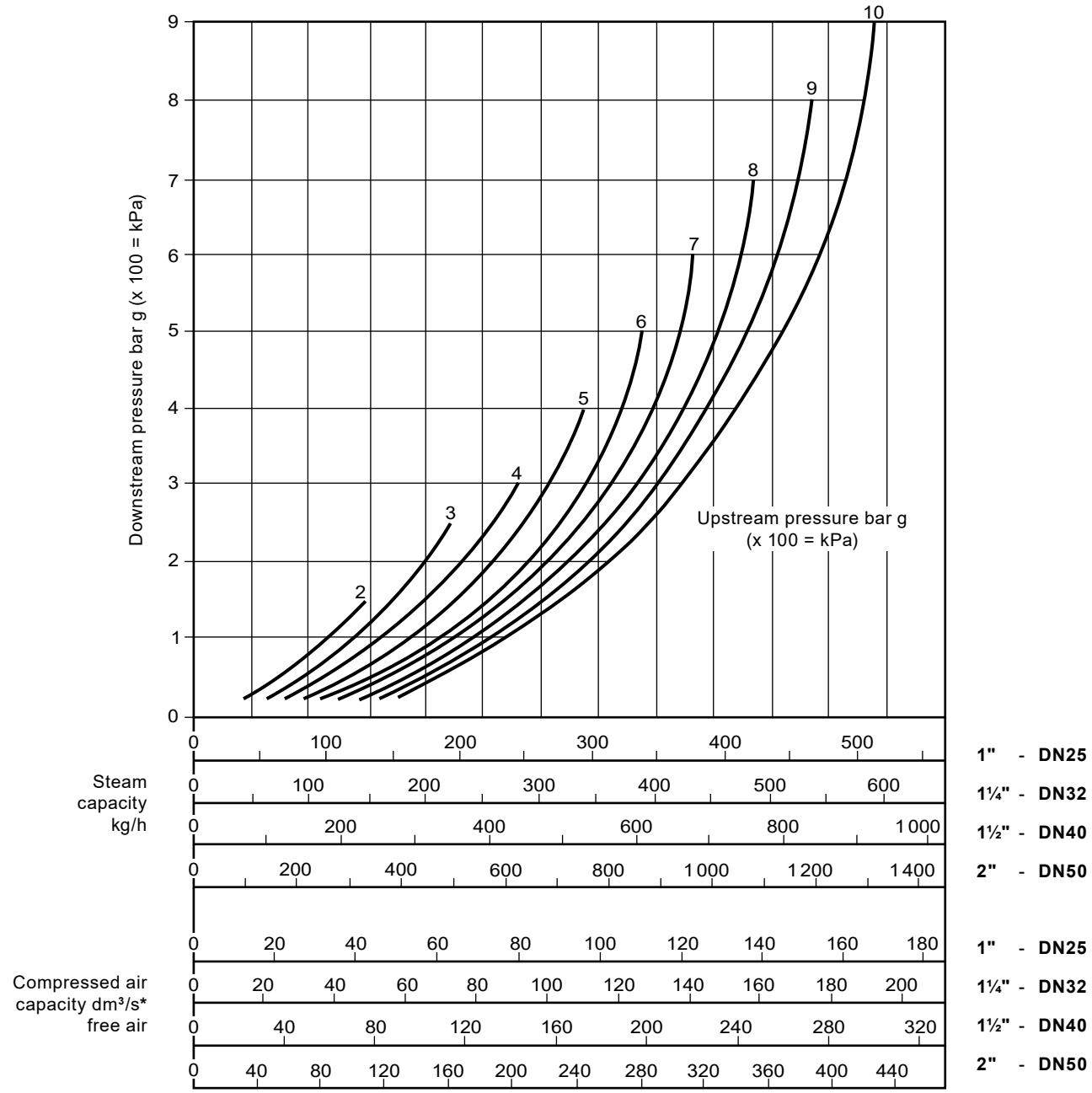
Materials (continued)



No.	Part	Material	
15	Locking pin	Copper	
16*	Head (incorporating seal Pt No.27)	Stainless steel	BS 970 431 S29
17	Screen	Stainless steel	316L
18	Lower pushrod	Stainless steel	BS 970 431 S29
19	End cap	SG iron	DIN 1693 GGG 40.3 ELNP coated
20	Screw	Zinc plated steel	BS 3692 Gr. 8.8
21	Screw	Zinc plated steel	BS 3692 Gr. 8.8
22	Washer	Stainless steel	BS 1449 304 515
23	Guide bush	PTFE 15% graphite filled	
24	Return spring	Stainless steel	BS 2056 316 S42
25	PTFE washer	Virgin PTFE	BS 6564 Type 2 Gr. B
26	'O' ring seal	EPDM	E 0962-90
27*	Head 'O' ring seal	EDPM	E 0962-90

***Note:** Parts **16** and **27** are not shown.

Steam and compressed air capacity chart



* dm³/s = l/s, 1 l/s ≙ 2 c.f.m.

How to use the chart

The curved lines labelled 2, 3, 4, 5 etc., represent upstream pressures. Downstream pressures are read along the vertical line on the left hand side of the chart.

How to use the chart is best described by an example:-

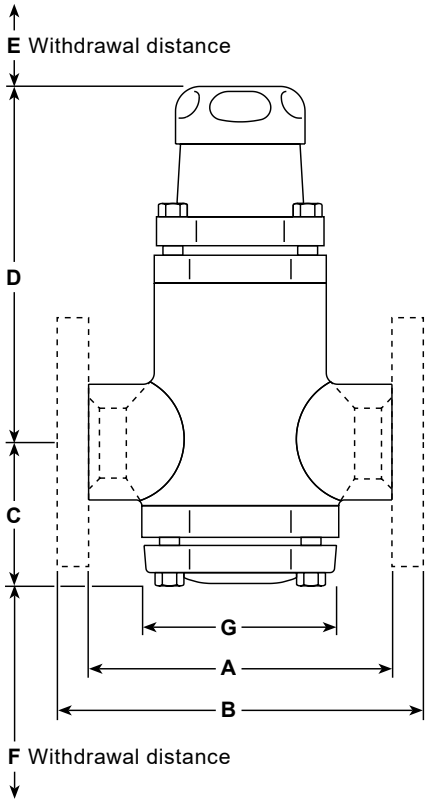
Required, a pressure reducing valve to pass 350 kg/h reducing from 8 to 6 bar. From the downstream pressure of 6 bar on the left hand side of the chart extend out horizontally until the line meets the curved 8 bar upstream line. At this point read vertically downwards where it will be seen that DN25 BRV71 or BRV73 will be required.

Kv values

Full lift capacity for safety valve sizing purposes are shown below:

Size	1" - DN25	1¼"- DN32	1½"- DN40	2" - DN50	For conversion:
Kv	9.3	11.1	15.7	16.2	Cv (UK) = Kv x 0.963 Cv (US) = Kv x 1.156

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size	Scr. BSP/NPT A	PN16 B	ANSI 150 B	JIS 10 B	C	D	E	F	G	Weight Scr.	Weight *Flg
DN25 - 1"	134 (5.28)	174 (6.85)	170 (6.69)	170 (6.69)	67 (2.64)	153 (6.02)	90 (3.54)	25 (0.98)	84 (3.31)	4.40 (9.7)	5.90 (13)
DN32 - 1¼"		179 (7.05)	174 (6.85)	175 (6.89)						4.20 (9.26)	7.65 (16.9)
DN40 - 1½"		186 (7.32)	183 (7.20)	180 (7.09)						4.95 (10.9)	8.55 (18.8)
DN50 - 2"			186 (7.32)							4.75 (10.5)	9.40 (20.7)

***Note:** Flanged weights are typical of the BRV73 model and the figures quoted are based on the PN16 version.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P210-04) supplied with the product.

Installation note:

The valve should be installed in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve body.

How to order

Example: 1 off Spirax Sarco 1" screwed BSP BRV71 pressure reducing valve with SG iron body, stainless steel bellows and fitted with an orange spring for a downstream pressure control of 3.5 to 9.0 bar g (50.8 to 131 psi g).

Spare parts

The spare parts available are shown in solid outline.
Parts drawn in a grey line are not supplied as spares.

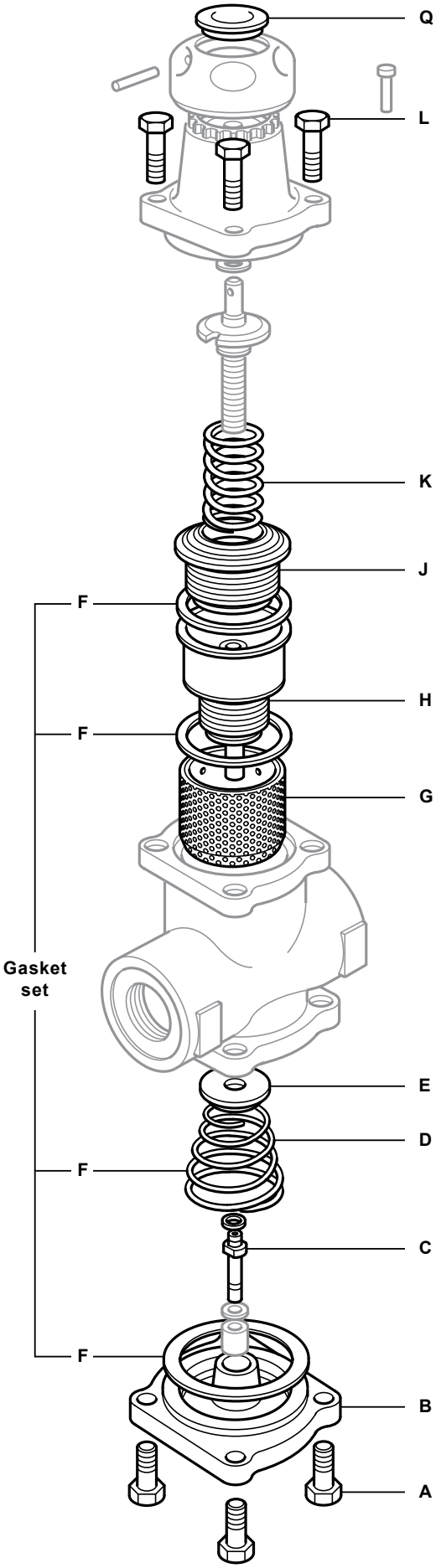
Available spares

Note the spares listed are common to all sizes

Pressure adjustment spring	Grey	0.14 to 1.7 bar g (2.03 to 24.7 psi g)	K, Q
	Green	1.40 to 4.0 bar g (20.3 to 58.0 psi g)	K, Q
	Orange	3.50 to 9.0 bar g (50.8 to 131 psi g)	K, Q
Control bellows - Stainless steel			J
Bellows pushrod assembly, (Sub assembly, head, 'O' rings, lower pushrod and balancing bellows)			E, C, H
Bottom cap			B
Strainer screen			G
Return spring and gasket set			F
Bolt set	Spring housing	(Set of 4)	L
	Bottom cap	(Set of 4)	A
Return spring			D

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, type and pressure range of the reducing valve.
Example: 1 off Pressure adjustment spring (orange), having a downstream pressure range of 3.5 to 9.0 bar g (50.8 to 131 psi g) for a Spirax Sarco 1" BRV71 pressure reducing valve.



TI-S39-01-US
Issue 1

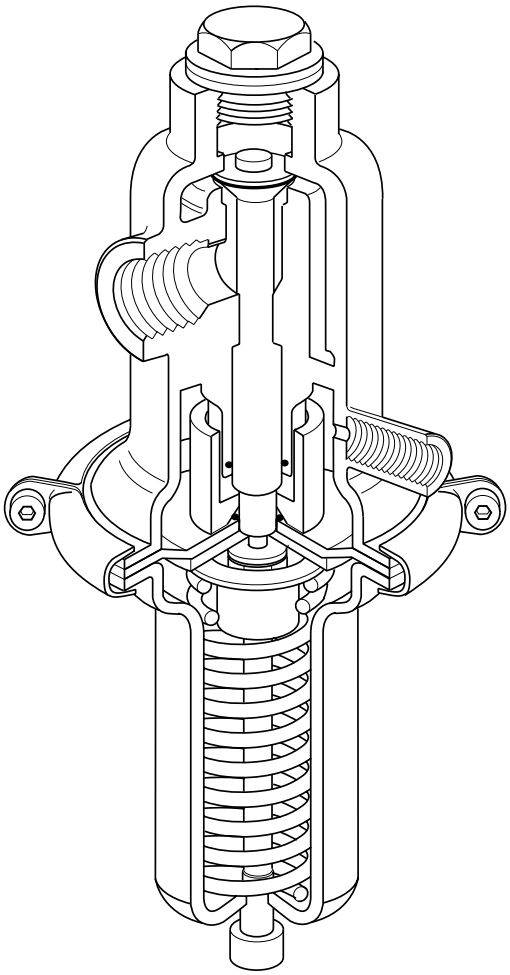
Stainless Steel Direct Operated Pressure Regulator SRV461/463

Description

Types SRV461/463 Direct Acting Pressure Reducing Valve with non-rising adjustment screw, O-ring soft seal on valve plug for tight ANSI Class VI shutoff, and 316 Ti stainless steel construction for wetted parts.

Model	SRV461	SRV463
Sizes	½", ¾"*, 1", 1¼", 1½", 2" (DN15, DN20, DN25, DN32, DN40, DN50)	
Plug connections	NPT	ANSI 150
Construction	316 Ti Stainless Steel, EPDM	Diaphragm, TFE O-ring Seal
Options	BSP Connections	DIN PN16 or BS4504 flanges
	SRV461S and SRV463S for Hydrocarbon Service - Consult Factory	
	Non-Standard Pressure Ranges	

* ¾" is flanged only



Typical applications

Clean steam, gas, and liquid supplies to bioreactors, centrifuges, freeze dryers (lyophilizers), sterilizers, autoclaves, process tanks, production suites, humidifiers, and culinary equipment.

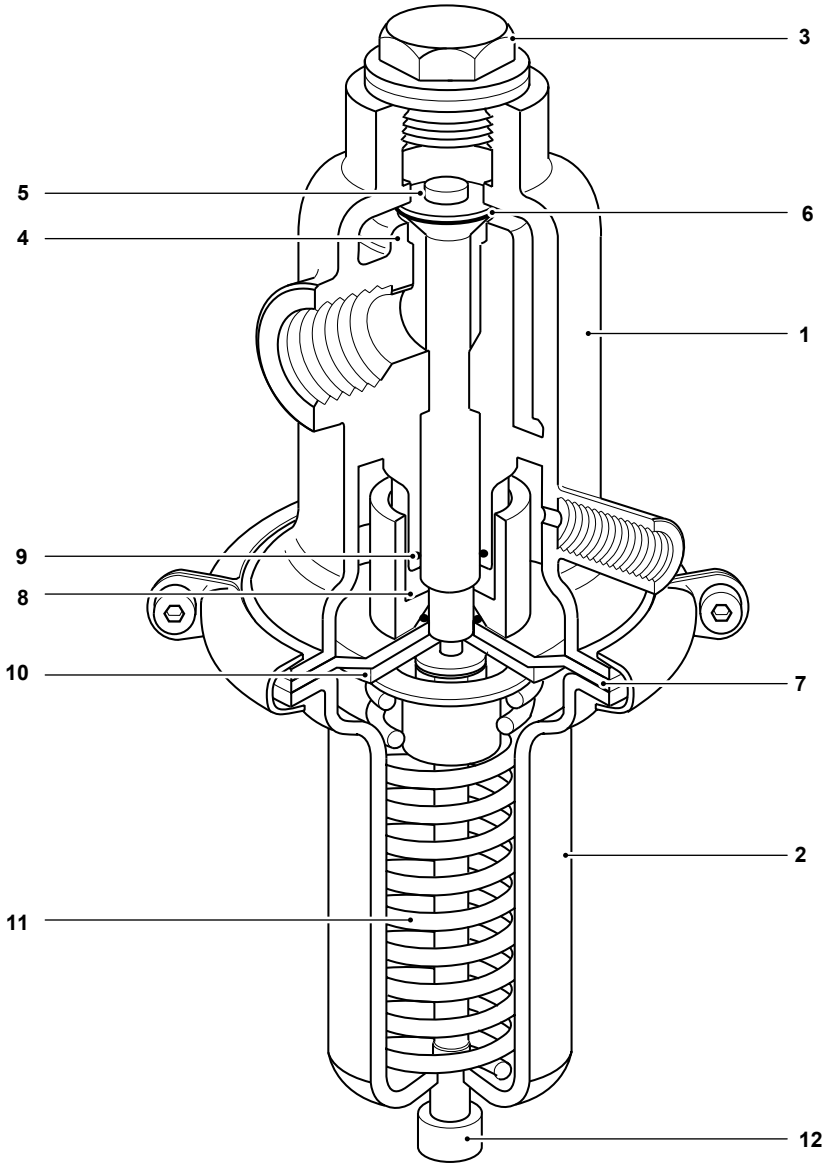
Limiting operating conditions

Maximum operating pressure (PMO)		174 psi g (12 bar g)
Maximum operating temperature	Steam service:	374 °F (190 °C)
	Liquid and gas service:	266 °F (130 °C) at all operating pressures

Pressure shell design conditions

PMA	Maximum allowable pressure	220 psi g/0-122 °F	(15 bar g/0-50 °C)
		187 psi g/302 °F	(13 bar g/150 °C)
		174 psi g/374 °F	(12 bar g/190 °C)
TMA	Maximum allowable temperature	374 °F/0-174 psi g	(190 °C/0-12 bar g)
Pressure ranges		4 – 16 psi	(0.3 – 1.1 bar)
		12 – 36 psi	(0.8 – 2.5 bar)
		30 – 75 psi	(2.1 – 5.2 bar)

Materials



No.	Part	Material	Werkstoff no.	AISI equivalent*
1	Body	Stainless steel	1.4571	316 Ti
2	Spring housing	Stainless steel	1.4404	316L
3	Cap	Stainless steel	1.4571	316 Ti
4	Valve seat	Stainless steel	1.4571	316 Ti
5	Valve plug	Stainless steel	1.4571	316 Ti
6	O-Ring seal	TFE		
7	Diaphragm	EPDM		
8	Piston	Stainless steel	1.4571	316 Ti
9	O-Ring	EPDM		
10	Top spring plate	Stainless steel	1.4571	316 Ti
11	Spring	Stainless steel	1.4310	301
12	Adjustment screw	Stainless steel	1.4571	316 Ti

* not direct equivalents, nearest AISI specification is given.

Capacities

Capacities can be calculated from 20% offset (droop) values opposite

Size		Cv	Kv
½"	DN15	4.7	4
¾"	DN20	5.9	5
1"	DN25	7.0	6
1¼"	DN32	14.0	12
1½"	DN40	18.7	16
2"	DN50	21.1	18

Sizing notes

1) Maximum capacities can be obtained only at the upper end of each pressure range. Therefore, to ensure quoted capacities always select lowest pressure range option compatible with required downstream pressure.

2) Because of valve droop characteristics, it is recommended that only 80% of the "fully open capacity indices" be used for sizing.

3) Required Cv's can be calculated from the following formulae:

For steam:

Establish whether the flow is critical or non-critical, and calculate the required Cv using one of the following formula:

For liquids

$$Cv = GPM \frac{\text{Sp. Gr}}{\sqrt{\text{Pressure Drop, psi}}}$$

Where
Sp. Gr. Water = 1
GPM = Gallons per minute

For steam (saturated)

a. Critical Flow

When ΔP is greater than $F_L^2 (P_1/2)$

$$Cv = \frac{W}{1.83 F_L P_1}$$

b. Noncritical Flow

When ΔP is less than $F_L^2 (P_1/2)$

$$Cv = \frac{W}{2.1 \sqrt{\Delta P (P_1 + P_2)}}$$

Where:

P_1 = Inlet Pressure psi a

P_2 = Outlet Pressure psi a

W = Capacity lb/hr

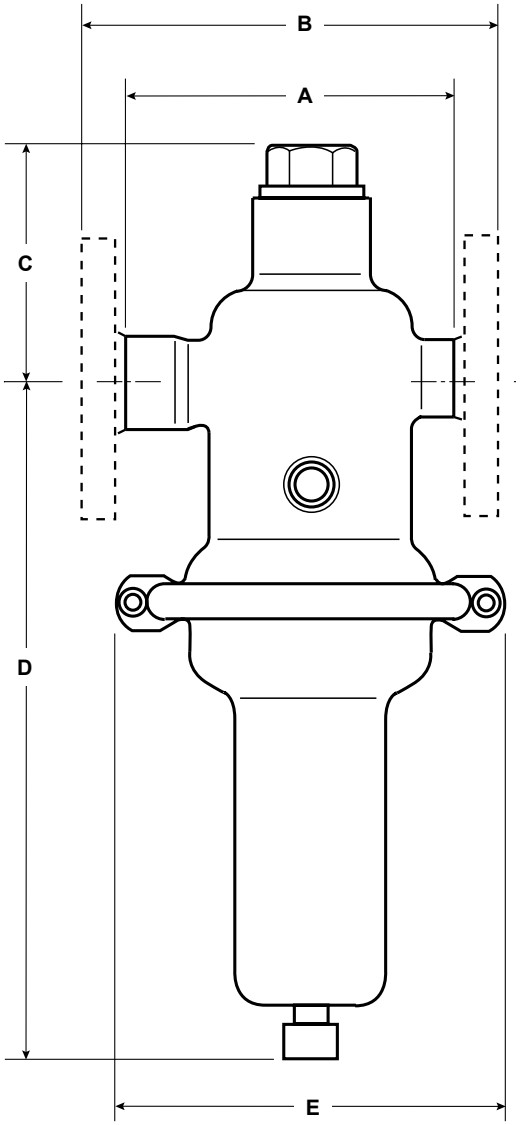
F_L = Pressure Recovery Factor
(.9 on globe pattern valves for flow to open)
(.85 on globe pattern valves for flow to close)

Sample specification

Stainless steel direct acting pressure reducing valves shall be diaphragm actuated with all 316Ti grade body and a soft O-ring seal for ANSI Class VI shutoff.
Pressure setting on valves shall be adjustable while in service with maximum capacities rated for droop not to exceed 20%.
Valve body shall be of packless design.
Spirax Sarco SRV461 (screwed) SRV463 (flanged).

Dimensions (approximate) in inches (*mm*)

Size	A	B	C	D 4-16	D 12-36 (30-75)	E 4-16	E 12-36 (30-75)
½"	3.4 (86)	5.1 (130)	3.0 (76)	11.8 (300)	9.3 (236)	7.9 (201)	5.4 (138)
¾"		5.9 (150)	3.0 (76)				
1"	3.4 (86)	6.3 (160)	3.0 (76)				
1¼"	5.1 (130)	7.1 (180)	3.5 (29)				
1½"	5.7 (145)	7.9 (201)					
2"	7.3 (185)	9.1 (231)					



Weights (approximate) in lbs (*kg*)

setting ranges		screwed		flanged	
psi	bar	½"-1"	1¼"-2"	½"-1"	1¼"-2"
4-16	0.3-1.1	13.5 (6.1)	15.4 (7)	17.4 (7.9)	24.2 (11.0)
12-36	0.8-2.5	6.5 (2.9)	8.8 (4.0)	10.8 (4.9)	13.2 (6.0)
30-75	2.1-5.1				

See Installation & Maintenance Instructions IMI 3.110 supplied with each valve.

Maintenance

This product can be maintained without disturbing the piping connections. Complete isolation of the valve from supply is required before any servicing is performed.

The valve should be disassembled periodically for inspection and cleaning of the valve head and seat.

Worn or damaged parts should be replaced . Please refer to Spare Parts list for replacement parts. Complete installation and maintenance instructions are given in IMI 3.110 which accompanies the product.

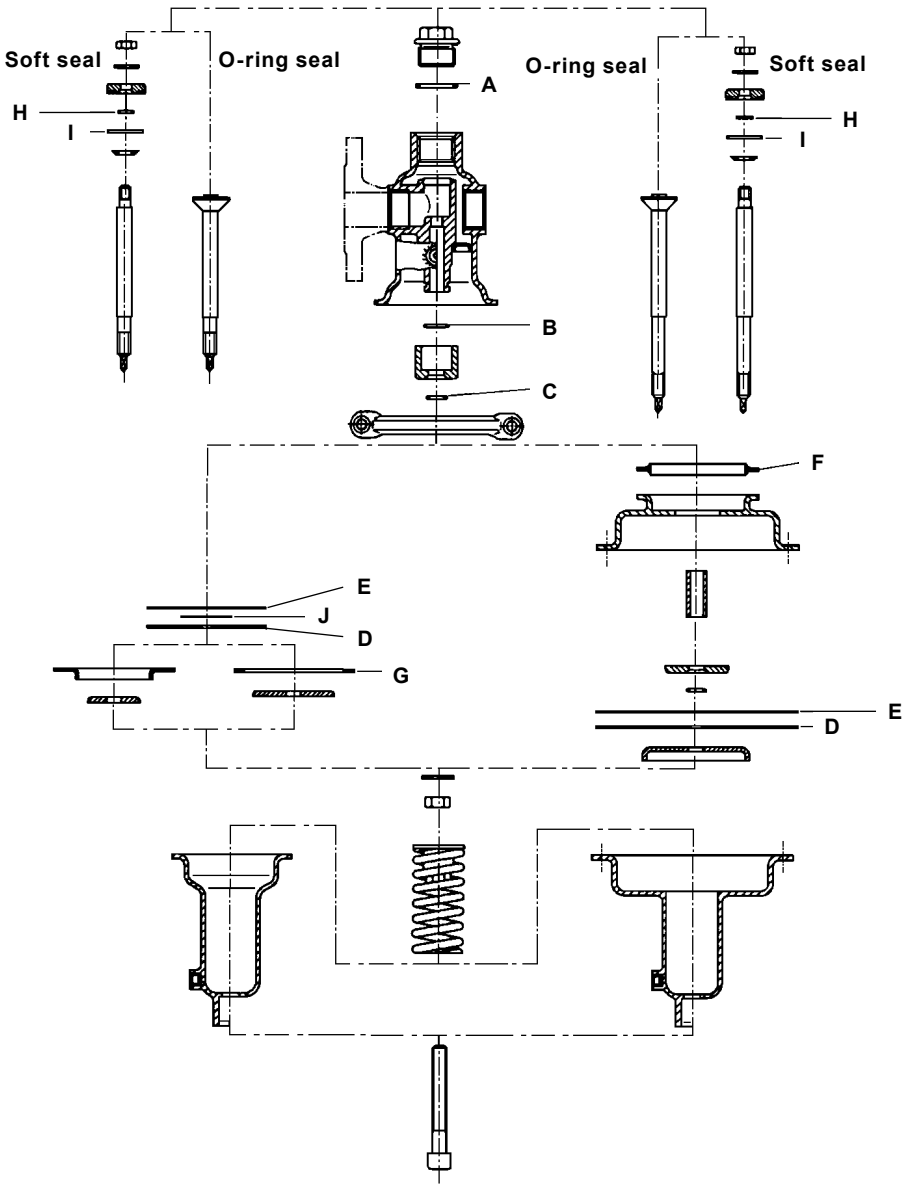
Spare parts and repair kit

Standard spare parts are those shown numbered in the diagram. Additional spares may be available upon request.

Always order spares by using the description in the first column, and by stating size, type, pressure range and valve seal type for the reducing valve.

Valves with pressure ranges 12-36 psi and 30-75 psi (0.82-2.48 bar and 2.06-5.17 bar)

Valves with pressure range 4-16 psi (0.27 bar)



Repair kit – SRV461/463	½"-1"	DN15-25	**A, B, C, D, E, F, G**
Repair kit – SRV461S/463S	½"-1"	DN15-25	**A, B, C, D, E, F, G, H, I**
Repair kit – SRV461/463	1¼"-2"	DN32-50	**A, B, C, D, E, F, G, J**
Repair kit – SRV461S/463S	1¼"-2"	DN32-50	**A, B, C, D, E, F, G, H, I, J**
Item J—Sizes	1¼" and larger only		

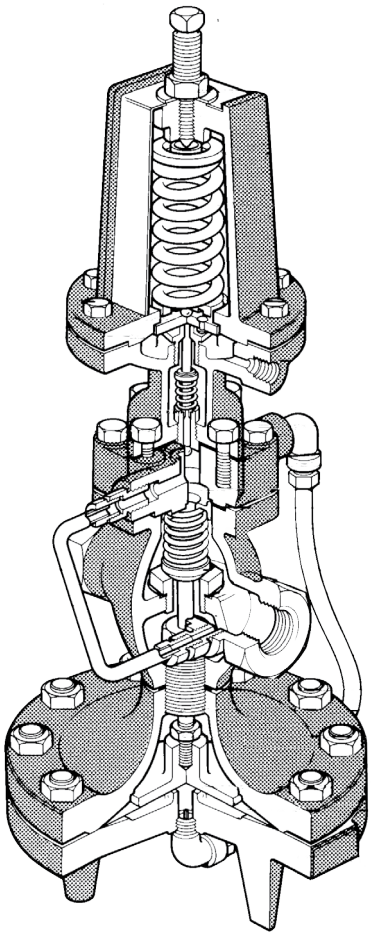
TI-P235-05-US
Issue 4

Pilot Operated Pressure Regulator
½" to 4" 25P

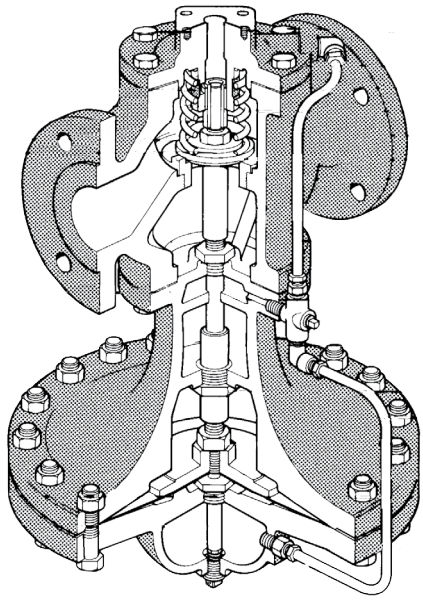
Description

The 25P is a self-actuated pilot-operated pressure regulator. Downstream pressure is fed back through an external sensing line to the pressure pilot, which adjusts the opening of the main valve so as to maintain the set pressure. The main valve can close tight for ANSI/FCI 70-2 Class IV shut off when steam is not required.

Model	25P			
Sizes	½" to 2"	2½", 3", 4"	½" to 2"	2", 2½", 3", 4"
Connections	NPT	ANSI 125 flanged	NPT	ANSI 300 flanged
Construction	Cast iron		Cast steel	
Options		ANSI 250 flanged		ANSI 150 flanged (excludes 2")
Transmission Tubing	Copper Tubing		Stainless Steel Tubing	



½" to 2"



2" (ANSI 300 only) to 4"

Typical applications

The 25P is a reliable, accurate regulator to reduce steam from a high supply pressure to the most efficient operating pressure of the equipment, and to protect the equipment from dangerously high pressures.

Downstream pressure ranges

For the following downstream pressures, three color-coded pilot valve springs are available:

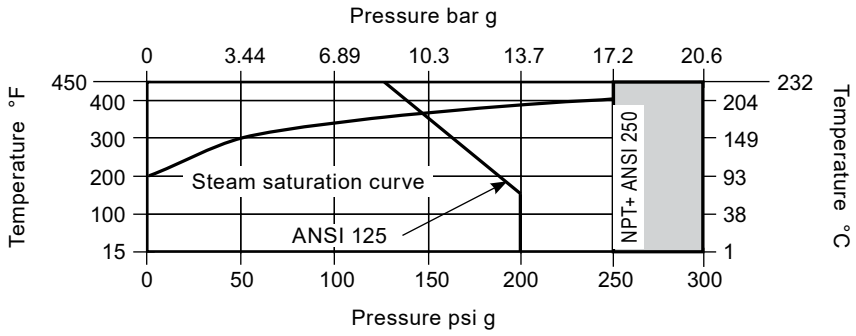
Yellow: 3 to 30 psi (0.21 to 2.1 bar)
Blue: 20 to 100 psi (1.4 to 6.9 bar)
Red: 80 to 250 psi (5.5 to 17.2 bar)

Capacities

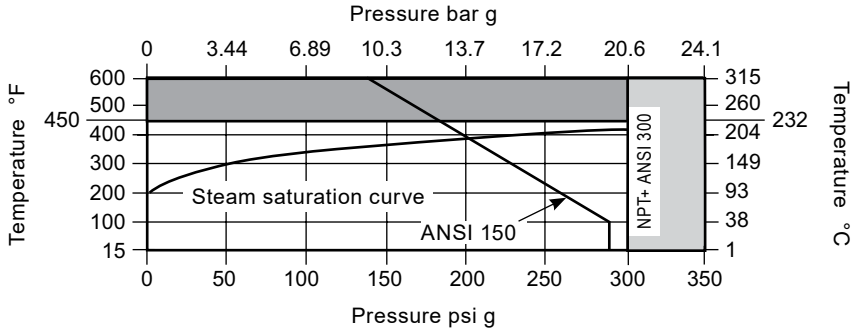
For selection and sizing data, see TI-P717-08-US.

Pressure/temperature limits

Cast iron



Cast steel



The product should not be used in shaded area.

For operation in this region, stainless steel transmission tubing need be fitted.
Note: Maximum temperature for Stainless steel tubing is 600 °F (316 °C)

Sample specification

The pressure regulator shall be of the pilot-actuated diaphragm operated type. The main valve shall be single-seated with hardened stainless steel trim; the regulator body shall be cast iron (cast steel). The pilot shall be bolted directly to the regulator body. The regulator shall be capable of dead-end shut-off.

Installation

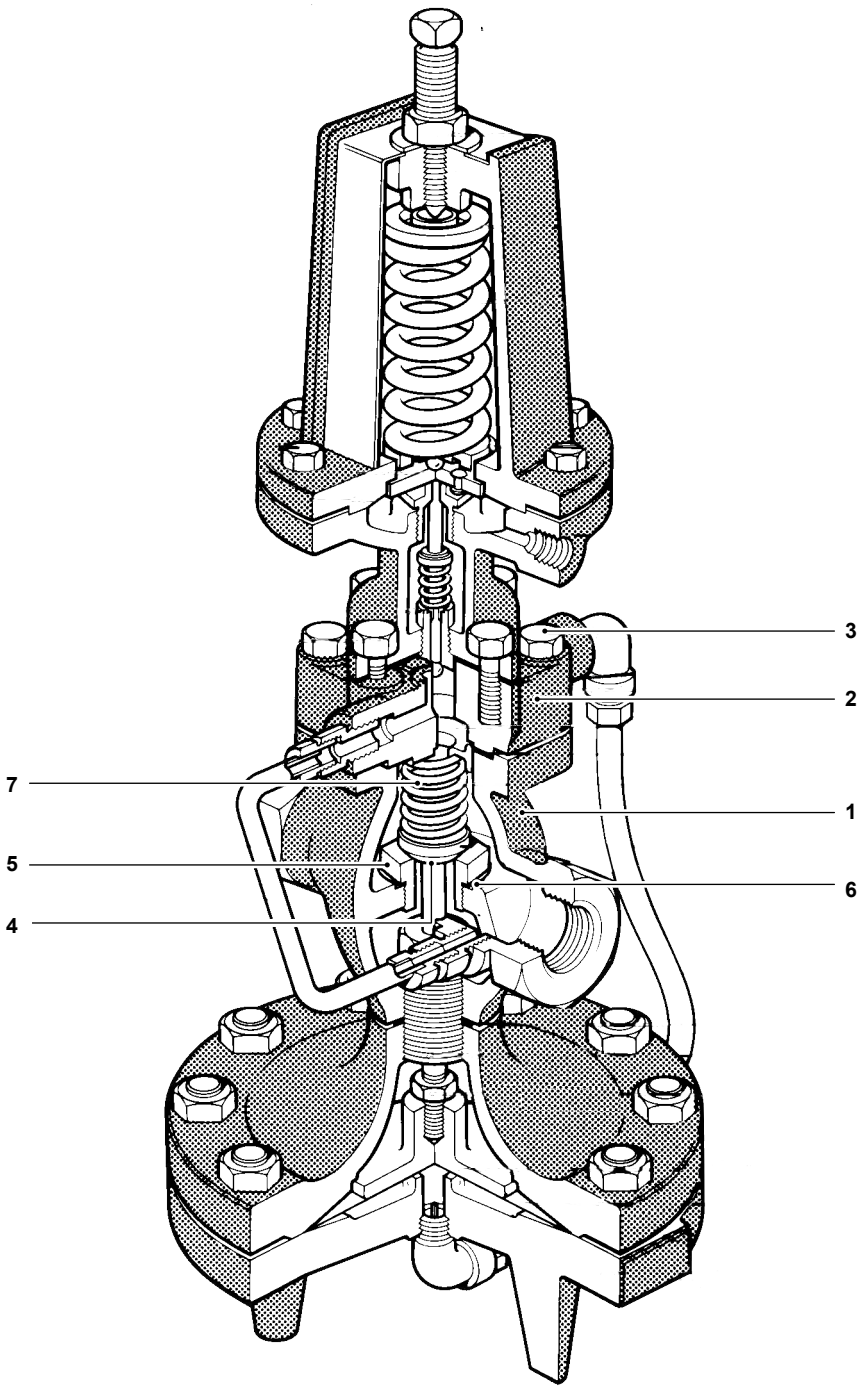
The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The pressure sensing line should be located in a straight section of the downstream piping at least 10 pipe diameters from the nearest fitting. Complete installation instructions are given in IM-P717-06-US.

Maintenance

Complete installation and maintenance instructions are given in IM-P717-06-US, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

Materials

½" to 2"

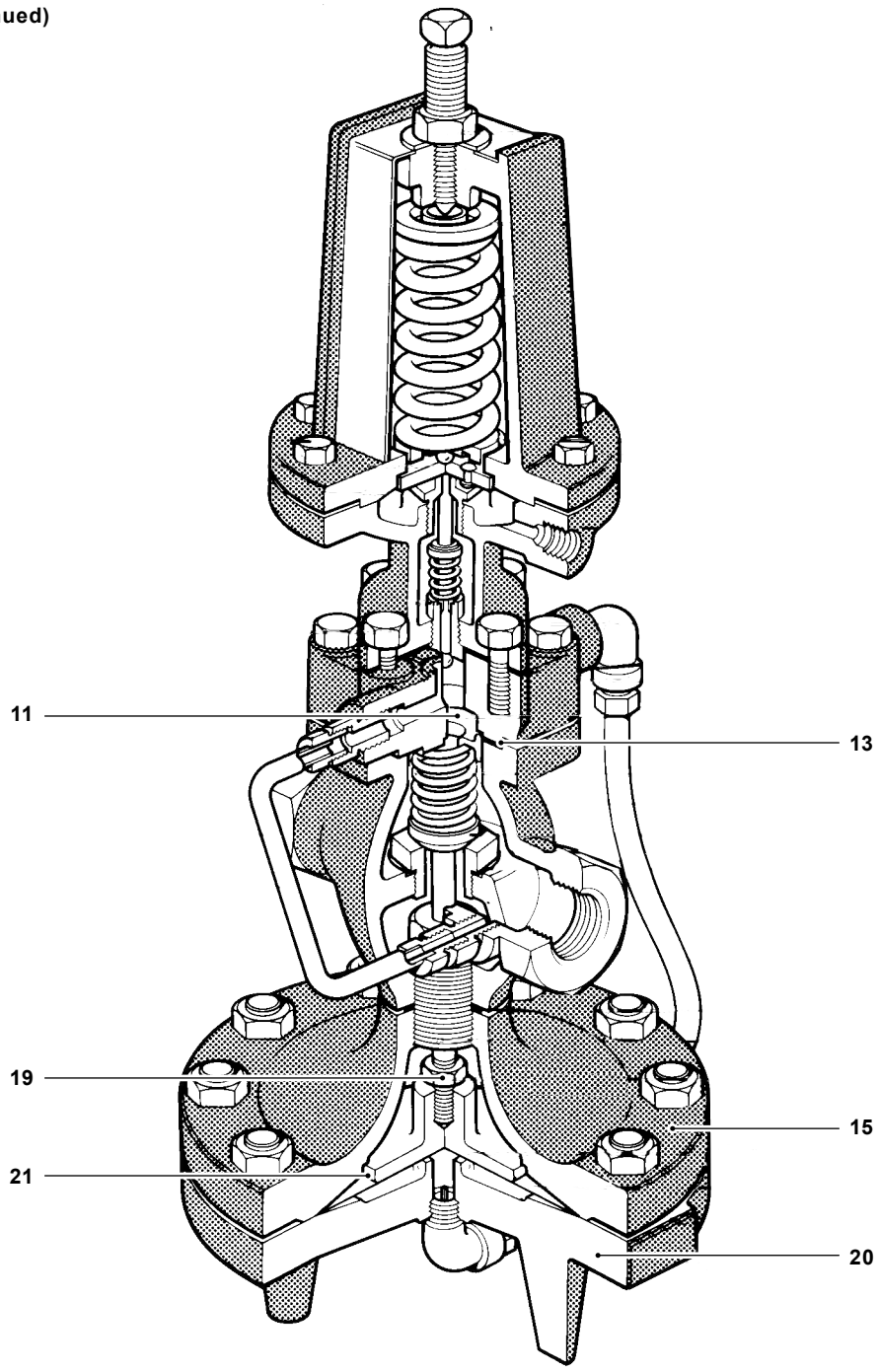


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless steel	

Materials continued on next page

Materials (continued)

½" to 2"

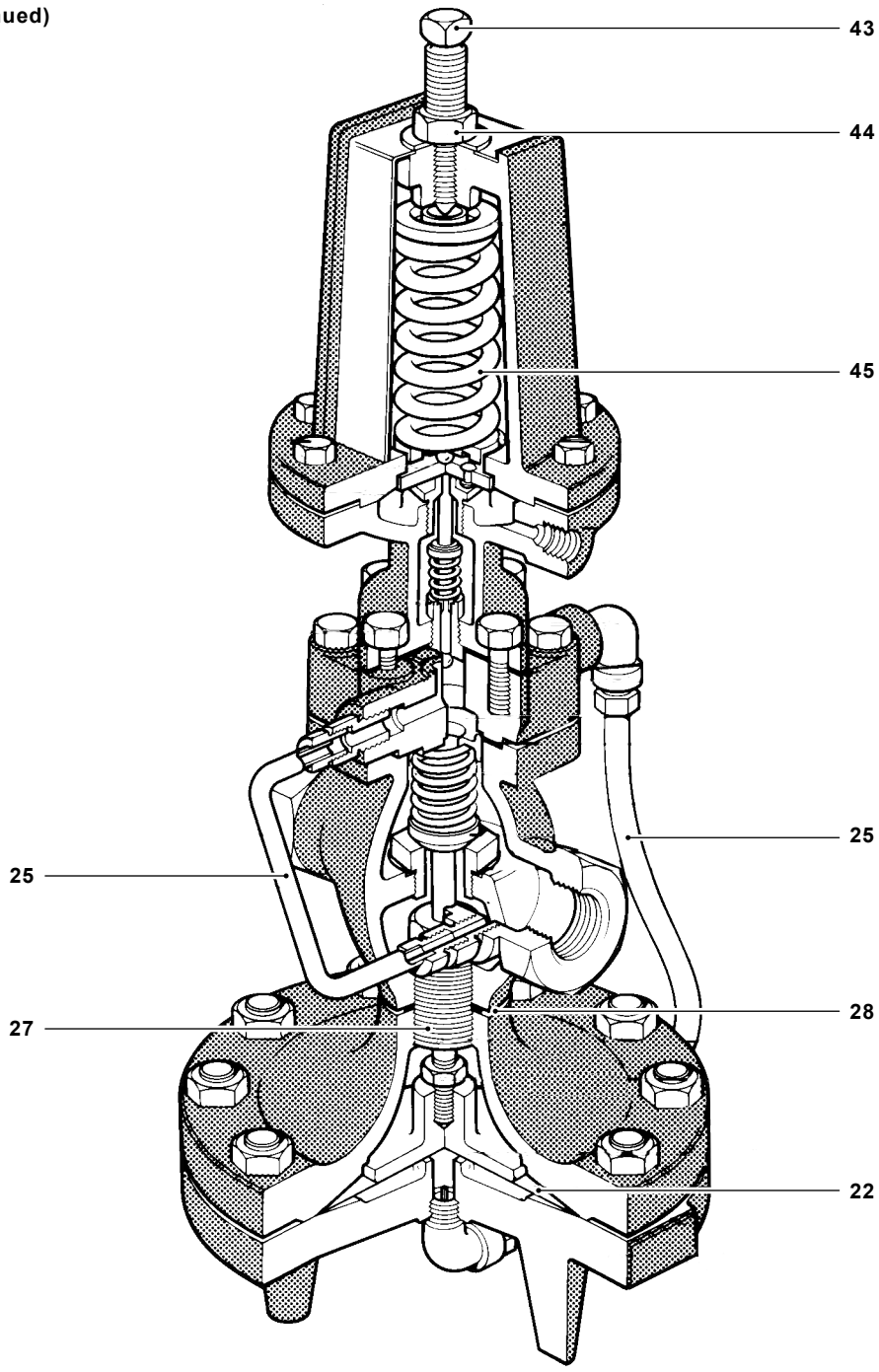


No.	Part	Material	
11	Spring Guide	Cast iron ½"-2" CRS 2"* - 4"	
13	Cover Gasket	Graphite	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
19	Nut	Brass ½" - 2" Steel 2"* - 4"	
20	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Stainless steel ½" - 2" C.I. 2"* - 4"	

Materials continued on next page

Materials (continued)

½" to 2"

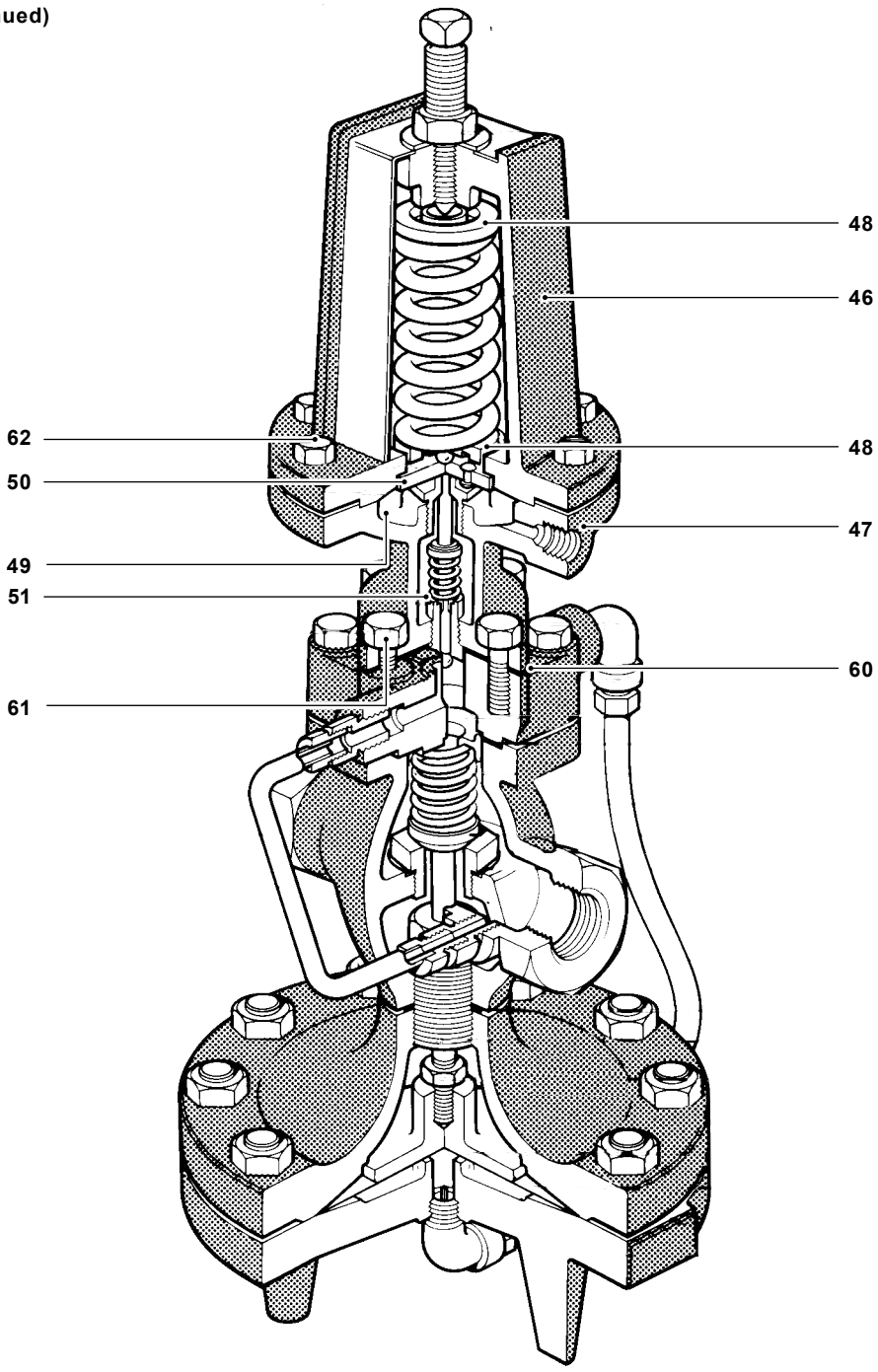


No.	Part	Material
22	Main Diaphragm (2 ply)	Stainless steel
25	Tubing Assembly Cast Iron	Copper / Brass
	Tubing Assembly Cast Steel	Stainless Steel
27	Connector Stud	Stainless steel
28	Body Gasket	½" - 2" Copper Clad 2"* - 4" Graphite
43	Adjustment screw	Stainless steel
44	Jam Nut	Brass
45	Pilot Valve Spring	Steel

Materials continued on next page

Materials (continued)

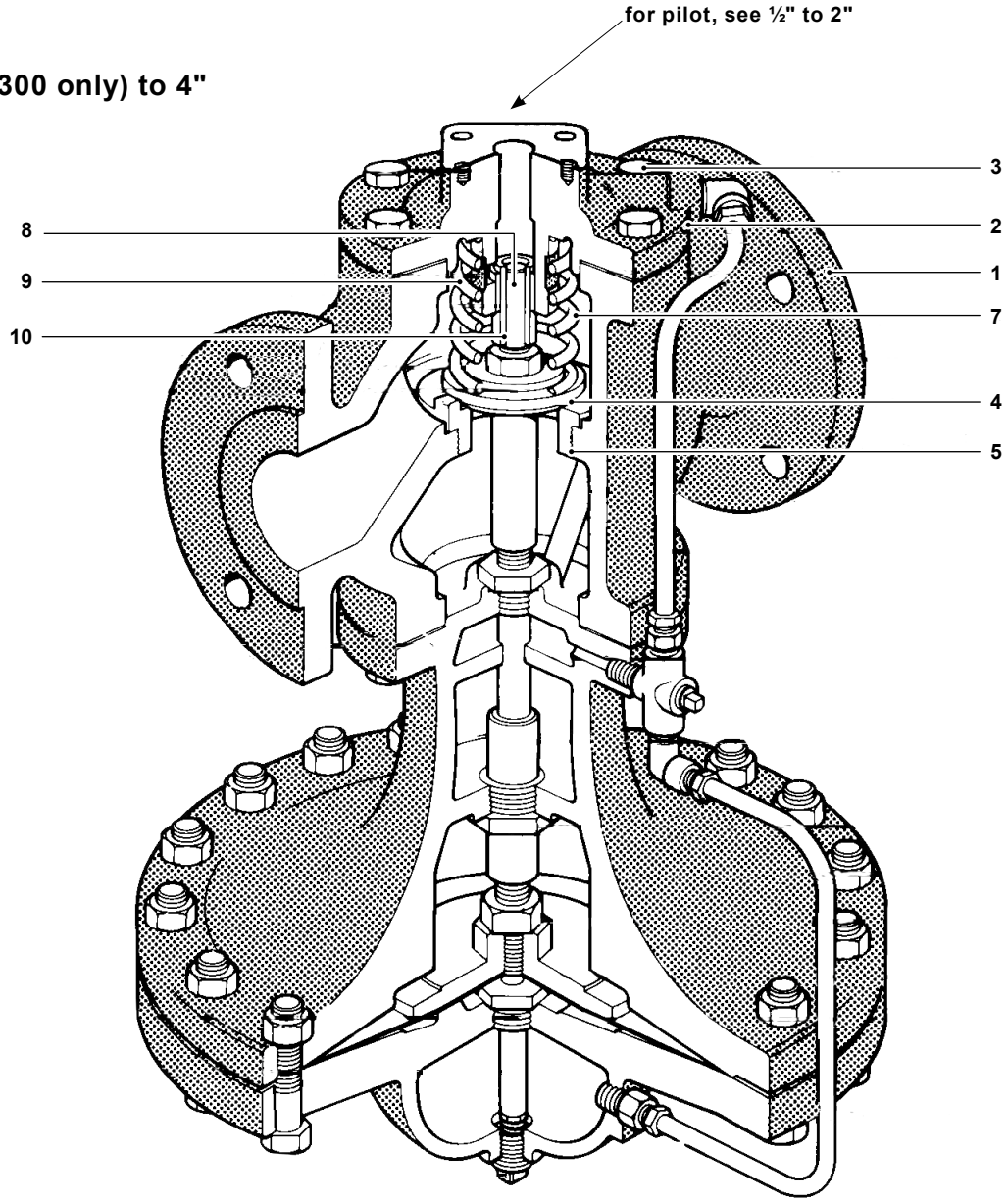
½" to 2"



No.	Part	Material	
46	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
47	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
48	Spring Plate	Steel	
49	Diaphragm (2 ply)	Stainless steel	
51	Pilot Head Spring	Stainless steel	
60	Pilot Gasket	Graphite	
61	Pilot Mounting Screws	Steel	
62	Diaphragm Case Screws	Steel	ASTM A449

Materials

2" (ANSI 300 only) to 4"

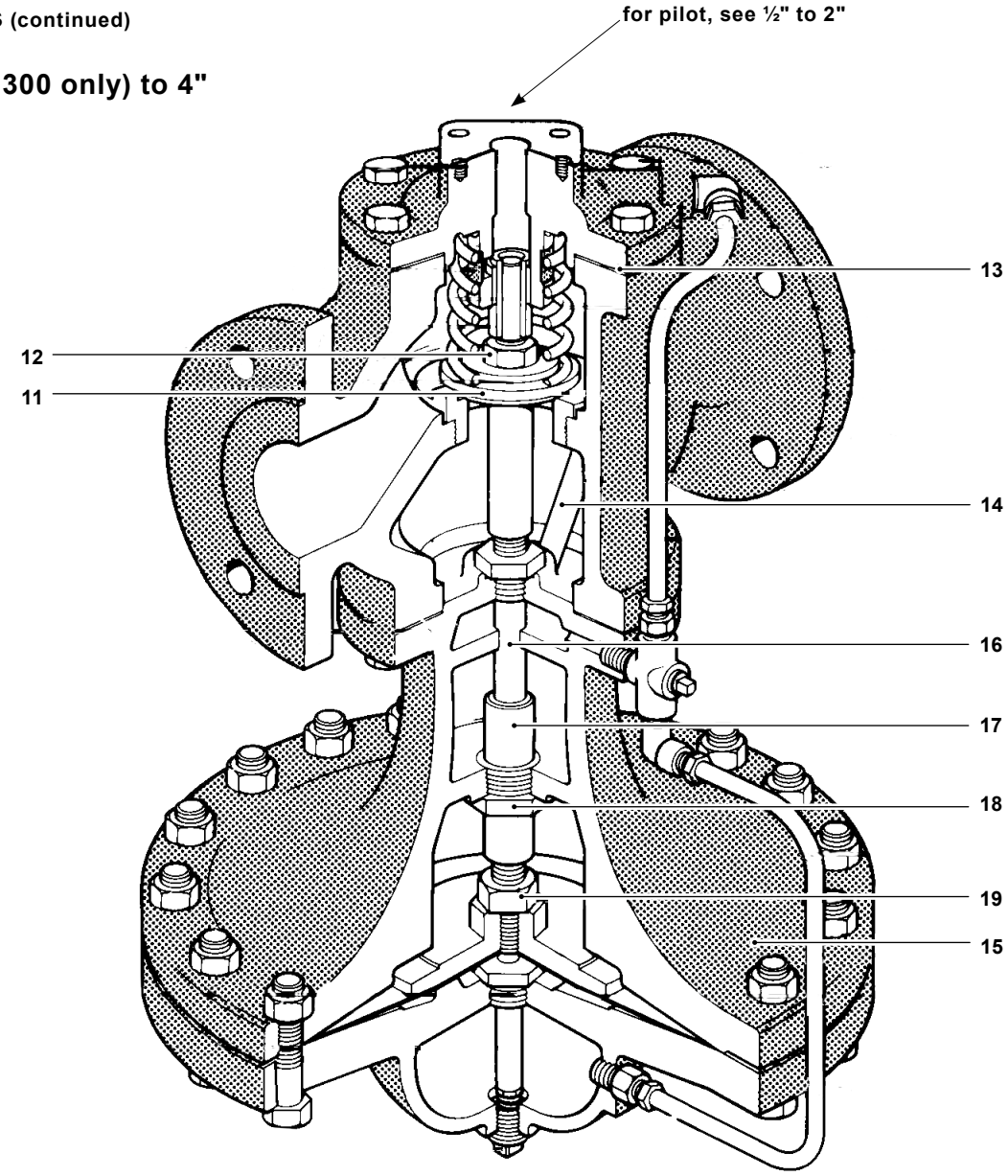


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
7	Valve Return Spring	Stainless steel	
8	Valve Stem	Stainless steel	
9	Strainer Screen	Stainless steel	
10	Valve Stem Sleeve	Stainless steel	

Materials continued on next page

Materials (continued)

2" (ANSI 300 only) to 4"

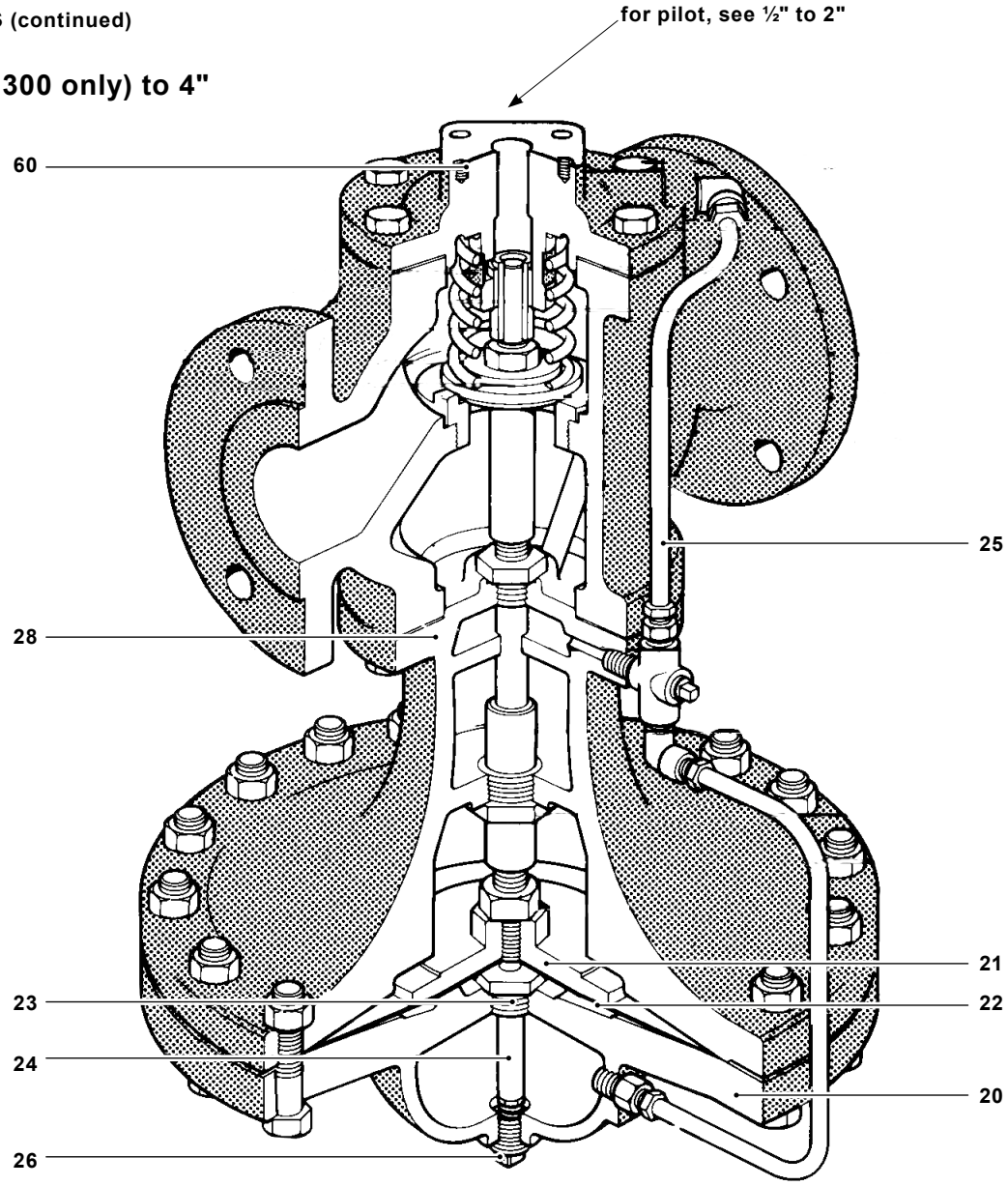


No.	Part	Material	
11	Spring Guide	Cast iron ½"-2" CRS 2"* - 4"	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless steel	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
16	Stem Bushing	Stainless steel (2½" - 4" Cast steel only)	
17	Diaphragm Plate Stem	Stainless steel	
18	Diaphragm Stem Guide	Stainless steel	
19	Nut	Brass ½" - 2" Steel 2"* - 4"	

Materials continued on next page

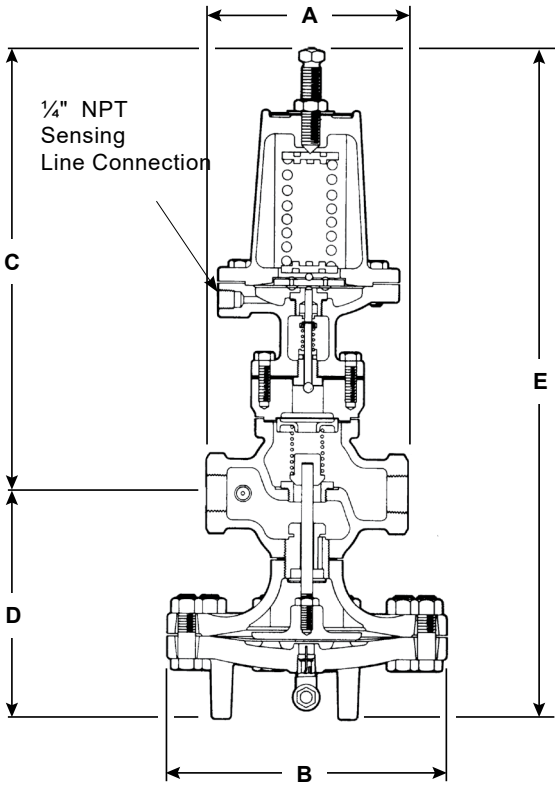
Materials (continued)

2" (ANSI 300 only) to 4"

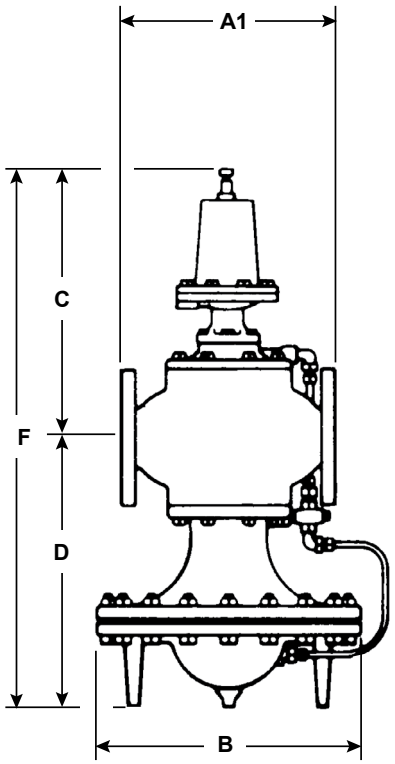


No.	Part		Material	
20	Lower Diaphragm Case		Cast iron	ASTM A 126 CL B
			Cast steel	ASTM A216 Gr WCB
21	Diaphragm Plate		Stainless steel ½" - 2" C.I. 2"* - 4"	
22	Main Diaphragm (2 ply)		Stainless steel	
23	Bushing		CRS	
24	Tube and Orifice		Stainless steel	
25	Tubing Assembly Cast Iron		Copper / Brass	
	Tubing Assembly Cast Steel		Stainless Steel	
26	Plug	(Cast iron)	Brass	
		(Cast steel)	Steel	
28	Body Gasket		½" - 2" Copper Clad 2"* - 4" Graphite	
60	Pilot Gasket		Graphite	

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



½" to 2"



2" (ANSI 300 only) to 4"

Size	A	ANSI 125 ANSI 150 A1	ANSI 250 ANSI 300 A1	B	C	D	E	Weight	
								Cast Iron	Cast Steel
½", ¾"	5.5 (140)			7.6 (193)	12.2 (310)	6.2 (157)	18.4 (467)	32 (14.5)	35 (15.9)
1"	6.0 (152)			8.6 (218)	12.1 (307)	6.75 (171)	18.9 (480)	39 (17.7)	43 (19.5)
1¼", 1½"	7.25 (184)			8.6 (218)	12.7 (323)	7.1 (80)	19.75 (502)	44 (20)	48 (21.8)
2"	8.5 (216)		9.0 (229)	10.6 (269)	13.3 (338)	8.2 (208)	21.5 (546)	69 (31.3)	75 (34)
2½"		10.9 (277)	11.5 (292)	13.6 (345)	14.0 (356)	13.9 (353)	27.9 (709)	157 (71.2)	171 (77.6)
3"		11.75 (298)	12.5 (318)	13.6 (345)	13.9 (353)	14.4 (366)	28.4 (721)	188 (85.3)	205 (93)
4"		13.9 (353)	14.5 (368)	15.6 (396)	15.25 (387)	16.1 (409)	31.4 (798)	284 (129)	309 (140)

Standard Transmission tubing for Cast Iron Valve will be Copper with Brass fittings.

Standard Transmission tubing for Cast Steel Valve will be Stainless Steel.

If a different material is required order the Spare Part Kit

Stainless Steel Transmission Tubing Kits

Item #	Size	Description
71464	½", ¾"	Kit, ½"-¾", 25 Valve, Stainless Steel, Transmission tubing
71465	1"	Kit, 1", 25 Valve, Stainless Steel, Transmission tubing
71466	1¼", 1½"	Kit, 1¼"-1½", 25 Valve, Stainless Steel, Transmission tubing
71467	2"	Kit, 2", 25 Valve, Stainless Steel, Transmission tubing
71468	2½"	Kit, 2½", 25 Valve, Stainless Steel, Transmission tubing
71469	3"	Kit, 3", 25 Valve, Stainless Steel, Transmission tubing
71470	4"	Kit, 4", 25 Valve, Stainless Steel, Transmission tubing

Copper Tubing Transmission Line Kits

Item #	Size	Description
57302	½", ¾"	Transmission tubing kit, ½"-¾", 25 Valve
57303	1"	Transmission tubing kit, 1", 25 Valve
57304	1¼", 1½"	Transmission tubing kit, 1¼"-1½", 25 Valve
57305	2"	Transmission tubing kit, 2", 25 Valve
58010	2½"	Transmission tubing kit, 2½", 25 Valve
58011	3"	Transmission tubing kit, 3", 25 Valve
58012	4"	Transmission tubing kit, 4", 25 Valve

TI-S39-02-US
Issue 1

Pilot Operated Pressure Regulator 6" 25P

Description

The 25P is a self-actuated pilot-operated pressure regulator. Downstream pressure is fed back through an external sensing line to the pressure pilot, which adjusts the opening of the main valve so as to maintain the set pressure. The valve meets Class IV shut-off specifications but is not suitable for dead-end service.

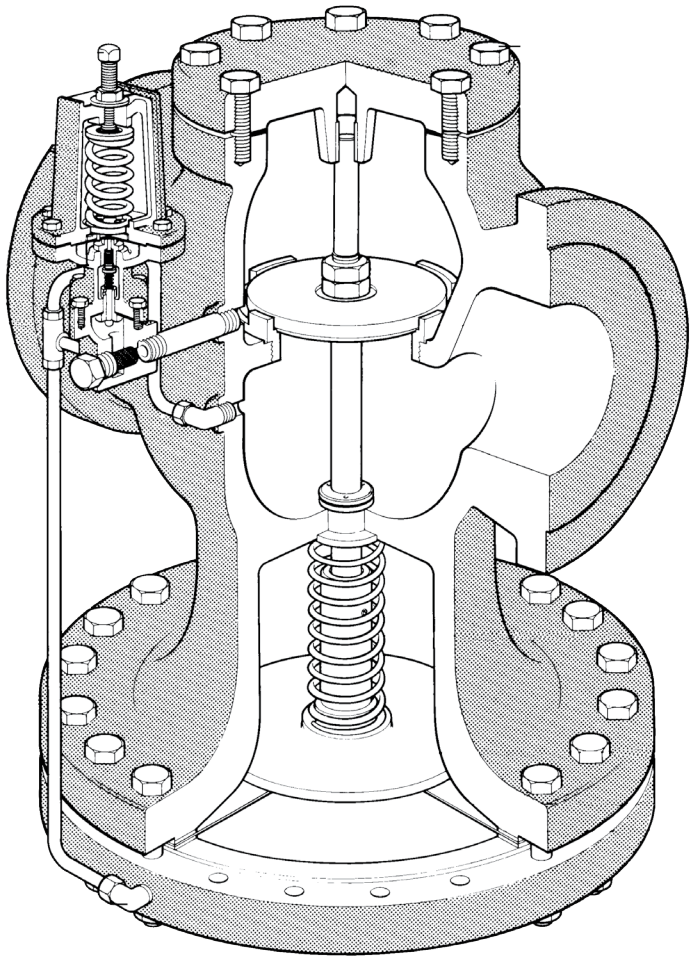
Model	25P	
Sizes	6"	
Connections	ANSI 125, 250	ANSI 150, 300
Construction	Cast iron	Cast steel
Options	Reduce orifice designated by "S"	

Typical applications

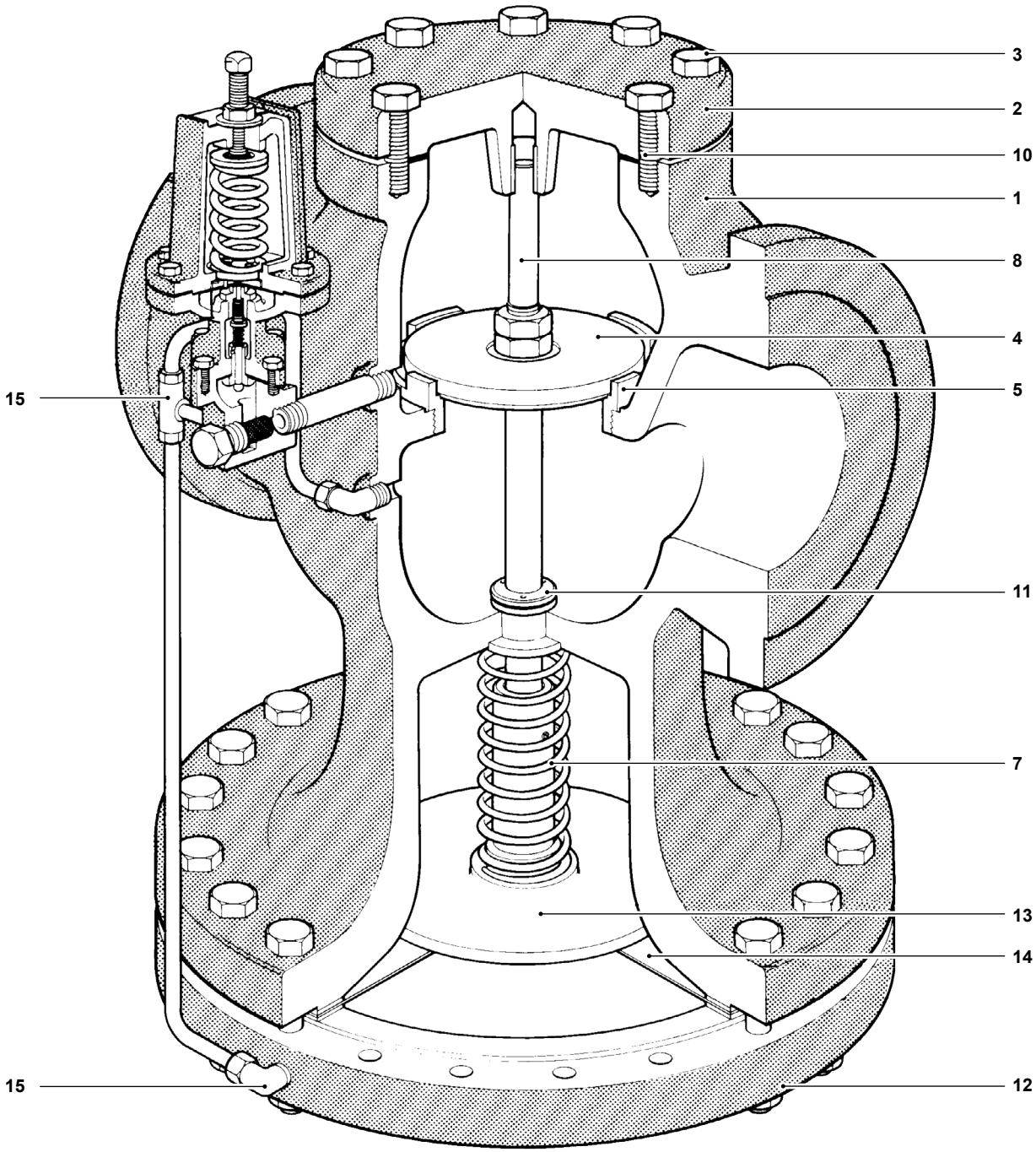
The 25P is a reliable, accurate regulator to reduce steam from a high supply pressure to the most efficient operating pressure of the equipment, and to protect the equipment from dangerously high pressures.

Capacities

For selection and sizing data, see TI-P717-08-US



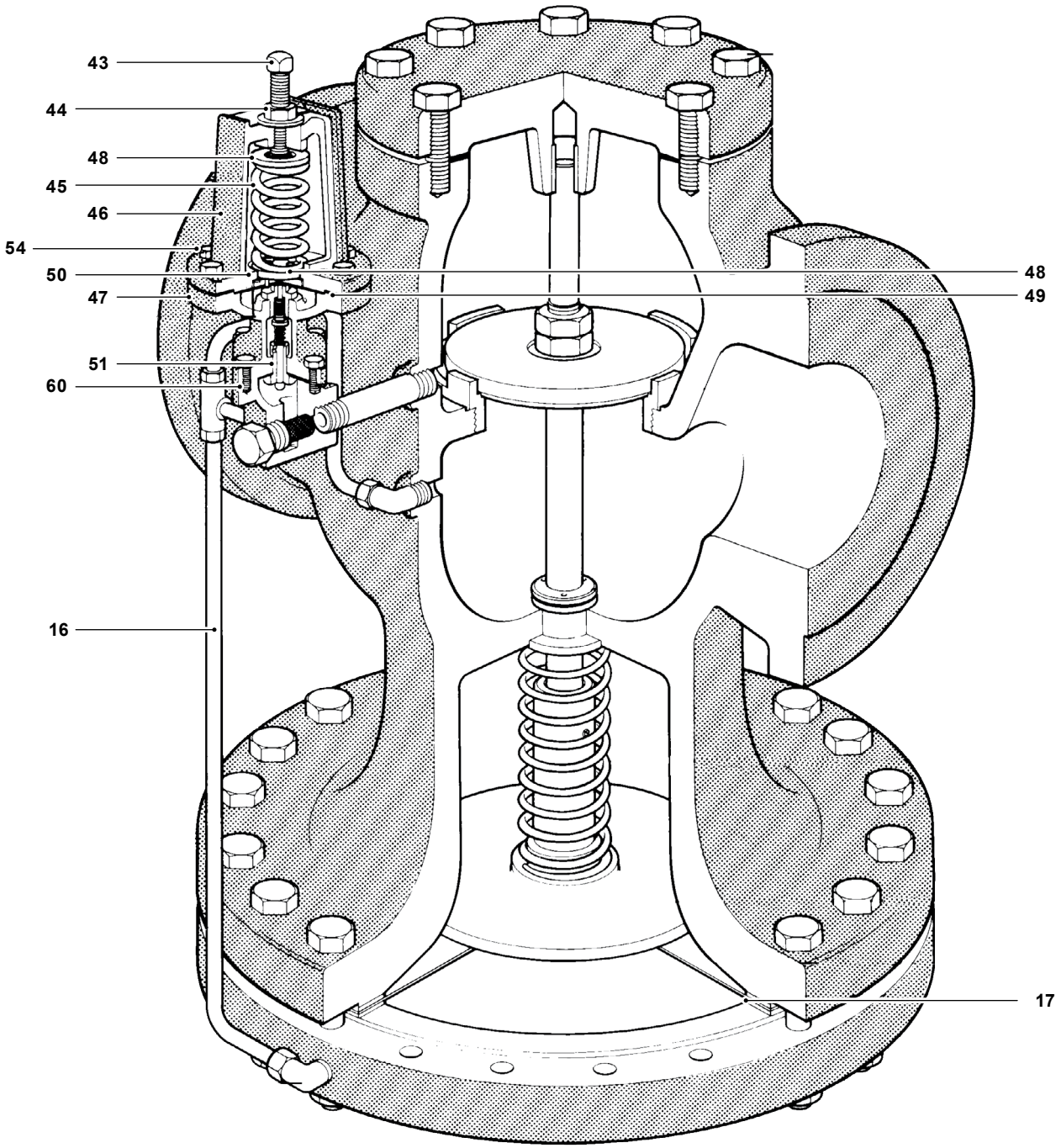
Materials



No.	Part	Material	
1	Valve body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
3	Cover bolts	Steel	AISI 1038
4	Main valve head	Stainless steel	ASTM A 743 CA 40
5	Main valve seat	Stainless steel	ASTM A 743 CA 40
7	Valve return spring	Stainless steel	AISI 302

No.	Part	Material	
8	Valve stem	Stainless steel	AISI 304
10	Cover gasket	Graphite	BS 2815 A
11	Stem bushing	Brass	ASTM B16
12	Lower diaphragm case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
13	Diaphragm plate	Stainless steel	ASTM A 743 CA 40
14	Main diaphragm (2 ply)	Stainless steel	AISI 301
15	Tube and orifice	Brass	ASTM B16

Materials (continued)

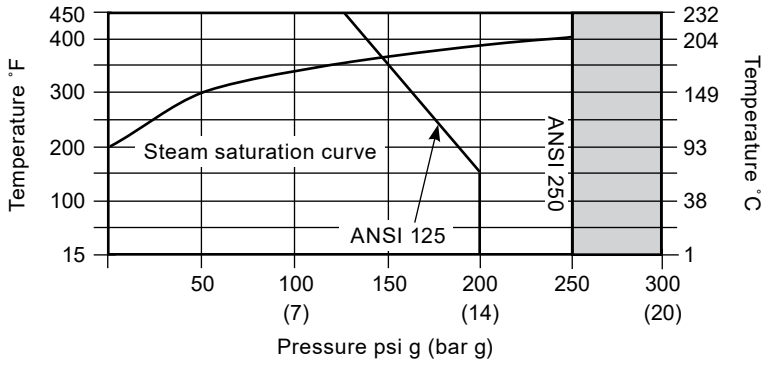


No.	Part	Material	
16	Tubing assembly	Copper	ASTM B280 (122)
17	Diaphragm gasket (2)	Graphite	BS 2815 A
43	Adjustment screw	Stainless steel	AISI 304
44	Jam nut	Brass	ASTM B16
45	Pilot valve Spring	Steel	AISI 1060
46	Upper diaphragm case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
47	Lower diaphragm case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B

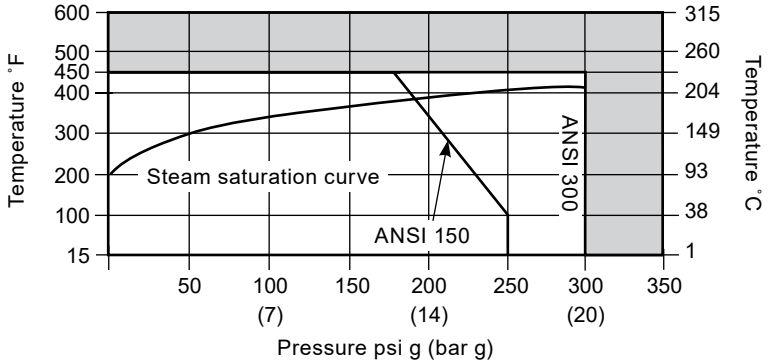
No.	Part	Material	
48	Spring plate	Steel	ASTM A569
49	Diaphragm	Stainless steel	ASTM A240
50	Diaphragm plate	Brass	ASTM B36
51	Head and seat assembly	Stainless steel	AISI 440
		Stainless steel	AISI 440F
54	Diaphragm case screws	Steel 5/16" - 18 x 1"	ASTM A449
60	Pilot gasket	Graphite	

Pressure/temperature limits

Cast Iron



Cast Steel



The product **must not** be used in this region.

Note: Maximum temperature for Stainless Steel tubing is 600 °F (316 °C)

Downstream Pressure Ranges

For the following downstream pressures, three color-coded pilot valve springs are available:

Yellow	Blue	Red
3 to 30 psi (0.21 to 2.1 bar)	20 to 100 psi (1.4 to 6.9 bar)	80 to 250 psi (5.5 to 17.2 bar)

Cv values

Size	6" (DN150)	6" "S" (DN150 "S")
Cv value	280	156

Installation

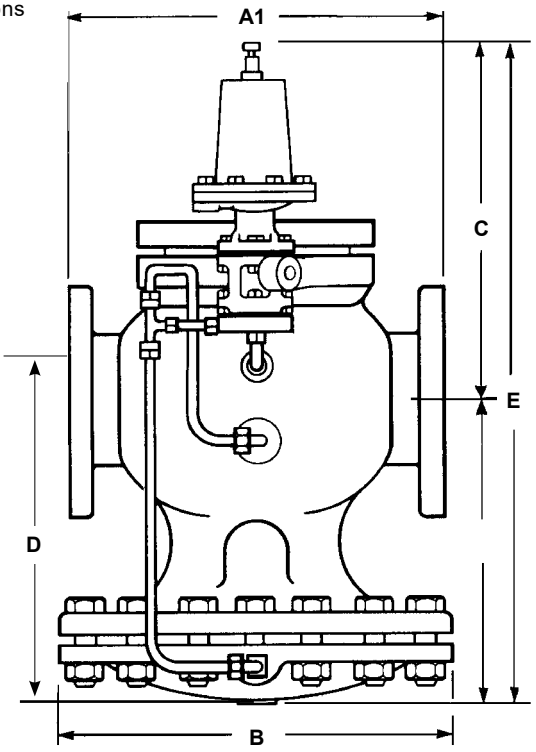
The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer separator set. The pressure sensing line should be located in a straight section of the downstream piping at least 10 pipe diameters from the nearest fitting. Complete installation instructions are given in IM-3-000-US.

Maintenance

Complete maintenance instructions are given in IM-3-000-US and ADVP 3029, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P335-11-US.

Dimensions/weights (approximate) in inches (mm) and lbs (kg)

¼" NPT sensing line connections



Size	ANSI 125/150 A1	ANSI 250/300 A1	B	C	D	E	Weight
6" (DN150)	18.1 (460)	18.9 (480)	19.75 (502)	14.9 (378)	17.1 (434)	32.1 (815)	595 lb (270 kg)

Sample specification

The pressure regulator shall be of the pilot-actuated diaphragm operated type. The main valve shall be single-seated with hardened stainless steel trim; the regulator body shall be cast iron. The pilot shall be externally mounted to the regulator body.

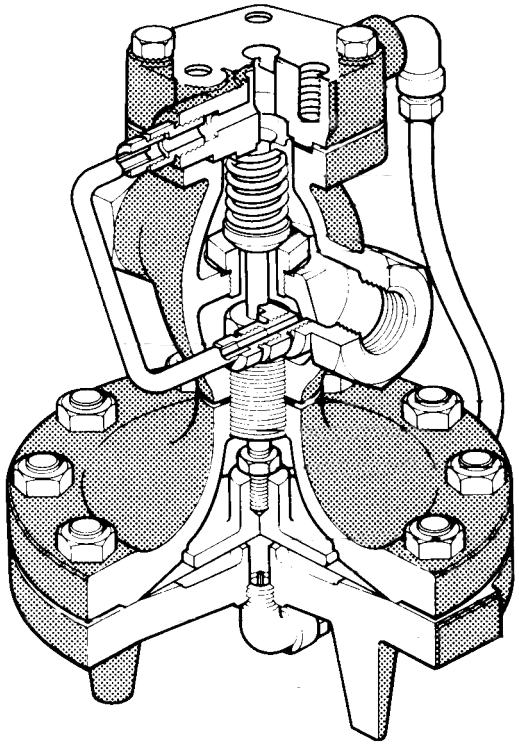
TI-P235-19-US
Issue 2

Pressure Regulator with Air Loaded Pilot
½" to 4" 25PA

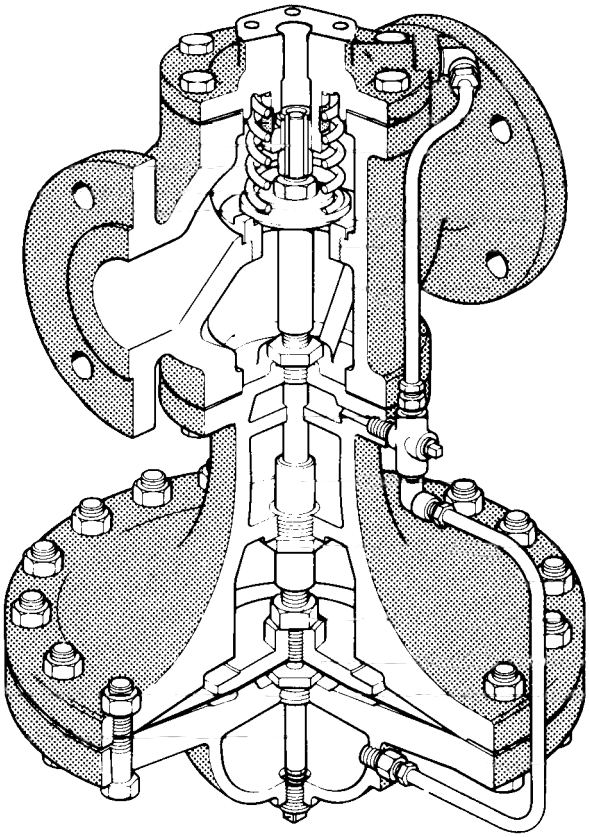
Description

The Pressure Pilot is loaded by an external compressed air supply rather than by a spring. The downstream pressure can be set remotely by adjusting the loading air pressure.

Model	25PA			
Sizes	½" to 2" (DN15 to DN50)	2½", 3", 4" (DN65, DN80, DN100)	½" to 2" (DN15 to DN50)	2", 2½", 3", 4" (DN50, DN65, DN80, DN100)
Connections	NPT	ANSI 125	NPT	ANSI 300
Construction	Cast Iron		Cast Steel	
Options		ANSI 250		ANSI 150 (excludes 2")
Transmission Tubing	Copper Tubing		Stainless Steel Tubing	



½" to 2"
(DN15 to DN50)



2"* to 4"
(DN50* to DN100)
***ANSI 300 only**

Air Pilots
PA direct air load maximum 120 psi g (8.3 bar g) air

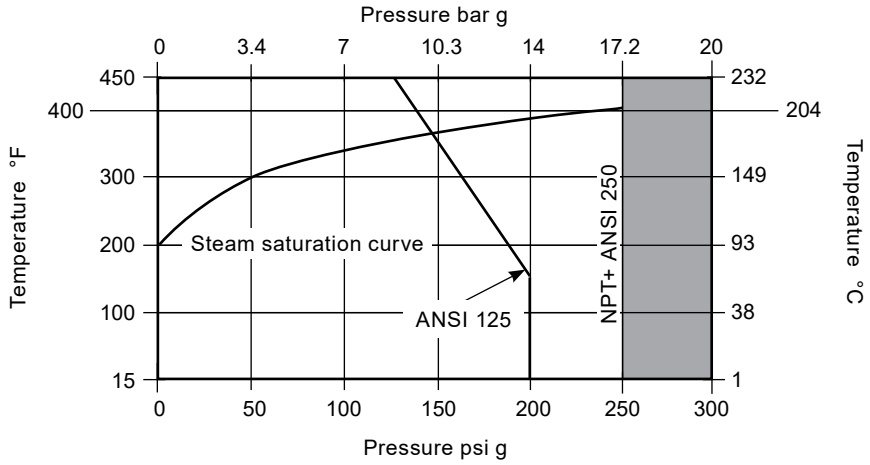
Downstream pressure ranges
For proper selection, see TI-P717-08-US

PA	3 to 100 psi g	(approximate ratio 1:1), see table

Capacities
For selection and sizing data, see TI-P717-08-US

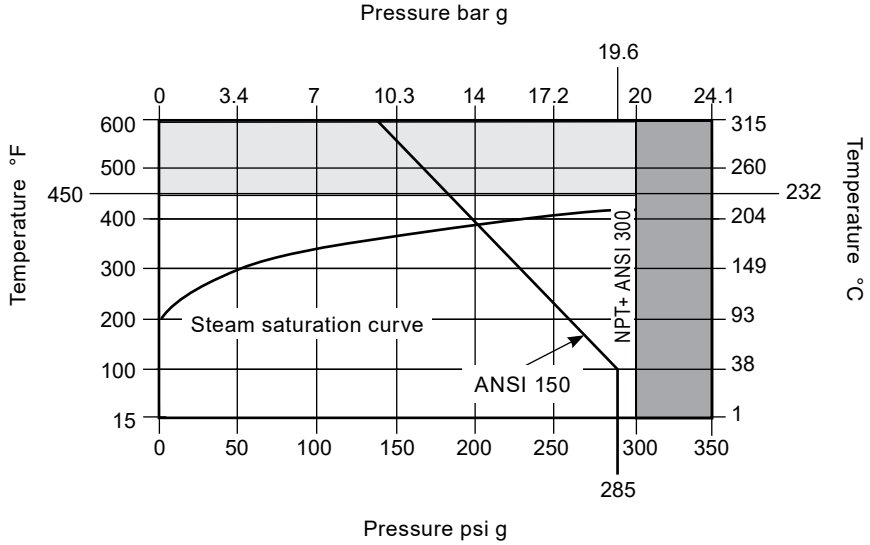
Pressure/temperature limits

Cast Iron



The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Cast Steel

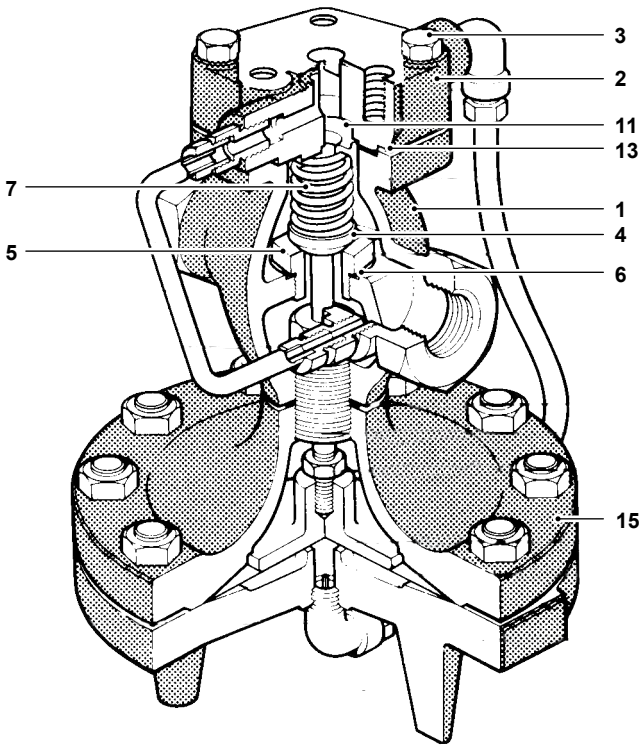


For operation in this region, stainless steel transmission tubing need be fitted.

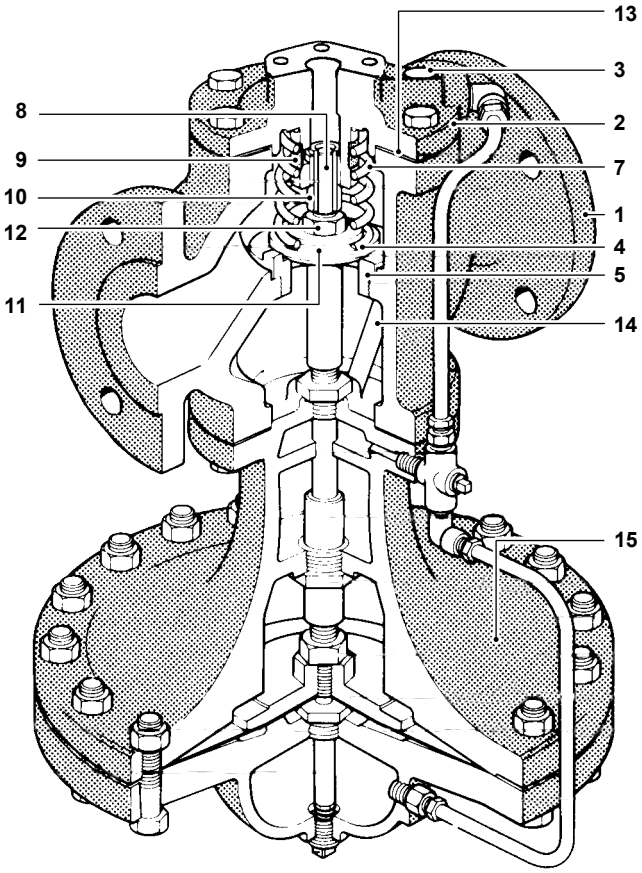
The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Note: Maximum temperature for Stainless Steel tubing is 600 °F (316 °C)

Materials



½" to 2"
(DN15 to DN50)

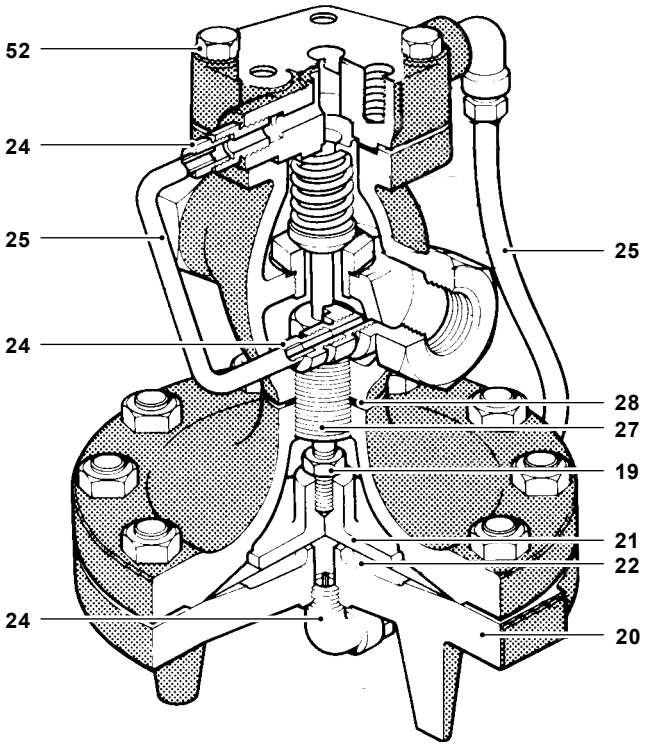


2"* to 4"
(DN50* to DN100)
*ANSI 300 only

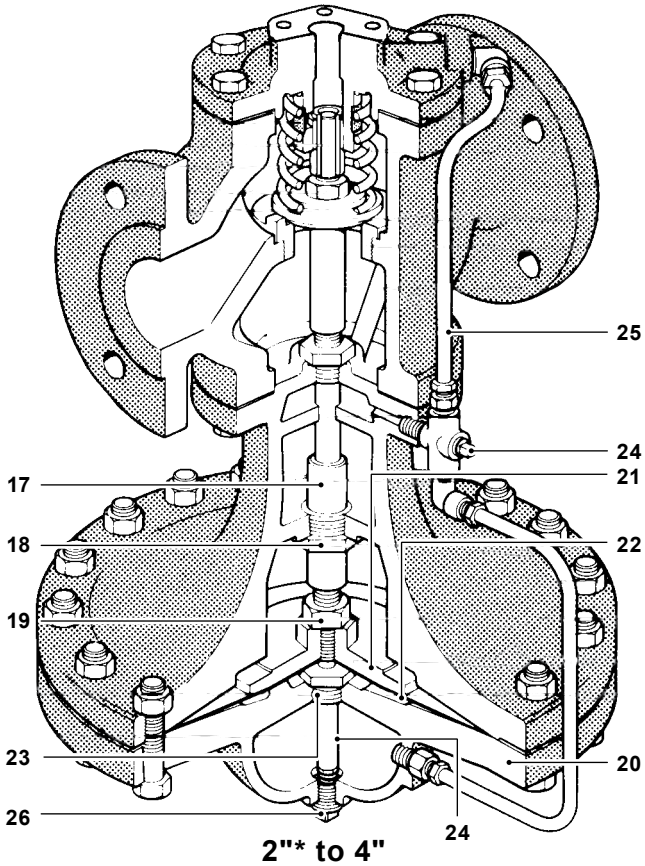
No.	Part	Material	
1	Valve Body	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
2	Cover	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless Steel	
5	Main Valve Seat	Stainless Steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless Steel	
8	Valve Stem	Stainless Steel	
9	Strainer Screen	Stainless Steel	
10	Valve Stem Sleeve	Stainless Steel	
11	Spring Guide	Cast Iron ½" - 2" (DN15 - DN50)	
		CRS 2"* - 4" (DN50* - DN100)	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless Steel	
15	Upper Diaphragm Case	Cast Iron	ASTM A 126 CL B

Materials continued on next page

Materials (continued)



½" to 2"
(DN15 to DN50)

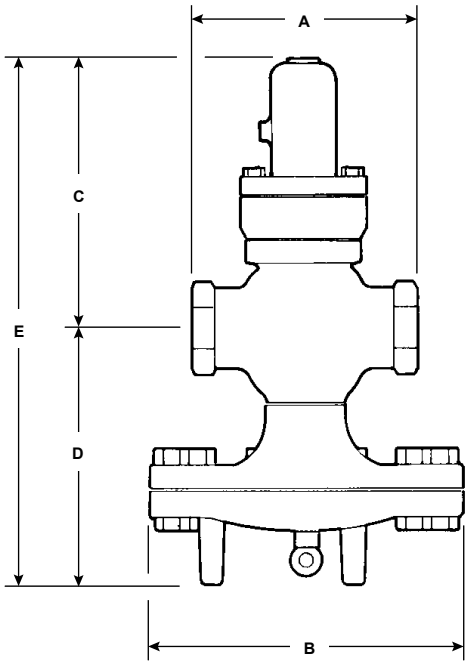


2"* to 4"
(DN50* to DN100)
*ANSI 300 only

No.	Part		Material	
16	Stem Bushing (2-½" - 4" Cast Steel only)		Stainless Steel	
17	Diaphragm Plate Stem		Stainless Steel	
18	Diaphragm Stem Guide		Stainless Steel	
19	Nut		Brass ½" - 2" (DN15 - DN50)	
			Steel 2"* - 4" (DN50* - DN100)	
20	Lower Diaphragm Case		Cast Iron	ASTM A 126 CL B
			Cast Steel	ASTM A216 Gr WCB
21	Diaphragm Plate		Brass ½" - 2" (DN15 - DN50)	
			C.I. 2"* - 4" (DN50* - DN100)	
22	Main Diaphragm (2 ply)		Stainless Steel	
23	Bushing		CRS	
24	Tube and Orifice		Stainless Steel	
25	Tubing Assembly Cast Iron		Copper / Brass	
	Tubing Assembly Cast Steel		Stainless Steel	
26	Plug	(Cast Iron)	Brass	
		(Cast Steel)	Steel	
27	Connector Stud		Stainless Steel	
28	Body Gasket		½" - 2" (DN15 - DN50) Copper Clad	

Dimensions/weights (approximate) in inches (mm) and lbs (kg)

25PA
½" to 2"
(DN15 to DN50)



		ANSI 125 ANSI 150	ANSI 250 ANSI 300		ANSI 125	ANSI 250 ANSI 300		ANSI 125	ANSI 250 ANSI 300	Weight	
Size	**A**	**A1**	**A1**	**B**	**C**	**C1**	**D**	**E**	**E1**	**Cast iron**	**Cast steel**
½", ¾"	5.5 (140)			7.6 (193)	10.1 (257)	8.0 (203)	6.2 (157)	16.3 (414)	14.2 (361)	32 (14.5)	35 (15.9)
1"	6.0 (152)			8.6 (218)			6.75 (171)	16.9 (429)	14.8 (376)	39 (17.7)	43 (19.5)
1¼", 1½"	7.25 (184)						7.1 (180)	17.7 (450)	15.6 (396)	44 (20.0)	48 (21.8)
2"	8.5 (216)		9.0 (229)	10.6 (269)	11.3 (287)	9.2 (234)	8.2 (208)	19.5 (495)	17.4 (442)	69 (31.3)	75 (34.0)
2½"		10.9 (277)	11.5 (292)	13.6 (345)	11.9 (302)	9.9 (251)	13.9 (353)	25.8 (655)	23.8 (605)	157 (71.2)	171 (77.6)
3"		10.75 (273)	12.5 (318)			9.8 (249)	14.4 (366)	26.3 (668)	24.3 (617)	188 (85.3)	205 (93.0)
4"		13.9 (353)	14.5 (368)	15.6 (396)	13.2 (335)	11.1 (282)	16.1 (409)	29.3 (744)	27.3 (693)	284 (129)	309 (140)

* All pilots are interchangeable. Drawings are for dimensional purposes only.

Air Loading Pilot PA Requires Air Loading
as indicated in the following table

Desired Outlet Steam Pressure P2 psi g (bar g)	5 (0.34)	10 (0.69)	25 (1.7)	50 (3.4)	75 (5.2)	100 (6.9)
Inlet Pressure P1 psi g (bar g)	10 to 100 (0.69 to 6.9)					
Approximate Air Set Pressure psi g (bar g)	11 to 13.5 (0.76 to 0.93)	16 to 16.8 (1.1 to 1.2)	31 to 33.5 (2.1 to 2.3)	56 to 58 (3.9 to 4)	80 to 81 (5.5 to 5.6)	102 to 103 (7 to 7.1)

Installation
The valve should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the valve. The trap and regulator should both be protected with a strainer. The pressure sensing line should be located either in the downstream piping, or in the steam space.
Complete installation instructions are given in IM-3-000-US.

Maintenance
Complete installation and maintenance instructions are given in IM-3-000-US, a copy of which is supplied with each valve. Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

Standard Transmission tubing for Cast Iron Valve will be Copper with Brass fittings.

Standard Transmission tubing for Cast Steel Valve will be Stainless Steel.

If a different material is required order the Spare Part Kit

Stainless Steel Transmission Tubing Kits

Item #	Size	Description
71464	½", ¾"	Kit, ½"-¾", 25 Valve, Stainless Steel, Transmission tubing
71465	1"	Kit, 1", 25 Valve, Stainless Steel, Transmission tubing
71466	1¼", 1½"	Kit, 1¼"-1½", 25 Valve, Stainless Steel, Transmission tubing
71467	2"	Kit, 2", 25 Valve, Stainless Steel, Transmission tubing
71468	2½"	Kit, 2½", 25 Valve, Stainless Steel, Transmission tubing
71469	3"	Kit, 3", 25 Valve, Stainless Steel, Transmission tubing
71470	4"	Kit, 4", 25 Valve, Stainless Steel, Transmission tubing

Copper Tubing Transmission Line Kits

Item #	Size	Description
57302	½", ¾"	Transmission tubing kit, ½"-¾", 25 Valve
57303	1"	Transmission tubing kit, 1", 25 Valve
57304	1¼", 1½"	Transmission tubing kit, 1¼"-1½", 25 Valve
57305	2"	Transmission tubing kit, 2", 25 Valve
58010	2½"	Transmission tubing kit, 2½", 25 Valve
58011	3"	Transmission tubing kit, 3", 25 Valve
58012	4"	Transmission tubing kit, 4", 25 Valve

TI-S39-03-US
Issue 1

Pilot Operated Pressure Regulator with Electric Override ½" to 4" 25PE

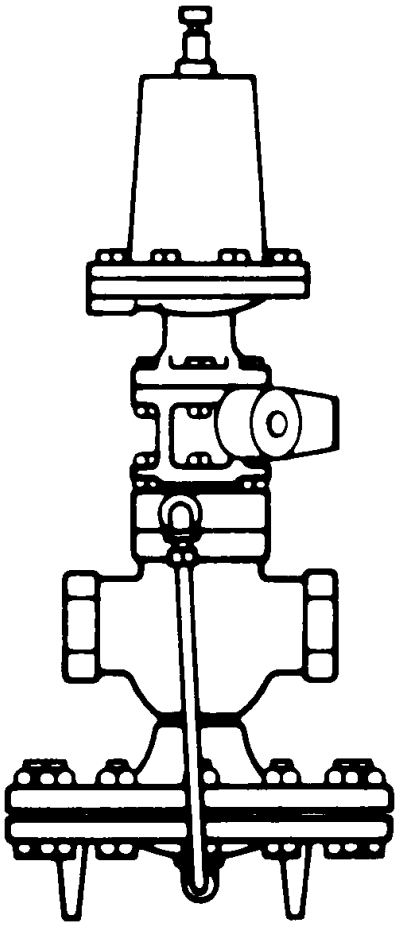
Description

The 25PE has all of the features of the 25P, with the addition of an electric pilot. An electrical signal can override the pressure pilot to provide a remote shut-off capability.
*Note: For pressures below 15 psi g, the E pilot is not recommended for use with valves 2½" and larger.

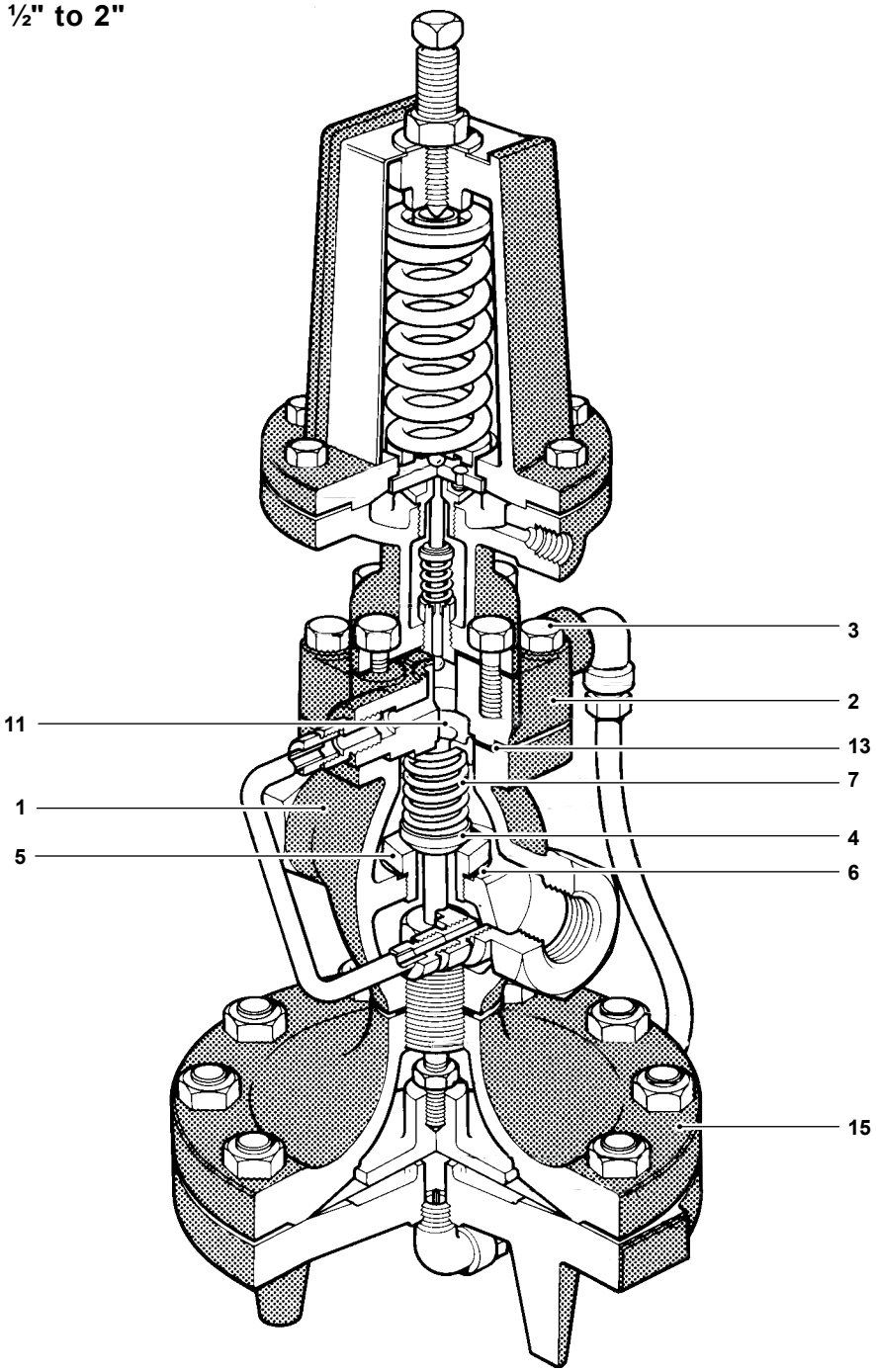
Sizes	**½" to 2"**	**2½", 3", 4"**	**½" to 2"**	**2", 2½", 3", 4"**
Connections	NPT	ANSI 125	NPT	ANSI 300
Construction	Cast iron		Cast steel	
Options		ANSI 250		ANSI 150 (excludes 2")
Electric pilot specifications	Enclosure: NEMA 4 and 7 (C and D) 115v (230v)/60Hz Inrush: 45 VA Normally closed 200 psi g Max. operating pressure			
Electric pilot options	For regulators 2½" and larger at pressures below 125 psi g, use the following electric pilot: Enclosure: NEMA 4 and 7 (C and D) 115v (230v)/60Hz Inrush: 45 VA Normally closed 140 psi g Max. operating pressure (for faster response time) 230 Volt Coil			

Limiting operating conditions

PMO Maximum operating pressure	NPT:	200 psi g (14 bar g) @ 392 °F (200 °C)
	ANSI 125:	125 psi g (8 bar g) @ 392 °F (200 °C)
	ANSI 250:	200 psi g (14 bar g) @ 392 °F (200 °C)
	ANSI 150:	185 psi g (12 bar g) @ 392 °F (200 °C)
	ANSI 300:	200 psi g (14 bar g) @ 392 °F (200 °C)
Maximum operating temperature		392 °F (200 °C)



Materials - 25P ½" to 2"



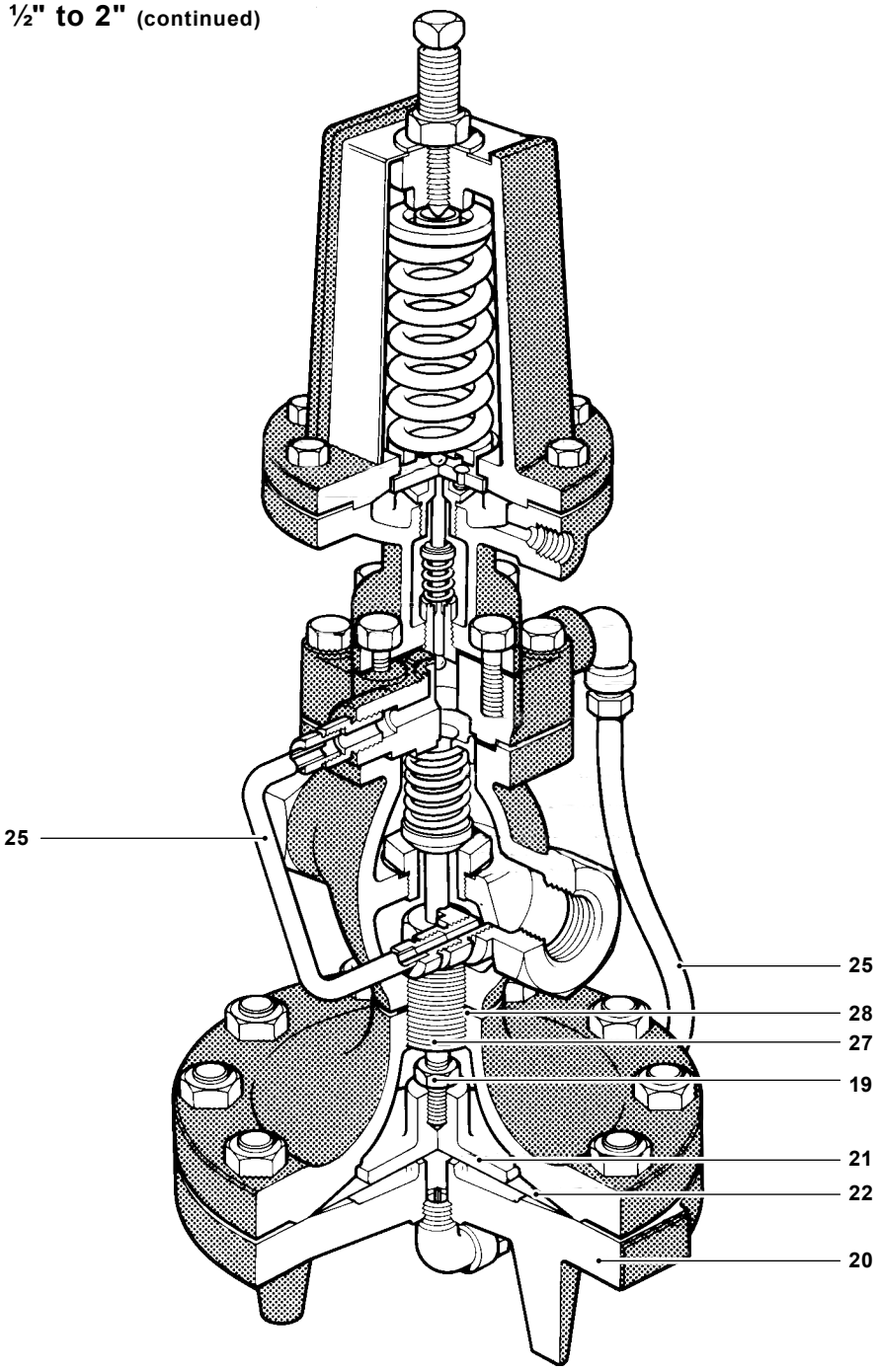
25P ½" to 2"

No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
6	Main Valve Seat Gasket	Copper	

No.	Part	Material	
7	Valve Return Spring	Stainless steel	
11	Spring Guide	Cast iron ½"-2" (DN15 - DN50)	
		CRS 2"* - 4" (DN50 - DN100)	*ANSI 300 only
13	Cover Gasket	Graphite	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB

Materials continued on next page

Materials - 25P ½" to 2" (continued)



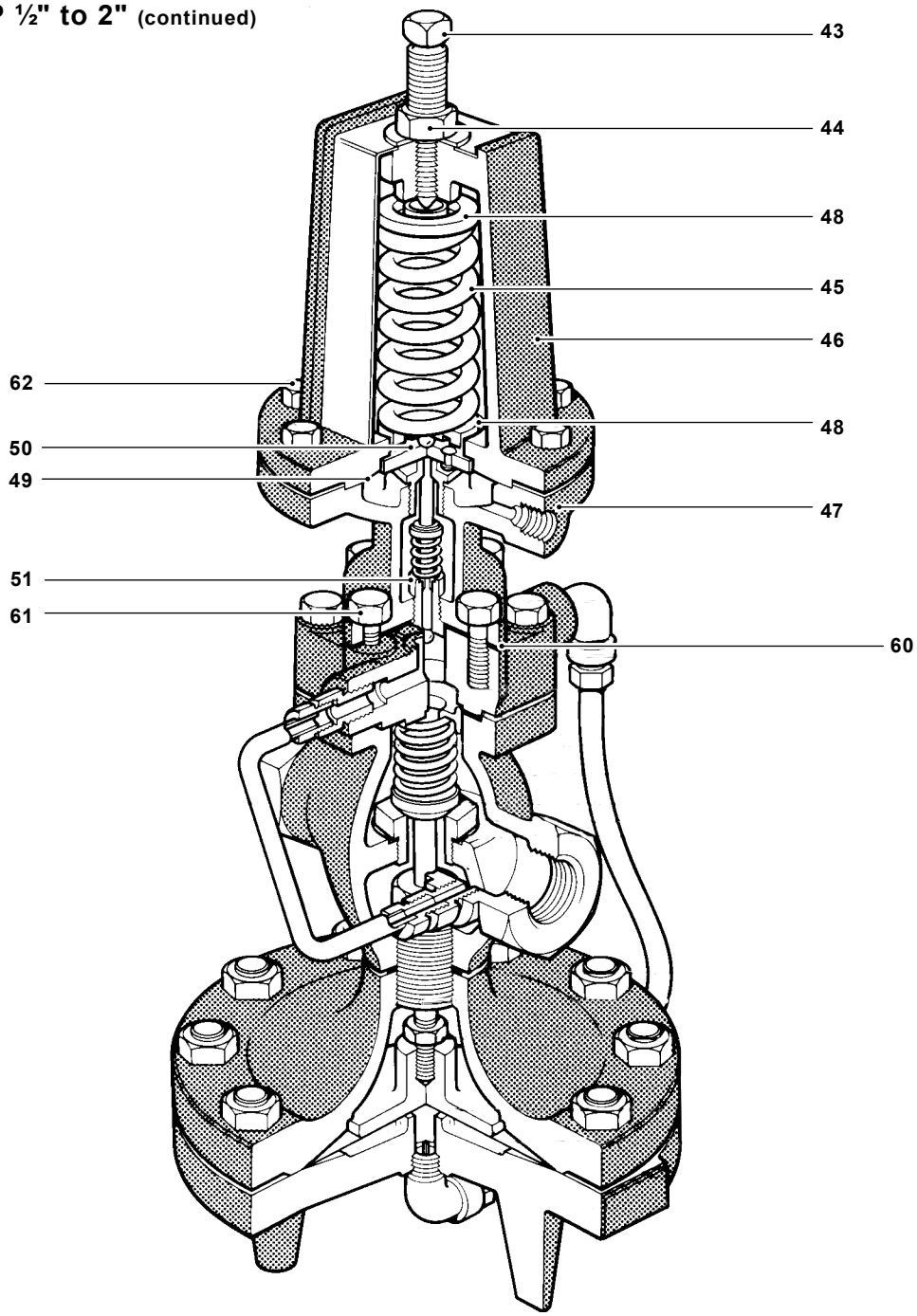
25P ½" to 2"

No.	Part	Material	
19	Nut	Brass ½" - 2" (DN15 - DN50)	
		Steel 2"* - 4" (DN50 - DN100)	*ANSI 300 only
20	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Stainless steel ½" - 2" (DN15 - DN50)	
		C.I. 2"* - 4" (DN50 - DN100)	*ANSI 300 only

No.	Part	Material	
22	Main Diaphragm (2 ply)	Stainless steel	
25	Tubing Assembly	Copper	
		Brass	
27	Connector Stud	Stainless steel	
28	Body Gasket	Copper Clad ½" - 2" (DN15 - DN50)	
		Graphite 2"* - 4" (DN50 - DN100)	*ANSI 300 only

Materials continued on next page

Materials - 25P ½" to 2" (continued)

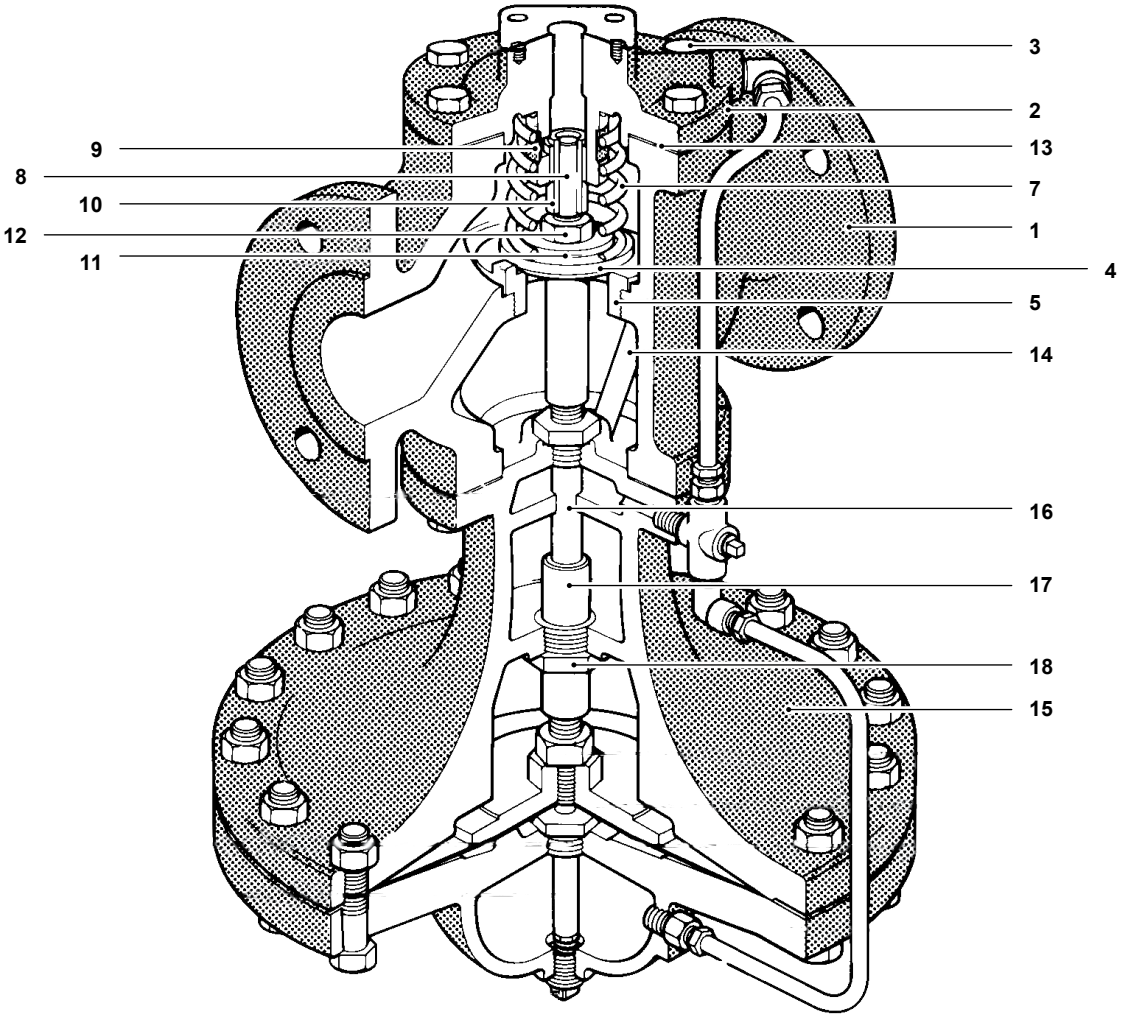


25P ½" to 2"

No.	Part	Material	
43	Adjustment Screw	Stainless steel	
44	Jam Nut	Brass	
45	Pilot Valve Spring	Steel	
46	Upper Diaphragm Case	Cast iron	
		Cast steel	
47	Lower Diaphragm Case	Cast iron	
		Cast steel	
48	Spring Plate	Steel	ASTM A569

No.	Part	Material	
49	Diaphragm	Stainless steel	
50	Diaphragm Plate	Stainless steel	
51	Pilot Head Spring	Stainless steel	
60	Pilot Gasket	Graphite	
61	Pilot Mounting Screws	Steel	ASTM A449
62	Diaphragm Case Screws	Steel	

Materials - 2"* to 4" *ANSI 300 only

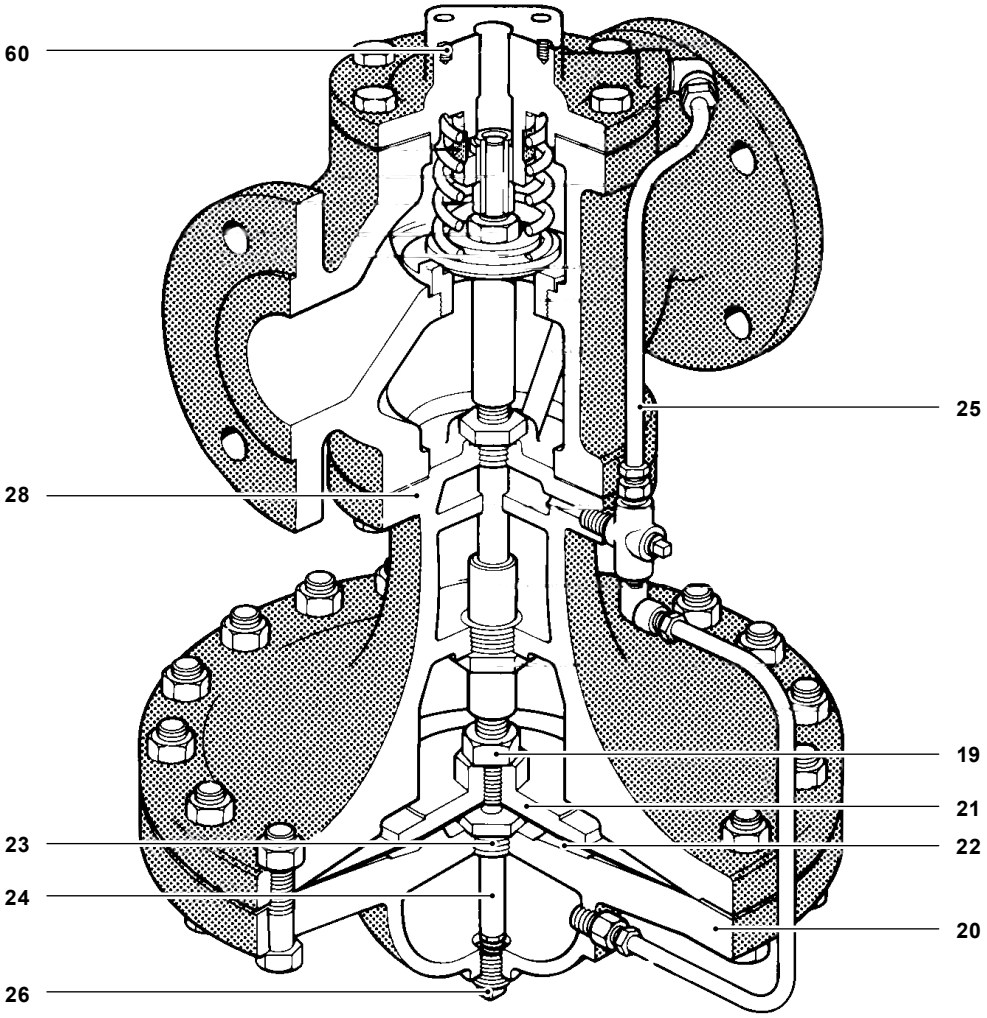


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
7	Valve Return Spring	Stainless steel	
8	Valve Stem	Stainless steel	
9	Strainer Screen	Stainless steel	
10	Valve Stem Sleeve	Stainless steel	

No.	Part	Material	
11	Spring Guide	Cast iron ½"-2" (DN15 - DN50)	
		CRS 2"* - 4" (DN50 - DN100)	*ANSI 300 only
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless steel	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
16	Stem Bushing (2½" - 4" Cast steel only)	Stainless steel	
17	Diaphragm Plate Stem	Stainless steel	AISI 304
18	Diaphragm Stem Guide	Stainless steel	AISI 303

Materials continued on next page

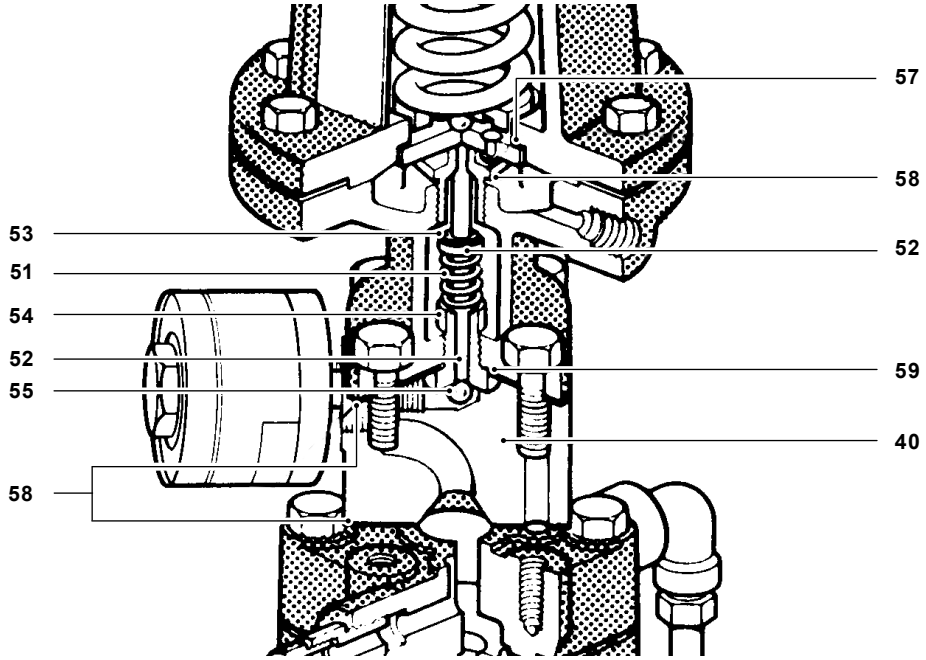
Materials - 2"* to 4" *ANSI 300 only (continued)



No.	Part	Material	
19	Nut	Brass ½" - 2" (DN15 - DN50)	
		Steel 2"* - 4" (DN50 - DN100)	
20	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Stainless steel ½" - 2" (DN15 - DN50)	
		C.I. 2"* - 4" (DN50 - DN100)	*ANSI 300 only
22	Main Diaphragm (2 ply)	Stainless steel	
23	Bushing	CRS	

No.	Part	Material	
24	Tube and Orifice	Stainless steel	
25	Tubing Assembly	Copper	
		Brass	
26	Plug (Cast iron)	Brass	
	Plug (Cast steel)	Steel	
28	Body Gasket	Copper Clad ½" - 2" (DN15 - DN50)	
		Graphite 2"* - 4" (DN50 - DN100)	*ANSI 300 only
60	Pilot Gasket	Graphite	

Materials - PE Pilot ½" to 4"



No.	Part	Material	
40	Electric Pilot Adapter	Cast iron	ASTM A 126 CL B
		Bronze	ASTM B62
51	Pilot Head Spring	Stainless steel	
52	Spring Retainer Cup	Stainless steel	
53	Retaining Ring	Brass	
54	Pilot Seat	Stainless steel	
55	Pilot Head	Stainless steel	
57	Stem Guide	Stainless steel	
58	Stem Guide Gasket	Stainless steel	
59	Seat Gasket	Stainless steel	

Downstream pressure ranges

For the following downstream pressures, three color-coded pilot valve springs are available:

Yellow	Blue	Red
3 to 30 psi (0.21 to 2.1 bar)	20 to 100 psi (1.4 to 6.9 bar)	80 to 250 psi (5.5 to 17.2 bar)

Typical applications

Steam pressure reducing applications where the PRV must also respond to an electrical program timer, safety or limit switch, or remote manual switch.

Pressure shell design conditions

PMA Maximum allowable pressure	Cast iron:	250 psi g/0-450 °F	17 bar g/0-232 °C
	Cast steel:	300 psi g/0-600 °F	21 bar g/0-316 °C
TMA Maximum allowable temperature	Cast iron:	450 °F/0-250 psi g	232 °C/0-17 bar g
	Cast steel:	600 °F/0-300 psi g	316 °C/0-21 bar g

Capacities

For selection and sizing data, see TI-P717-08-US.

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The pressure sensing line should be located in a straight section of the downstream piping at least 10 pipe diameters from the nearest fitting. Complete installation instructions are given in IM-3-000-US.

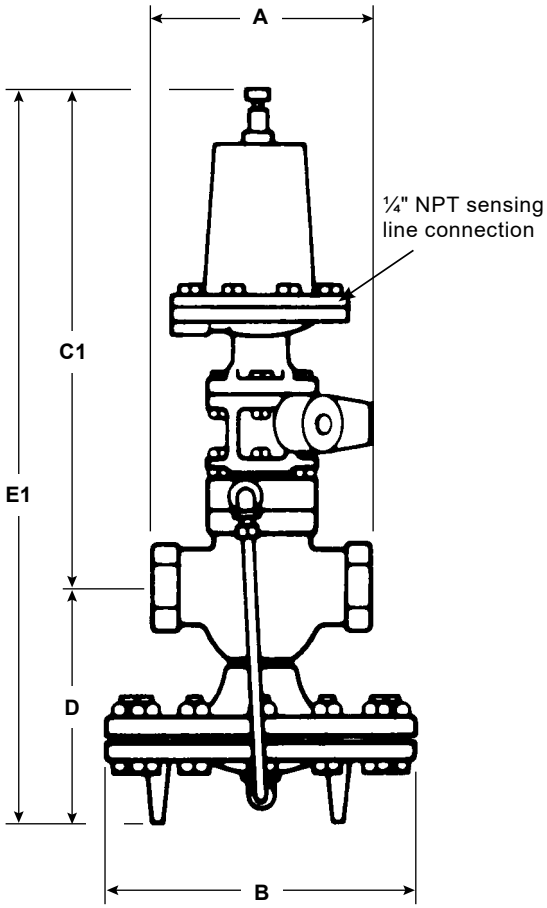
Maintenance

Complete installation and maintenance instructions are given in IM-3-000-US, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P717-09-US.

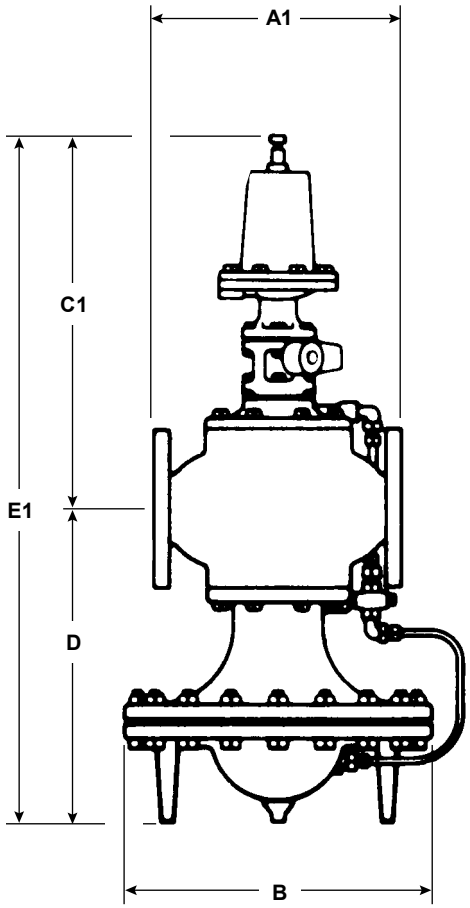
Sample specification

The pressure regulator shall be of the pilot-actuated diaphragm operated type. The main valve shall be single-seated with hardened stainless steel trim; the regulator body shall be cast iron (cast steel). The pilot shall be bolted directly to the regulator body. The main valve shall be capable of dead-end shut-off. The electric pilot shall have a NEMA 4 and 7 (C and D) enclosure with 115v (230v) 60 Hz coil.

Dimensions/weights (nominal) in inches (mm) and lbs (kg)



½" to 2"



2"* to 4"

		ANSI 125 ANSI 250	ANSI 300					Weight	
Size	A	A1	A1	B	C1	D	E1	Cast iron	Cast steel
½", ¾"	5.5 (140)			7.6 (193)	14.1 (358)	6.2 (157)	20.6 (524)	36 lb (16.3 kg)	39 lb (17.7 kg)
1"	6.0 (152)			8.6 (219)	14.4 (365)	6.75 (171)	21.1 (536)	43 lb (19.5 kg)	47 lb (21.3 kg)
1¼", 1½"	7.25 (184)			8.6 (219)	14.9 (379)	7.1 (180)	22.0 (559)	48 lb (21.8 kg)	52 lb (23.6 kg)
2"	8.5 (216)		9.0 (229)	10.6 (270)	15.6 (396)	8.2 (208)	23.75 (603)	73 lb (33.1 kg)	80 lb (36.3 kg)
2½"		10.9 (276)	11.5 (292)	13.6 (346)	16.25 (413)	13.9 (353)	30.2 (767)	160 lb (72.6 kg)	175 lb (79.4 kg)
3"		11.75 (298)	12.5) (318)	13.6 (346)	16.2 (411)	14.4 (365)	30.6 (778)	191 lb (86.6 kg)	208 lb (94.3 kg)
4"		13.9 (353)	14.5 (368)	15.6 (397)	17.5 (445)	16.1 (409)	33.6 (854)	287 lb (130 kg)	313 lb (142 kg)

TI-P235-08-US
Issue 1

Pilot Operated Pressure Regulator with Electric Override 6" 25PE

Description

The 25PE has all of the features of the 25P, with the addition of an electric pilot. An electrical signal can override the pressure pilot. This valve meets Class IV shut-off specifications but is not suitable for dead-end service.

Model	25PE	
Sizes	6" (DN150)	
Connections	ANSI 125, 250	ANSI 150, 300
Construction	Cast Iron	Cast Steel
Options	Reduced Orifice Designated by "S"	
Electric pilot specifications	Enclosure: NEMA 4 & 7 (C&D) 115v (230v)/60Hz Inrush: 45 VA Normally closed 200 psi g (14 bar g) Max. operating pressure	
Electric pilot options	At pressures below 125 psi g (9 bar g), use the following electric pilot: Enclosure: NEMA 4 & 7 (C&D) 115v (230v)/60Hz Inrush: 45 VA Normally closed 140 psi g (10 bar g) Max Operating Pressure	

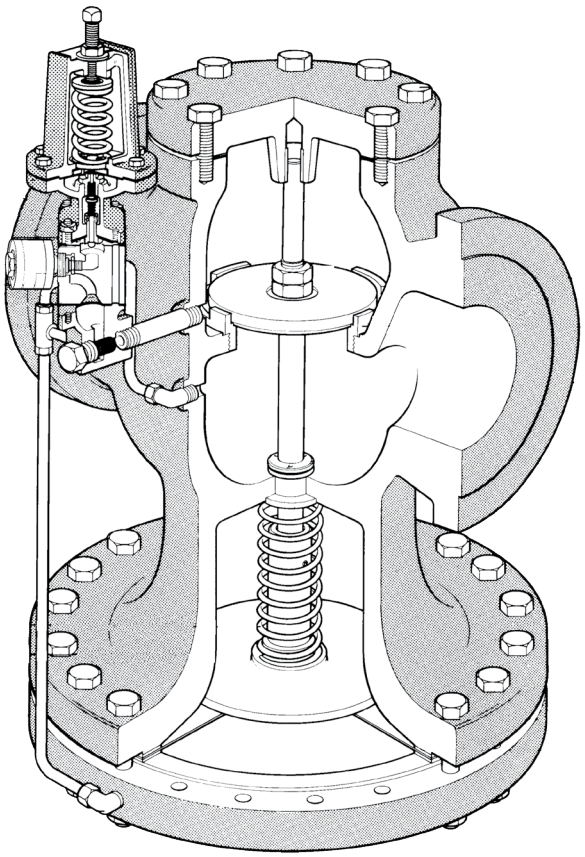
Typical applications

Steam pressure reducing applications where the PRV must also respond to an electrical program timer, safety or limit switch, or remote manual switch.

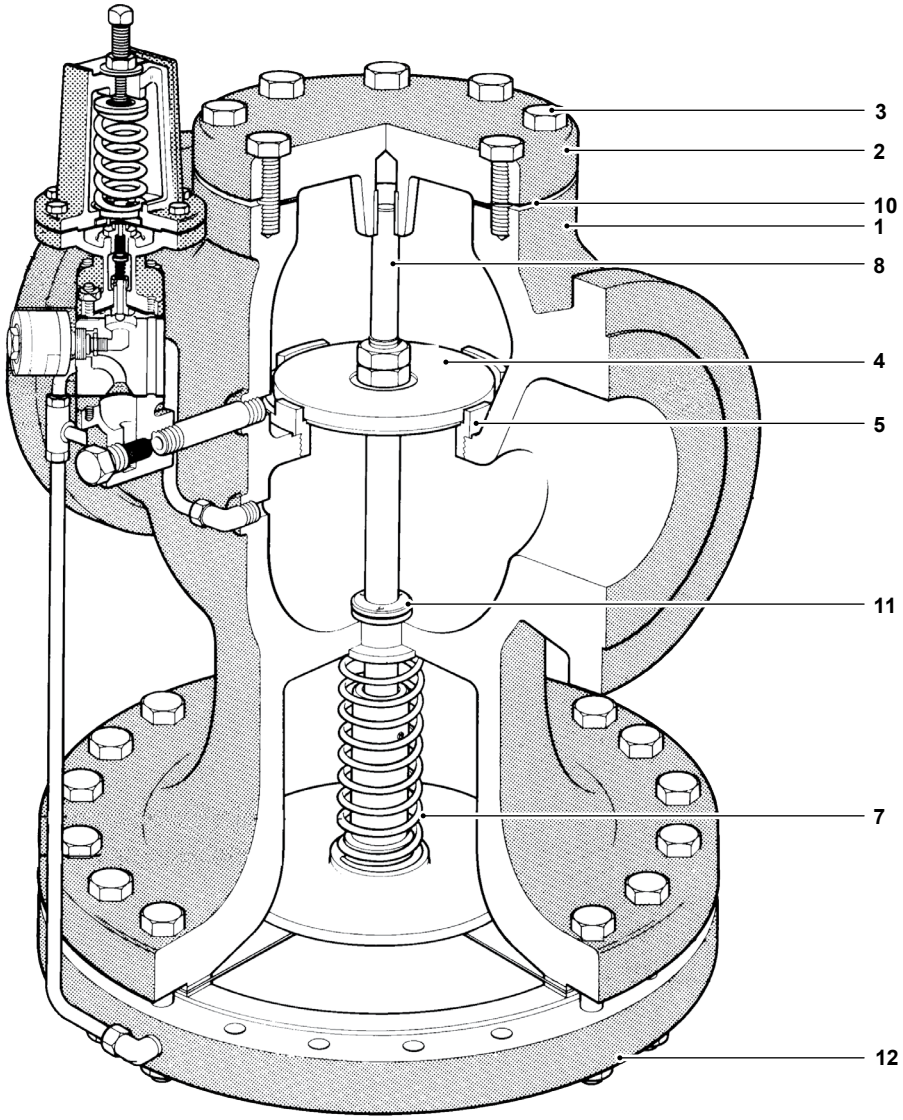
Downstream pressure ranges

For the following downstream pressures, three color-coded pilot valve springs are available:

Yellow:	**Blue:**	**Red:**
3 to 30 psi (0.2 to 2 bar)	20 to 100 psi (1.4 to 6.9 bar)	80 to 250 psi (5.5 to 17.2 bar)



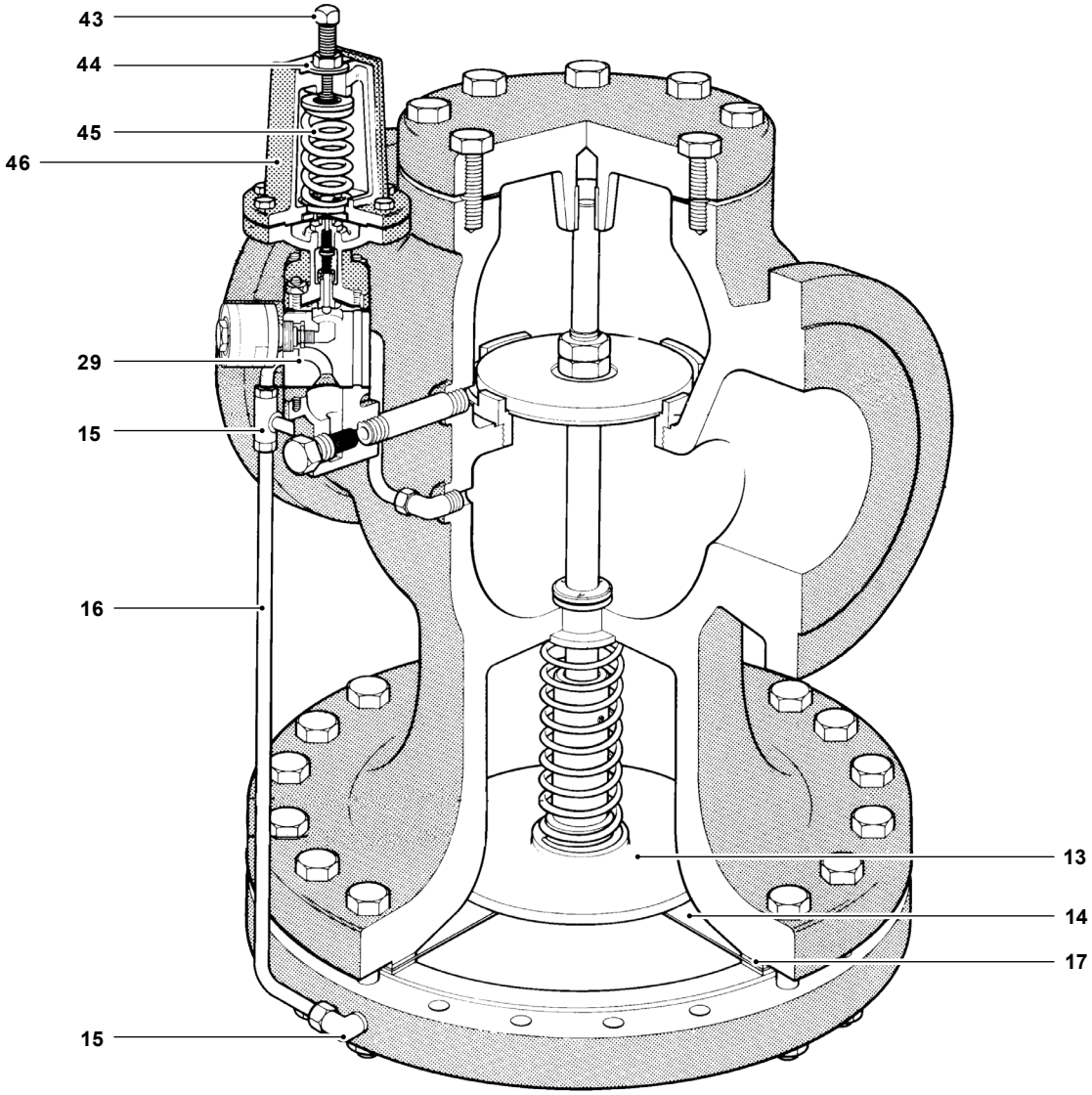
Materials



No.	Part	Material	
1	Valve Body	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B
2	Cover	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B
3	Cover Bolts	Steel	AISI 1038
4	Main Valve Head	Stainless Steel	ASTM A 743 CA 40
5	Main Valve Seat	Stainless Steel	ASTM A 743 CA 40
7	Valve Return Spring	Stainless Steel	AISI 302
8	Valve Stem	Stainless Steel	AISI 304
10	Cover Gasket	Graphite	BS 2815A
11	Stem Bushing	Brass	ASTM B16
12	Lower Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B

Materials continued on next page

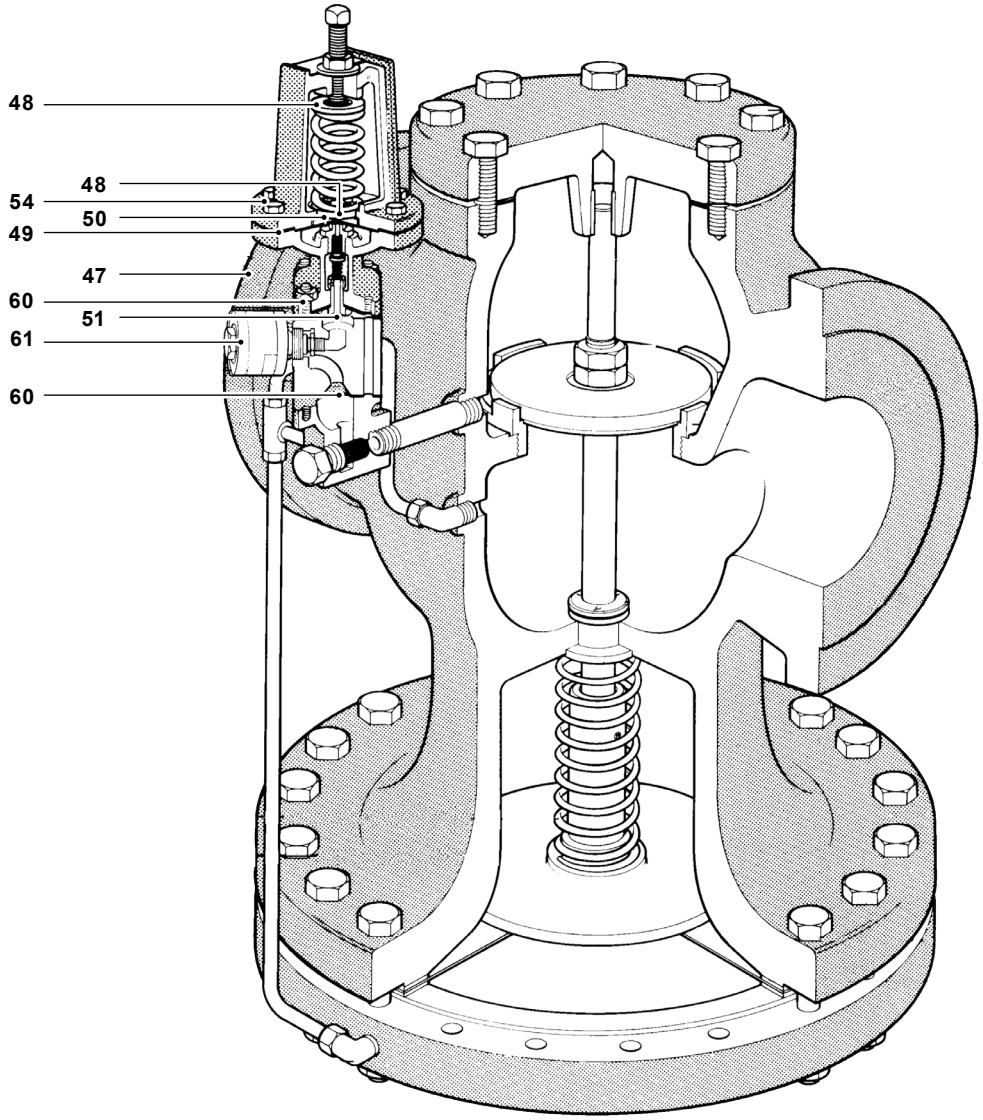
Materials (continued)



No.	Part	Material	
13	Diaphragm Plate	Stainless Steel	ASTM A 743 CA 40
14	Main Diaphragm (2 ply)	Stainless Steel	ASTM A240
15	Tube & Orifice	Brass	ASTM B16
16	Tubing Assembly	Copper	ASTM B280 (122)
17	Diaphragm Gasket (2)	Graphite	BS 2815A
29	Electric Pilot Adapter	Cast Iron	ASTM A 126 CL B
43	Adjustment Screw	Stainless Steel	AISI 304
44	Jam Nut	Brass	ASTM B6
45	Pilot Valve Spring	Steel	AISI 1060
46	Upper Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B

Materials continued on next page

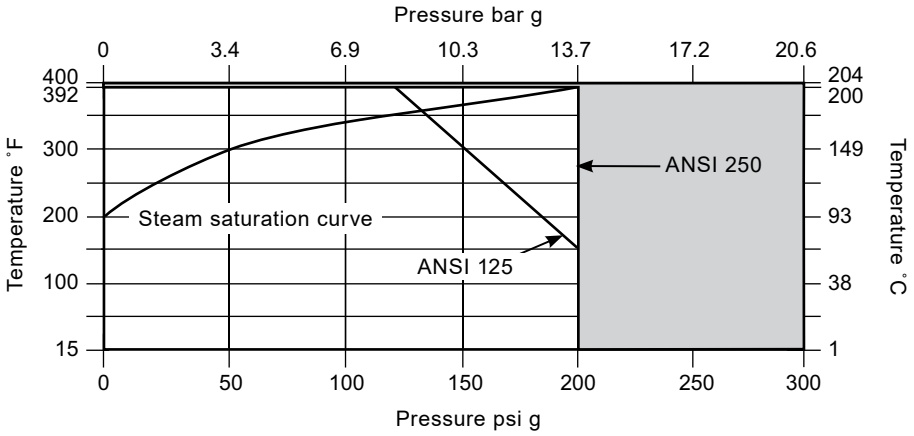
Materials (continued)



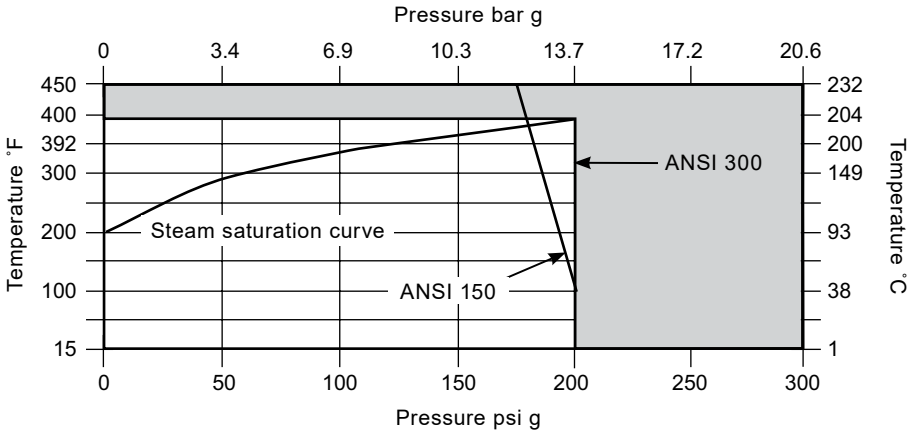
No.	Part	Material	
47	Lower Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B
48	Spring Plate	Steel	ASTM A569
49	Diaphragm	Stainless Steel	ASTM A240
50	Diaphragm Plate	Brass	ASTM B36
51	Head & Seat Assembly	Stainless Steel	AISI 440
		Stainless Steel	AISI 440F
54	Diaphragm Case Screws	Steel 5/16" - 18 x 1"	ASTM A449
60	Pilot Gasket	Graphite	
61	Electric Solenoid Valve		

Limiting operating conditions

Cast iron

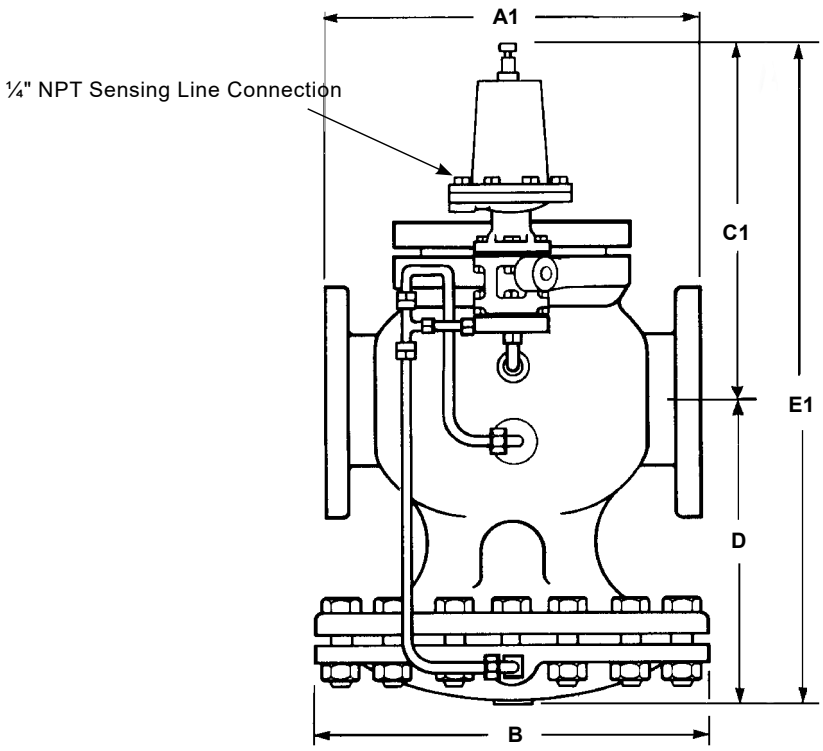


Cast steel



The product should not be used in shaded area.

Dimensions/weights (approximate) in inches (millimeters) and lbs (*kg*)



	ANSI 125/150	ANSI 250/300					
Size	**A1**	**A1**	**B**	**C1**	**D**	**E1**	**Weight**
6"	18.1 (460)	18.9 (480)	19.75 (502)	17.2 (437)	17.1 (434)	34.3 (872)	595 lb (270 kg)

Cv Values

Size	6"	6" "S"
Cv value	280	156

Sample specifications

The pressure regulator shall be of the pilot-actuated diaphragm operated type. The main valve shall be single-seated with hardened stainless steel trim; the valve body shall be cast iron. The pilot shall be externally mounted to the regulator body. The electric pilot shall have a NEMA 4 & 7 (C & D) enclosure with 115v (230v) 60 Hz coil.

Capacities

For selection & sizing data, see TI-P717-08-US.

Installation

The valve should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the valve. The trap and regulator should both be protected with a strainer separator set. The pressure sensing line should be located in a straight section of the downstream piping at least 10 pipe diameters from the nearest fitting. Complete installation instructions are given in IM-3-000-US.

Maintenance

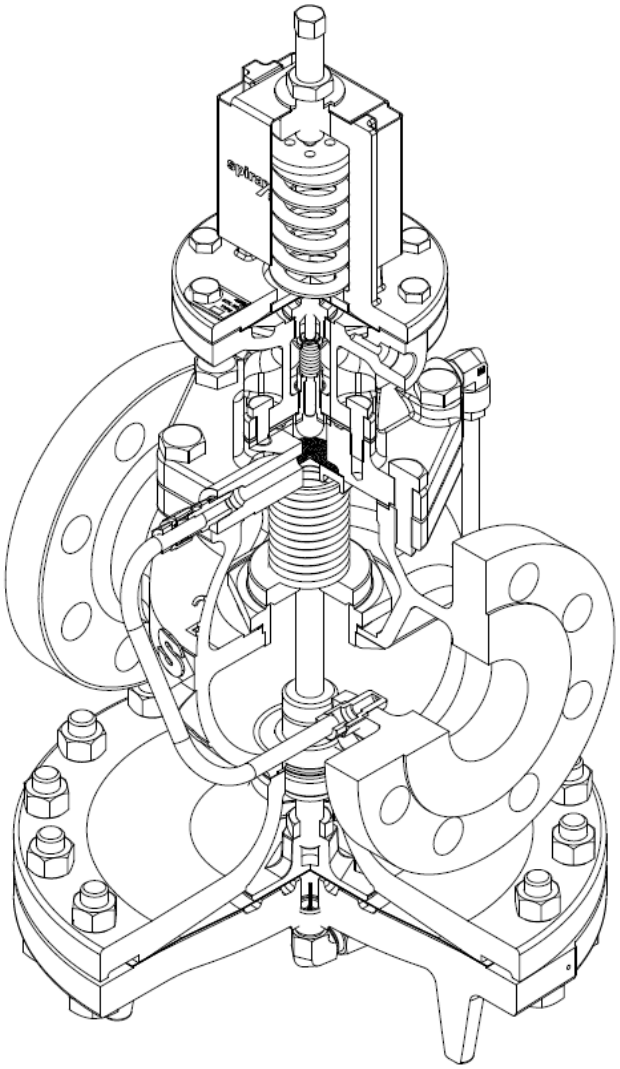
Complete installation and maintenance instructions are given in IM-3-000-US and ADVP 3029, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P335-11-US and TI-P235-02-US.

TI-P717-01-US
Issue 1

Pilot Operated Pressure Reducing Valves with Cast Iron Bodies 1" to 4" 26P, 26PA, 26PE and 26BP

Description

The 26P, 26PA, 26PE and 26BP self-actuated pilot-operated pressure regulator have been manufactured using cast iron.



Available types

26P	Downstream pressure is fed back through an external sensing line to the pressure pilot, which adjusts the opening of the main valve so as to maintain the set pressure. The main valve can close tight for ANSI/FCI 70-2 Class IV shut off when steam is not required.
26PA	The Pressure Pilot is loaded by an external compressed air supply rather than by a spring. The downstream pressure can be set remotely by adjusting the loading air pressure.
26PE	An electrical signal can override the pressure pilot to provide a remote shut-off capability. **Note***: For pressures below 15 psi g, the E pilot is not recommended for use with valves 2½" and larger.
26BP	Maintains a constant upstream pressure in a piping system. The reverse-acting pressure pilot opens the main valve when the sensed upstream pressure increases. The 26BP is NOT a safety valve and should NEVER be used as such.

Sizes and pipe connections

1", 1¼", 1½"	ANSI 125, only
2", 2½", 3" and 4"	ANSI 125 and ANSI 250

Typical applications

The 26P/PA is a reliable, accurate regulator to reduce steam from a high supply pressure to the most efficient operating pressure of the equipment, and to protect the equipment from dangerously high pressures.

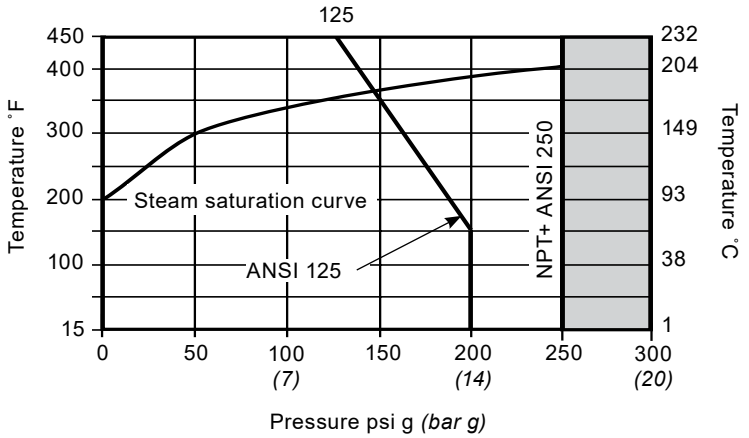
The 26PE is a steam pressure reducing applications where the PRV must also respond to an electrical program timer, safety or limit switch, or remote manual switch.

The 26BP modulates the release of surplus steam ensures that the set maximum pressure in the steam space or upstream piping will not be exceeded. Flash steam recovery systems to release excess flash steam limits the flash tank pressure. For elimination of non-critical loads, see TI-P717-07-US.

Capacities

For selection and sizing data, see TI-P717-08-US.

Pressure/temperature limits



The product should not be used in shaded area.

Downstream pressure ranges

26P, 26PE and 26BP	For the following downstream pressures, three color-coded pilot valve springs are available:	Yellow 3 to 30 psi	Blue 20 to 100 psi	Red 80 to 250 psi
26PA		For proper selection, see TI-P717-08-US 3 to 100 psi g		

Cv values

The Cv maximum values shown below are full capacities and should be used for safety valve sizing purposes only.

½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"
3.48	6.5	10.5	14	20	35	56	74	115

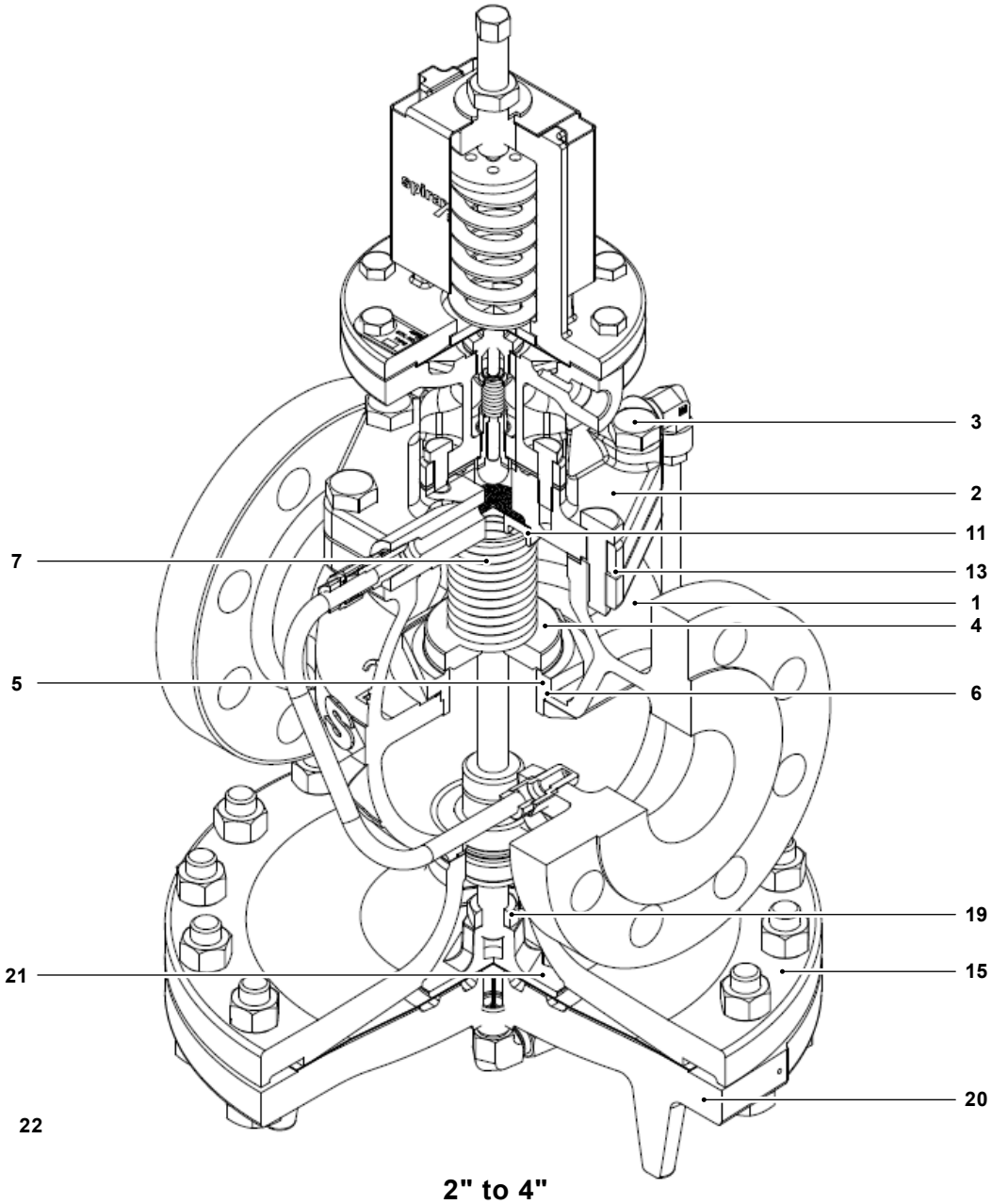
Note: Where the internal balance pipe is used the valve capacity will be reduced.

Limiting operating conditions

PMO	Maximum operating pressure	26P, 26PA and 26BP	ANSI 125: 125 psi g *(8 bar g)* @ 450 °F *(232 °C)*
			ANSI 250: 250 psi g *(17 bar g)* @ 450 °F *(232 °C)*
		26PE	ANSI 125: 125 psi g *(8 bar g)* @ 392 °F *(200 °C)*
			ANSI 250: 200 psi g *(14 bar g)* @ 392 °F *(200 °C)*
TMO	Maximum operating temperature	26P, 26PA and 26BP	450 °F *(232 °C)*
		26PE	392 °F *(200 °C)*
Pressure shell design conditions			
PMA	Maximum allowable pressure		250 psi g *(17 bar g)* @ 0-450 °F *(0-232 °C)*
TMA	Maximum allowable temperature		450 °F *(0-232 °C)* @ 0-250 psi g *(17 bar g)*

Materials

Parts 1 to 22



2" to 4"

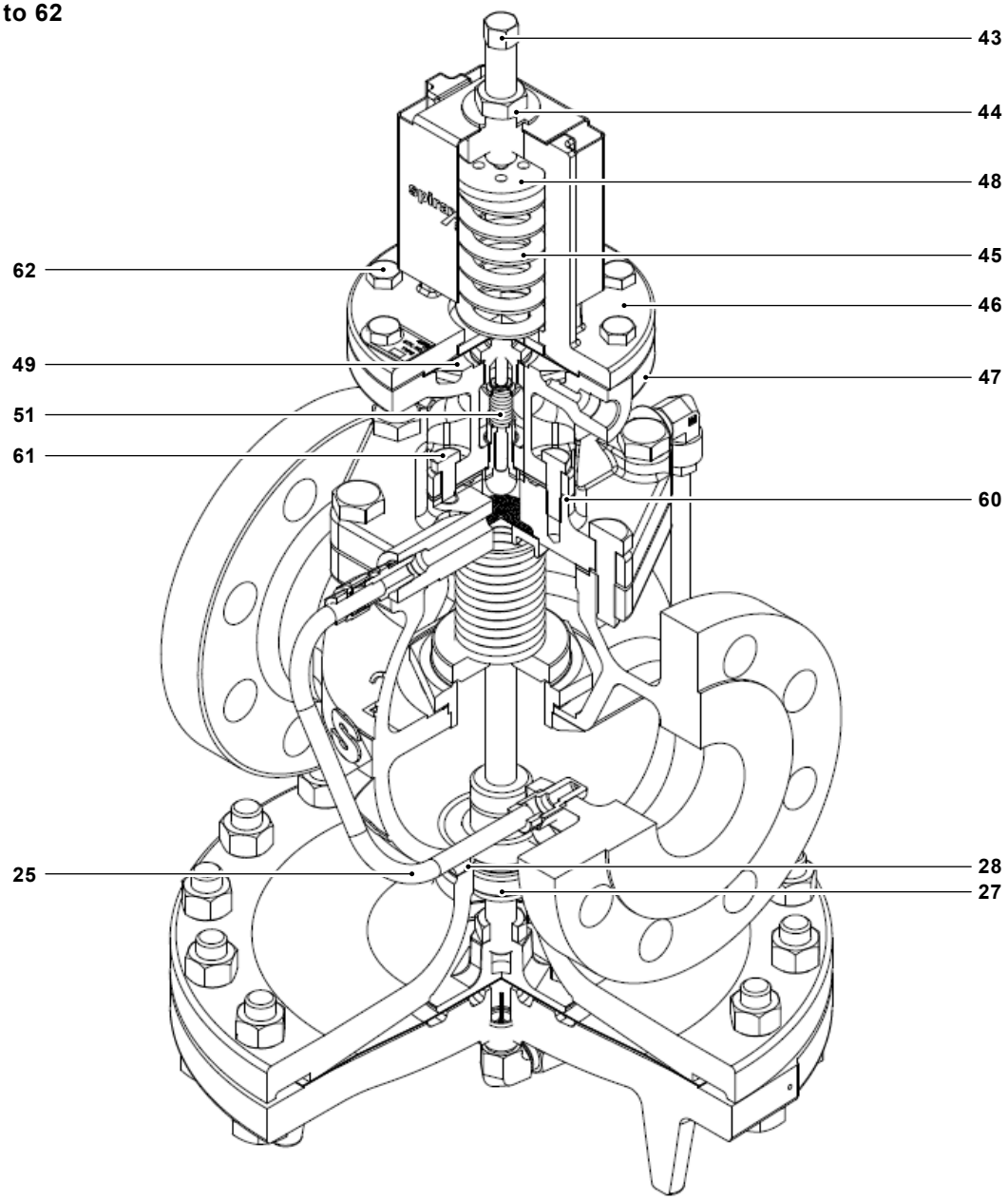
No.	Part	Material	
1	Valve body	Cast iron	ASTM A 126 CL B
2	Cover	Cast iron	ASTM A 126 CL B
3	Cover bolts	Steel	ASTM A449
4	Main valve head	Stainless steel	
5	Main valve seat	Stainless steel	
6	Main valve seat gasket	Copper	
7	Valve return spring	Stainless steel	
11	Spring guide	Cast iron ½"-2" CRS 2"* - 4"	

No.	Part	Material	
13	Cover gasket	Graphite	
15	Upper diaphragm case	Cast iron	ASTM A 126 CL B
19	Nut	Brass ½" - 2" Steel 2"* - 4"	
20	Lower diaphragm case	Cast iron	ASTM A 126 CL B
21	Diaphragm plate	Stainless steel ½" - 2" C.I. 2"* - 4"	
22	Main diaphragm (2 ply)	Stainless steel	

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Materials

Parts 25 to 62



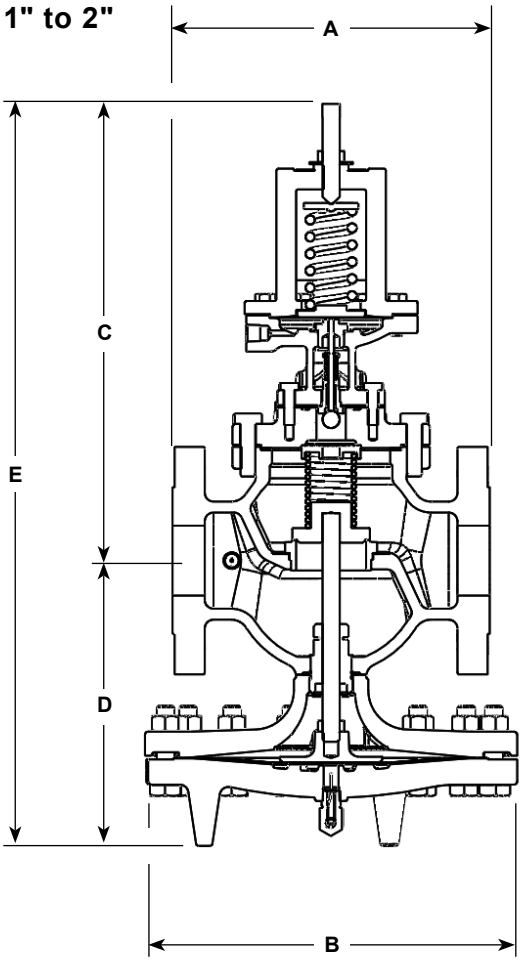
2" to 4"

No.	Part	Material
25	Tubing assembly	Copper Brass
	(optional for cast steel)	Stainless steel
27	Connector stud	Stainless steel
28	Body gasket	½" - 2" Copper Clad 2"* - 4" Graphite
43	Adjustment screw	Stainless steel
44	Jam nut	Brass
45	Pilot valve spring	Steel

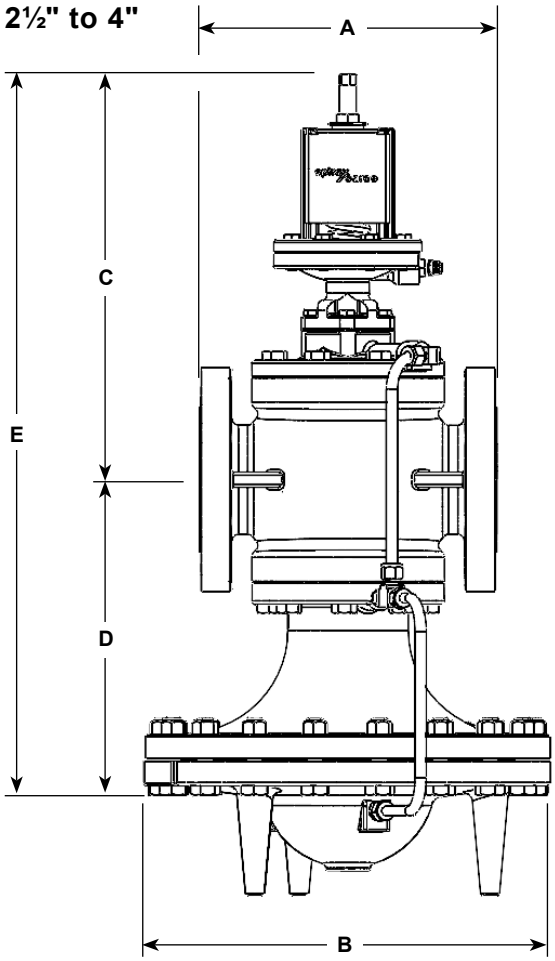
No.	Part	Material	
46	Upper diaphragm case	Cast iron	ASTM A 126 CL B
47	Lower diaphragm case	Cast iron	ASTM A 126 CL B
48	Spring plate	Steel	
49	Diaphragm (2 ply)	Stainless steel	
51	Pilot head spring	Stainless steel	
60	Pilot gasket	Graphite	
61	Pilot mounting screws	Steel	
62	Diaphragm case screws	Steel	ASTM A449

Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)

1" to 2"

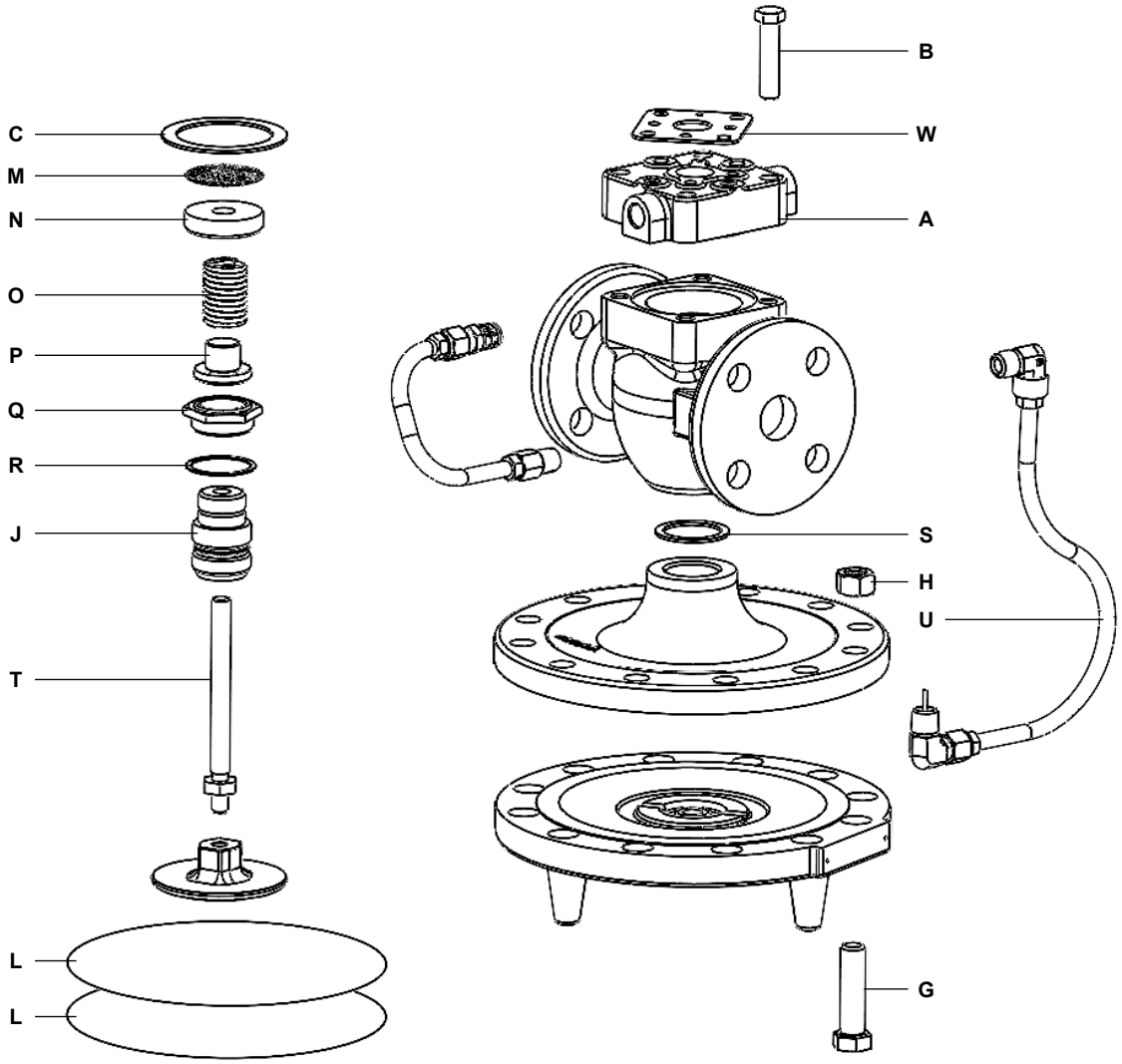


2½" to 4"



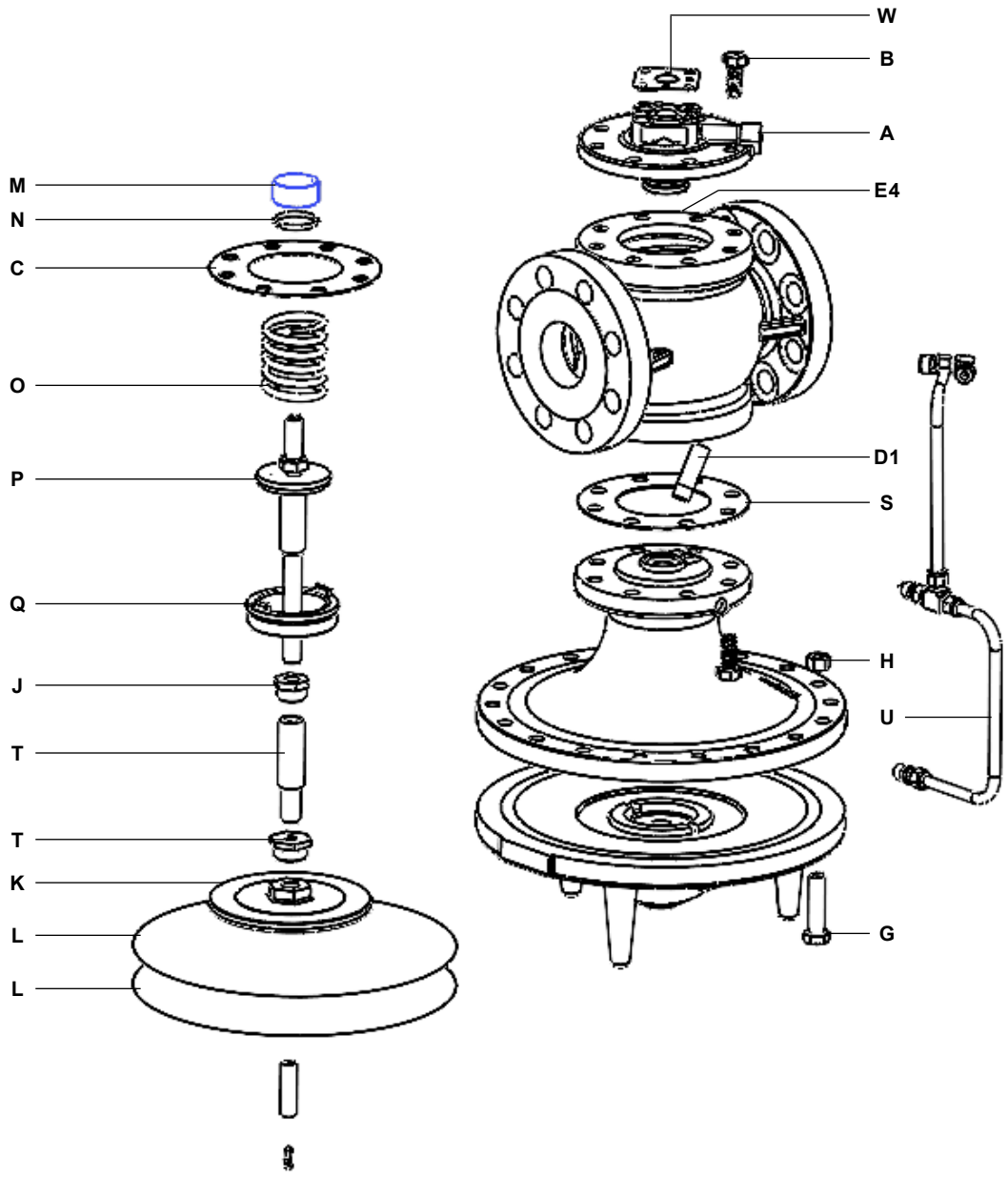
Size	ANSI 125 A	ANSI 250 A	B	C	D	E	Weight
1"	5.50		8.63	11.89	6.69	18.58	39
	139.70		*219.20*	*302.01*	*169.93*	*471.93*	*17.7*
1¼"	6.75		8.63	12.39	7.06	19.46	44
	171.45		*219.20*	*314.71*	*179.32*	*494.28*	*20*
1½"	6.87		8.63	12.39	7.06	19.46	44
	174.49		*219.20*	*314.71*	*179.32*	*494.28*	*20*
2"	8.50	9.00	10.63	13.08	8.13	21.21	69
	215.90	*228.60*	*270.00*	*332.23*	*206.50*	*538.73*	*31.3*
2½"	9.44	10.04	13.63	13.64	13.94	27.58	157
	239.78	*255.02*	*346.20*	*346.46*	*354.08*	*700.53*	*71.2*
3"	10.04	10.78	13.63	14.73	15.62	30.35	188
	255.01	*273.81*	*346.20*	*374.14*	*396.75*	*770.89*	*85.3*
4"	11.94	12.50	15.63	14.80	16.09	30.89	284
	303.28	*317.50*	*396.88*	*375.92*	*408.69*	*784.61*	*129*

Spare parts - 1" to 2"



Cover Assembly with Cap Screws and Gasket	**A,B, C**
Diaphragm Case Bolts and Nuts	**G,H**
Screen, Spring Support Disc, Valve Spring and Cap Gasket	**M, N, O, C**
Cap Gasket, Valve Head, Seat and Seat Gasket (2)	**C, P, Q, R**
Valve Stem Guide and Gasket	**J, S, T**
Diaphragm Plate	**K**
Diaphragms (2 ply)	**L**
Transmission Tubing with Assembly	**U, V**
Gasket Kit	**C, R, S, W**
Rebuild Kit	**B, C, L, M, O, P, Q, R, U, V, W**

Spare parts - 2½" to 4"



Cover Assembly with Cap Screws and Gasket	**A,B, C**
Diaphragm Case Bolts and Nuts	**G,H**
Screen, Spring Support Disc, Valve Spring and Cap Gasket	**M, N, O, C**
Cap Gasket, Valve Head, Seat and Seat Gasket (2)	**C, P, Q, X**
Diaphragms (2 ply)	**L**
Transmission Tubing with Assembly	**U**
Gasket Kit	**S, W, C**
Damping Assembly	**A1, B1, C1**
Diaphragm Plate	**K**
Lower Stem and Guide	**J, T**
Relief Tube	**D1**
Rebuild Kit	**B, C, L, M, O, P, Q, R, U, W**

Sample specification

The pressure regulator shall be of the pilot-actuated diaphragm operated type. The main valve shall be single-seated with hardened stainless steel trim; the regulator body shall be cast iron (cast steel). The pilot shall be bolted directly to the regulator body.

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The pressure sensing line should be located in a straight section of the downstream piping at least 10 pipe diameters from the nearest fitting. Complete installation instructions are given in IM-P717-06-US.

Maintenance

Complete installation and maintenance instructions are given in IM-P717-06-US, a copy of which is supplied with each regulator.

Spare parts

Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

TI-P717-08-US
Issue 1

Sizing and Selection Chart
25P, 25PE, 25PA, 26P, 26PE, 26PA and all combinations

Capacities

Inlet steam pressure psi g	Outlet steam pressure psi g	Nominal valve size									
		½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6" (25-Series, only)
	C.V. Factors	3.48	6.5	10.5	14	20	35	56	74	115	280
15	10	95	175	285	380	540	950	1,500	2,000	3,100	7,140
	5	135	250	405	545	780	1,365	2,185	2,890	4,480	10,373
	3	155	285	465	620	880	1,550	2,470	3,260	5,080	11,669
20	12	120	230	365	490	700	1,225	1,960	2,590	4,025	9,282
	8	155	290	470	630	900	1,575	2,520	3,330	5,175	11,934
	0-5	180	335	540	720	1,025	1,795	2,870	3,790	5,895	13,592
25	15	145	270	435	580	830	1,450	2,325	3,070	4,770	11,006
	10	195	360	580	775	1,110	1,950	3,110	4,110	6,385	14,719
	0-7	205	385	620	825	1,180	2,065	3,305	4,360	6,785	15,647
30	20	155	290	470	630	900	1,575	2,520	3,330	5,175	11,934
	15	220	410	665	890	1,270	2,220	3,555	4,700	7,300	16,840
	0-12	230	430	695	925	1,320	2,310	3,695	4,885	7,590	17,503
40	30	155	290	470	630	900	1,575	2,520	3,330	5,175	11,934
	25	250	470	755	1,010	1,440	2,520	4,030	5,330	8,280	19,094
	0-18	280	525	850	1,135	1,620	2,835	4,535	5,995	9,315	21,481
50	40	190	355	575	770	1,100	1,925	3,080	4,070	6,325	14,586
	30	315	585	955	1,275	1,820	3,185	5,095	6,735	10,465	24,133
	0-21	350	650	1,050	1,400	2,000	3,500	5,600	7,400	11,500	26,520
60	45	280	520	840	1,120	1,600	2,800	4,480	5,920	9,200	21,216
	35	360	670	1,080	1,440	2,060	3,605	5,770	7,620	11,845	27,316
	0-27	385	720	1,165	1,555	2,220	3,885	6,215	8,215	12,765	29,437
75	60	280	525	850	1,135	1,620	2,835	4,535	5,995	9,315	21,481
	50	415	775	1,250	1,665	2,380	4,165	6,665	8,800	13,685	31,559
	0-35	470	875	1,415	1,890	2,700	4,725	7,560	9,990	15,525	35,802

Continued on next page

Capacities (continued)

Inlet steam pressure psi g	Outlet steam pressure psi g	Nominal valve size									
		½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6" (25-Series, only)
	C.V. Factors	**3.48**	**6.5**	**10.5**	**14**	**20**	**35**	**56**	**74**	**115**	**280**
85	70	290	540	870	1,160	1,660	2,905	4,650	6,140	9,545	22,012
	50	490	915	1,480	1,965	2,820	4,935	7,895	10,435	16,215	37,393
	0-43	515	960	1,555	2,070	2,960	5,180	8,290	10,950	17,020	39,250
100	80	370	690	1,115	1,485	2,120	3,710	5,935	7,845	12,190	28,111
	60	580	1,080	1,740	2,325	3,320	5,810	9,295	12,285	19,090	44,023
	0-48	600	1,120	1,815	2,420	3,460	6,055	9,690	12,800	19,895	45,900
125	100	440	825	1,335	1,780	2,540	4,445	7,110	9,400	14,600	33,660
	80	680	1,275	2,060	2,745	3,920	6,860	10,975	14,500	22,540	51,979
	0-62	730	1,365	2,200	2,940	4,200	7,350	11,760	15,540	24,150	55,692
150	125	490	910	1,470	1,960	2,800	4,900	7,840	10,360	16,100	37,128
	100	800	1,490	2,400	3,205	4,580	8,015	12,825	16,945	26,335	60,731
	0-76	860	1,600	2,590	3,460	4,940	8,645	13,830	18,280	28,400	65,504
175	150	490	915	1,480	1,975	2,820	4,935	7,895	10,435	16,125	37,393
	125	870	1,630	2,635	3,515	5,020	8,785	14,055	18,570	28,865	66,565
	0-87	985	1,840	2,970	3,960	5,660	9,900	15,850	20,950	32,545	75,052
200	150	840	1,600	2,540	3,390	4,840	8,470	13,550	17,900	27,830	67,238
	125	1,075	2,000	3,240	4,330	6,180	10,815	17,300	22,870	35,530	81,947
	0-103	1,125	2,100	3,390	4,520	6,460	11,300	18,000	23,900	37,145	85660
225	175	840	1,650	2,670	3,560	5,080	8,890	14,225	18,800	29,210	67320
	150	1,160	2,180	3,500	4,660	6,660	11,655	18,650	24,640	38,300	88332
	0-117	1,250	2,340	3,780	5,000	7,200	12,600	20,160	26,640	41,400	95472
250	200	925	1,730	2,790	3,720	5,320	9,300	14,900	19,680	30,600	70584
	150	1,340	2,500	4,050	5,400	7,720	13,500	21,600	28,600	44,400	102367
	0-131	1,385	2,590	4,180	5,570	7,960	13,930	22,300	29,450	45,800	105570
***273**	225	880	1,640	2,650	3,530	5,050	8,830	14,130	18,670	29,000	
	200	1,240	2,320	3,750	4,990	7,130	12,480	19,960	26,400	41,000	
	0-145	1,510	2,830	4,570	6,090	8,700	15,230	24,360	32,200	50,000	
***300**	250	920	1,720	2,780	3,700	5,290	9,250	14,800	19,600	30,400	
	225	1,250	2,330	3,770	5,020	7,170	12,550	20,100	26,500	41,300	
	0-160	1,640	3,070	4,960	6,600	9,440	16,520	26,400	34,900	54,300	

Capcaities are based on an accuracy regulation of 1 psi and with pipe sizes to insure reasonable velocities. Refer to pipe sizing chart.

* Cast steel construction required for service above 250 psi g

Capacities - pounds of saturated steam per hour for reduced port valve sizes for lower steam velocities

Inlet steam pressure psi g	Outlet steam pressure psi g	½"S	¾"S	Nominal valve size 1"S	1¼"S	1½"S	2"S	2½"S	3"S	4"S	6"S (25-Series, only)
	C.V. Factors	1.16	2.4	4.6	6.5	11.6	18.5	26	37	64	156
15	10	30	65	125	175	315	505	695	1,000	1,730	4,048
	5	45	95	175	250	450	720	1,015	1,440	2,500	6,311
	3	50	110	205	285	510	820	1,150	1,630	2,795	6,917
20	12	40	85	160	230	405	650	920	1,300	2,225	6,070
	8	50	110	210	290	520	825	1,170	1,655	2,825	7,585
	0-5	60	125	235	335	600	955	1,330	1,915	3,265	8,427
25	15	50	100	190	270	485	770	1,085	1,540	2,630	7,438
	10	65	135	255	360	640	1,025	1,435	2,040	3,550	9,144
	0-7	70	145	270	385	685	1,090	1,555	2,210	3,775	9,912
30	20	50	110	210	290	520	825	1,170	1,655	2,825	7,942
	15	75	150	290	410	735	1,175	1,660	2,350	4,000	9,808
	0-12	80	160	305	430	760	1,220	1,715	2,435	4,225	10,665
40	30	50	110	210	290	520	825	1,170	1,655	2,825	8,864
	25	85	175	335	470	835	1,360	1,870	2,665	4,640	11,017
	0-18	95	200	370	525	935	1,500	2,100	2,985	5,185	13,160
50	40	65	130	250	355	640	1,105	1,430	2,085	3,565	9,699
	30	105	220	420	585	1,045	1,670	2,350	3,330	5,825	13,936
	0-21	115	240	460	650	1,130	1,850	2,600	3,700	6,400	16,364
60	45	95	200	370	520	940	1,500	2,110	3,000	5,125	13,105
	35	125	250	475	670	1,195	1,900	2,760	3,810	6,590	16,781
	0-27	130	270	510	720	1,290	2,065	2,885	4,125	7,105	18,855
75	60	95	200	370	525	935	1,500	2,100	2,985	5,185	14,475
	50	140	290	545	775	1,380	2,210	3,155	4,475	7,655	18,666
	0-35	155	330	620	875	1,565	2,500	3,495	4,950	8,640	22,813
85	70	100	210	395	540	960	1,590	2,160	3,070	5,415	15,320
	50	165	350	655	915	1,660	2,650	3,735	5,295	9,045	23,062
	0-43	170	360	680	960	1,710	2,735	3,850	5,460	9,475	24,851
100	80	120	255	490	690	1,230	1,960	2,735	3,880	6,780	19,198
	60	190	400	755	1,080	1,900	3,050	4,315	6,140	10,600	26,542
	0-48	200	420	800	1,120	2,000	3,200	4,480	6,350	11,000	29,476

Continued on next page

Capacities - pounds of saturated steam per hour for reduced port valve sizes for lower steam velocities (continued)

Inlet steam pressure psi g	Outlet steam pressure psi g	½"S	¾"S	Nominal valve size 1"S	1¼"S	1½"S	2"S	2½"S	3"S	4"S	6"S (25-Series, only)
	C.V. Factors	**1.16**	**2.4**	**4.6**	**6.5**	**11.6**	**18.5**	**26**	**37**	**64**	**156**
125	100	145	300	585	825	1,470	2,350	3,365	4,765	8,140	23,900
	80	230	480	905	1,275	2,280	3,645	5,115	7,250	12,500	31,378
	0-62	245	510	965	1,365	2,435	3,900	5,535	7,850	13,420	35,922
150	125	160	335	645	910	1,625	2,590	3,640	5,270	9,000	26,126
	100	265	555	1,050	1490	2,645	4,230	5,930	8,415	14,650	36,170
	0-76	285	580	1,140	1,600	2,870	4,590	6,420	9,140	15,800	42,368
175	150	165	350	655	915	1,660	2,650	3,775	5,295	9,045	28,177
	125	290	600	1,160	1,630	2,915	4,665	6,550	9,285	15,900	39,252
	0-87	330	680	1,310	1,840	3,300	5,270	7,410	10,500	18,000	49,436
200	150	285	580	1,125	1,600	2,850	4,480	6,290	9,060	15,450	42,109
	125	360	740	1,420	2,000	3,570	5,725	8,015	11,350	19,700	50,199
	0-103	375	780	1,485	2,100	3,740	5,990	8,390	11,875	20,670	55,471
225	175	290	605	1,170	1,625	2,945	4,700	6,600	9,400	16,200	44,785
	150	390	810	1,540	2,180	3,885	6,200	8,715	12,350	21,300	53,605
	0-117	420	875	1,655	2,340	4,175	6,680	9,375	13,300	23,000	61,917
250	200	310	640	1,250	1,730	3,100	4,920	6,920	9,840	17,000	47,309
	150	450	935	1,775	2,500	4,465	7,155	10,000	14,200	24,700	63,991
	0-131	460	970	1,830	2,590	4,615	7,395	10,300	14,725	25,450	68,363
***275**	225	290	610	1,160	1,640	2,930	4,670	6,560	9,335	16,150	
	200	415	855	1,640	2,320	4,140	6,600	9,275	13,200	22,830	
	0-145	505	1,040	2,000	2,830	5,050	8,050	11,310	16,100	27,840	
***300**	250	310	635	1,220	1,720	3,070	4,890	6,870	9,780	18,900	
	225	415	860	1,650	2,330	4,160	6,640	9,330	13,270	22,900	
	0-160	550	1,130	2,170	3,070	5,475	8,730	12,270	17,460	30,200	

Capcaities are based on an accuracy regulation of 1 psi and with pipe sizes to insure reasonable velocities. Refer to pipe sizing chart.

* Cast steel construction required for service above 250 psi g

TI-P235-09-US
Issue 2

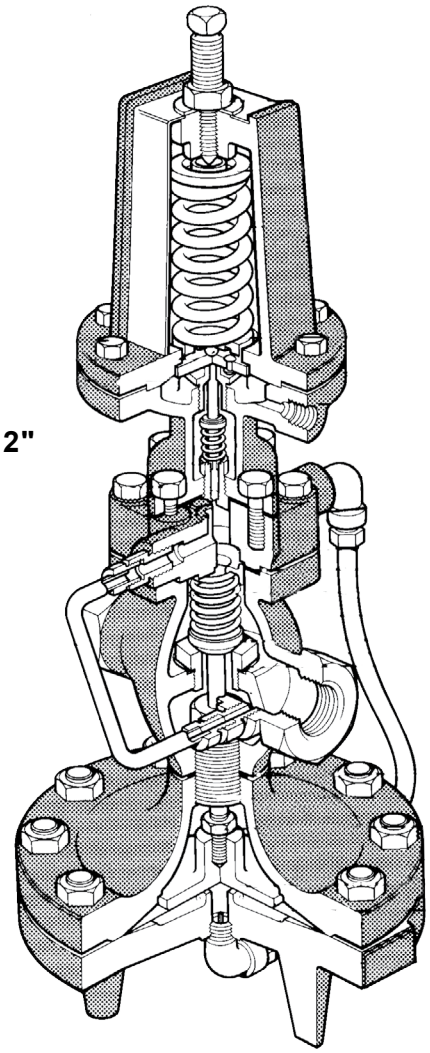
Pilot Operated Back Pressure Regulator
½" to 4" 25BP

Description

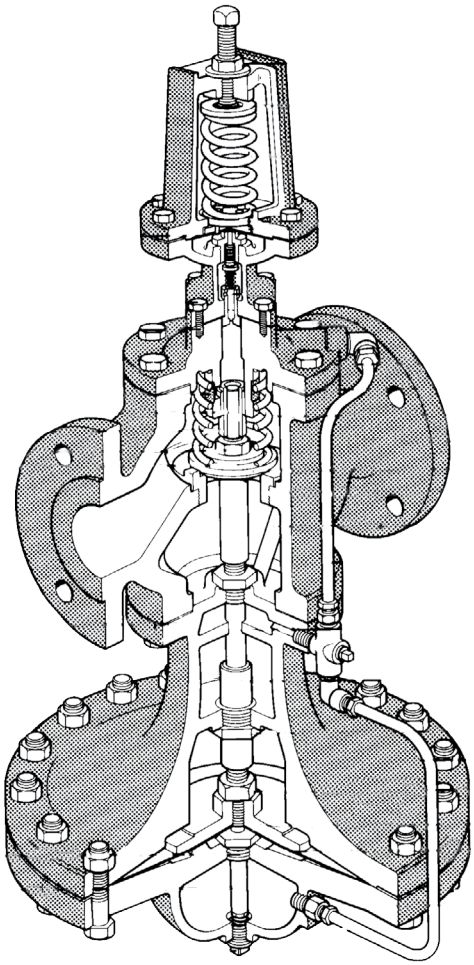
The 25BP Back Pressure Regulator maintains a constant upstream pressure in a piping system. The reverse-acting pressure pilot opens the main valve when the sensed upstream pressure increases.
The 25BP is NOT a safety valve, and should NEVER be used as such.

Model	25BP			
Sizes	½" to 2" (DN15 to DN50)	2½", 3", 4" (DN65, DN80, DN100)	½" to 2" (DN15 to DN50)	2", 2½", 3", 4" (DN50, DN65, DN80, DN100)
Connections	NPT	ANSI 125	NPT	ANSI 300
Construction	Cast iron		Cast steel	
Options		ANSI 250		ANSI 150 (excludes 2")
Transmission Tubing	Copper Tubing		Stainless Steel Tubing	

½" to 2"



2" to 4"



Typical applications

The modulated release of surplus steam ensures that the set maximum presure in the steam space or upstream piping will not be exceeded. Flash steam recovery systems to release excess flash steam limits the flash tank pressure. For elimination of non-critical loads, see TI-P717-07-US.

Limiting operating conditions

PMO	Maximum operating pressure	NPT:	250 psi g (17 bar g) @ 450 °F (232 °C)
		ANSI 125:	125 psi g (8 bar g) @ 450 °F (232 °C)
		ANSI 250:	250 psi g (17 bar g) @ 450 °F (232 °C)
		ANSI 150:	185 psi g (12 bar g) @ 450 °F (232 °C)
		ANSI 300:	300 psi g (20 bar g) @ 450 °F (232 °C)
Maximum temperating temperature			450 °F (232 °C)

Upstream pressure ranges

For the following upstream pressures, three color-coded pilot valve springs are available:

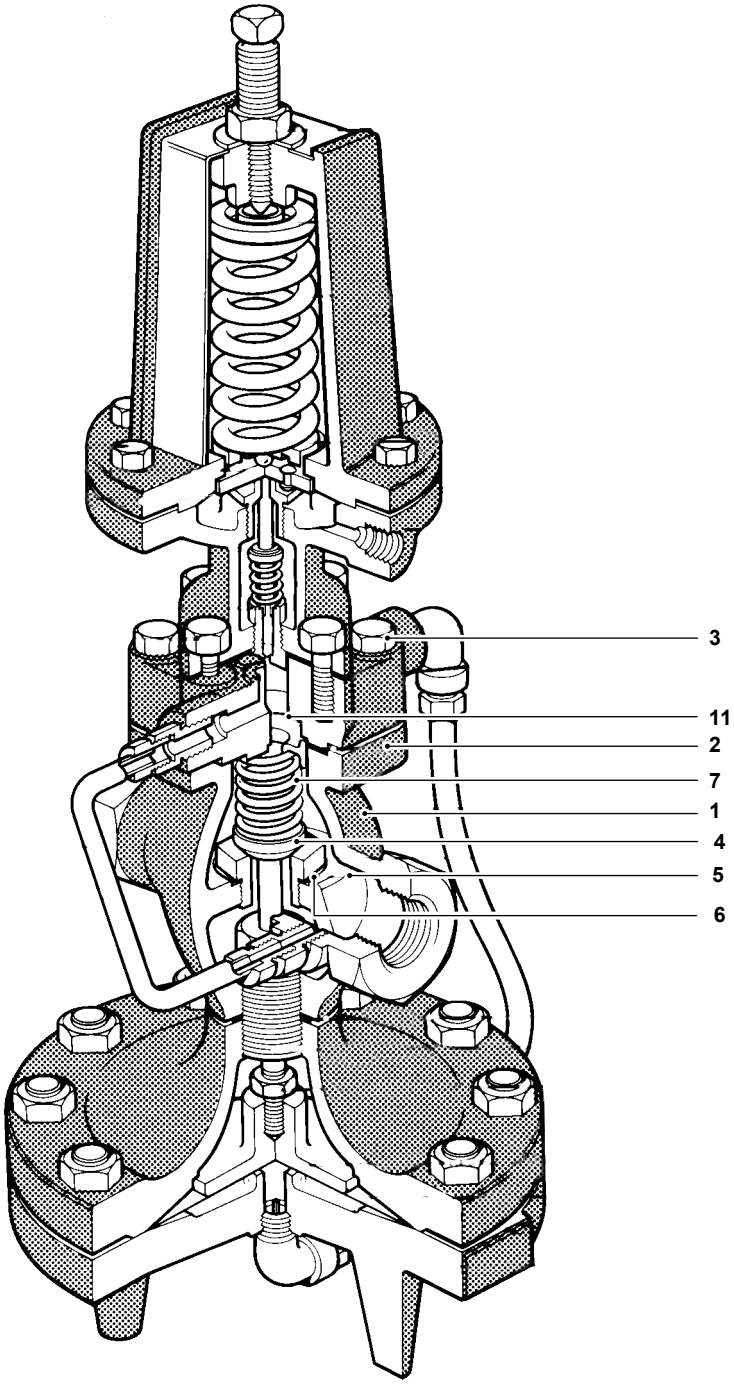
Yellow	Blue	Red
3 to 30 psi (0.2 to 2 bar)	20 to 100 psi (1.3 to 6.9 bar)	80 to 250 psi (5.5 to 17.2 bar)

Pressure shell design conditions

PMA	Maximum allowable pressure	Cast iron:	250 psi g/0-450 °F	(17 bar g/0-232 °C)
		Cast steel:	300 psi g/0-600 °F	(21 bar g/0-316 °C)
TMA	Maximum allowable temperature	Cast iron:	450 °F/0-250 psi g	(232 °C/0-17 bar g)
		Cast steel:	600 °F/0-300 psi g	(316 °C/0-21 bar g)

Materials

½" to 2"

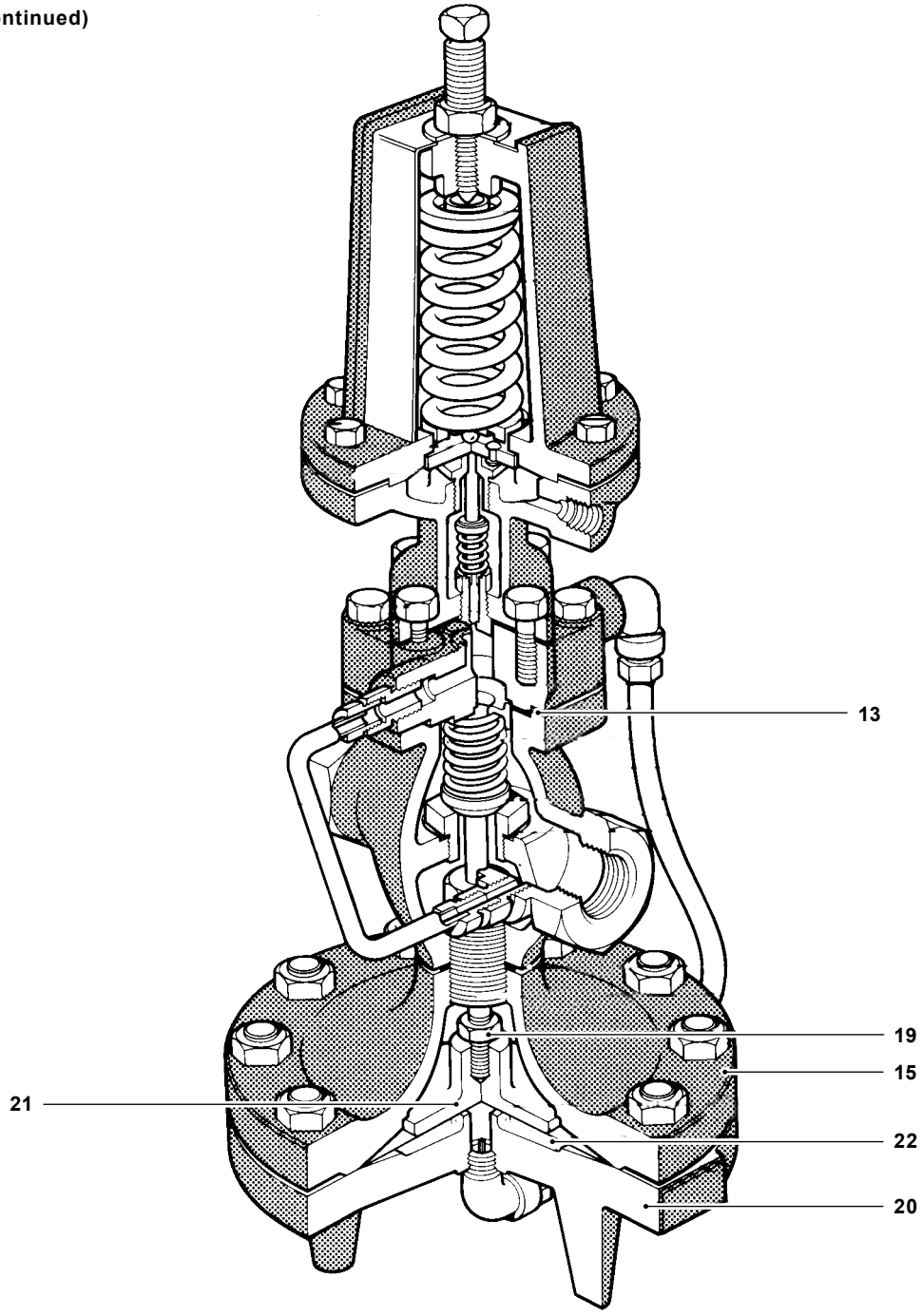


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	400 Series Stn Stl
5	Main Valve Seat	Stainless steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless steel	
11	Spring Guide	Cast iron ½"-2" (DN15 to DN50) CRS 2"* - 4" (DN50 to DN100)	

Materials continued on next page

Materials (continued)

½" to 2"

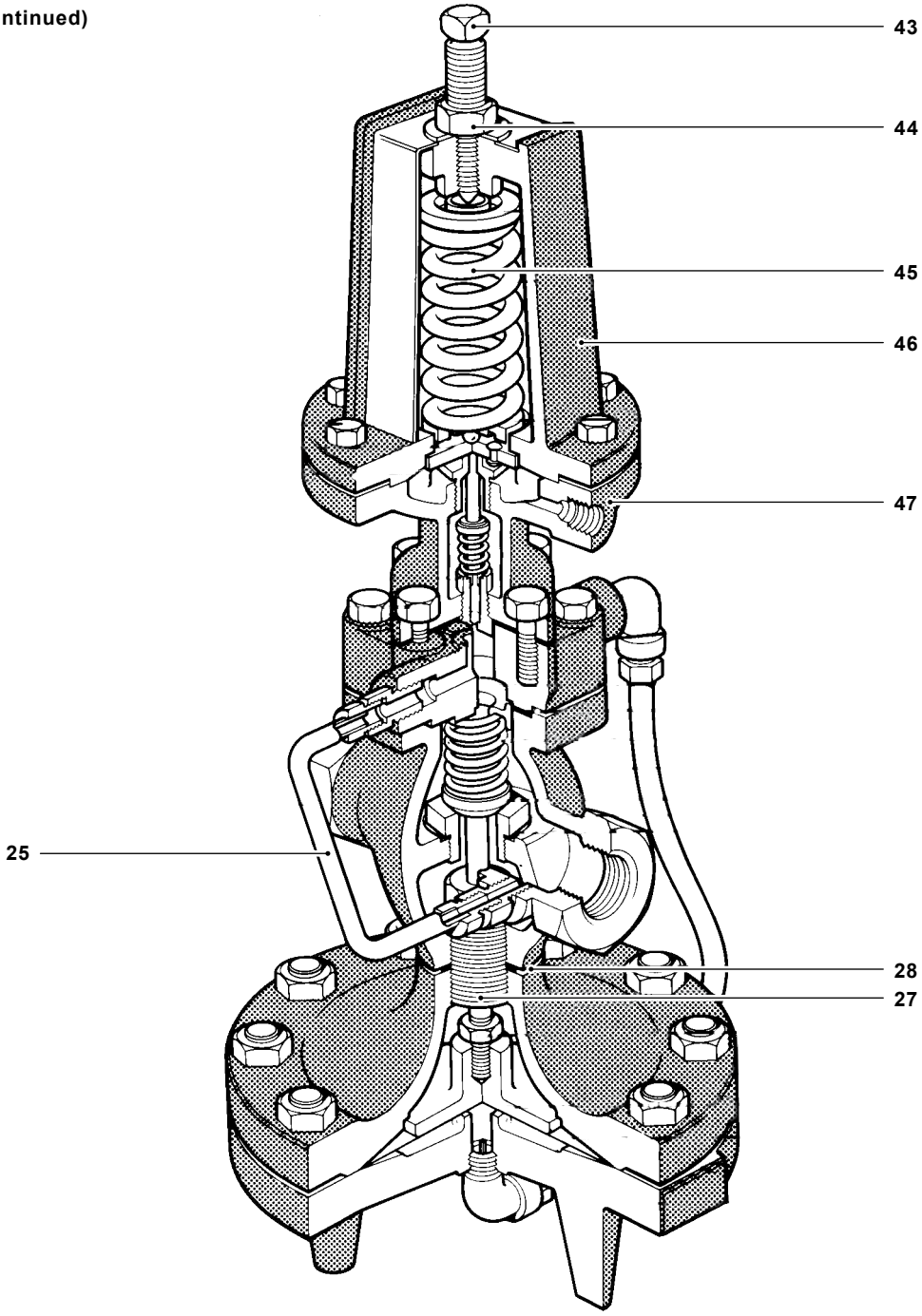


No.	Part	Material	
13	Cover Gasket	Graphite	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
19	Nut	Brass ½" - 2" (DN15 to DN50)	
		Steel 2"* - 4" (DN50 to DN100)	
20	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Brass ½" - 2" (DN15 to DN50)	
		C.I. 2"* - 4" (DN50 to DN100)	
22	Main Diaphragm (2 ply)	Stainless steel	

Materials continued on next page

Materials (continued)

½" to 2"

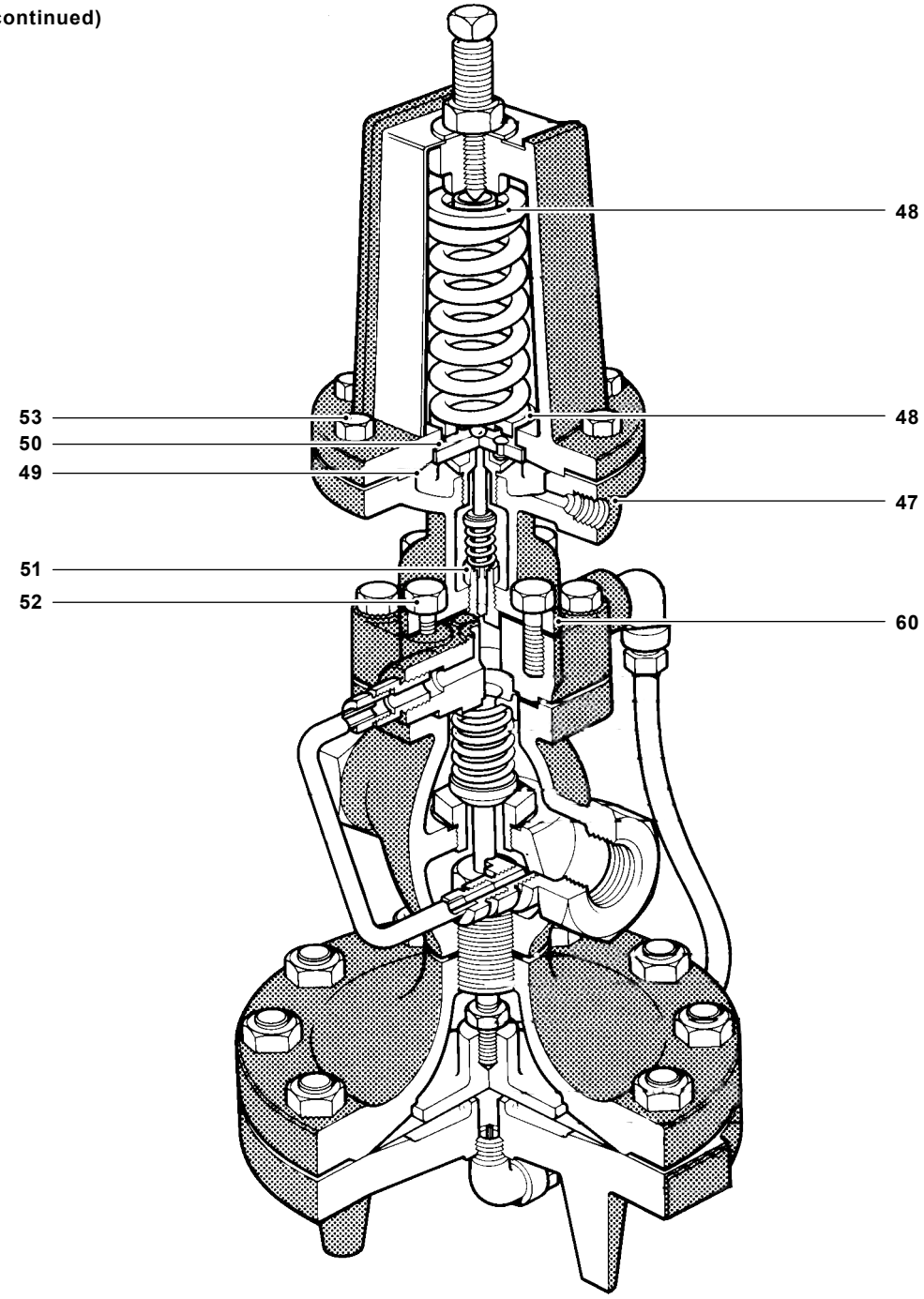


No.	Part	Material
25	Tubing Assembly Cast Iron	Copper / Brass
	Tubing Assembly Cast Steel	Stainless Steel
27	Connector Stud	Stainless steel
28	Body Gasket	½" - 2" (DN15 to DN50) Copper Clad
		2"* - 4" (DN50 to DN100) Graphite
43	Adjustment Screw	Stainless steel
44	Jam Nut	Brass
45	Pilot Valve Spring	Steel
46	Upper Diaphragm Case	Cast iron
		Cast steel

Materials continued on next page

Materials (continued)

½" to 2"

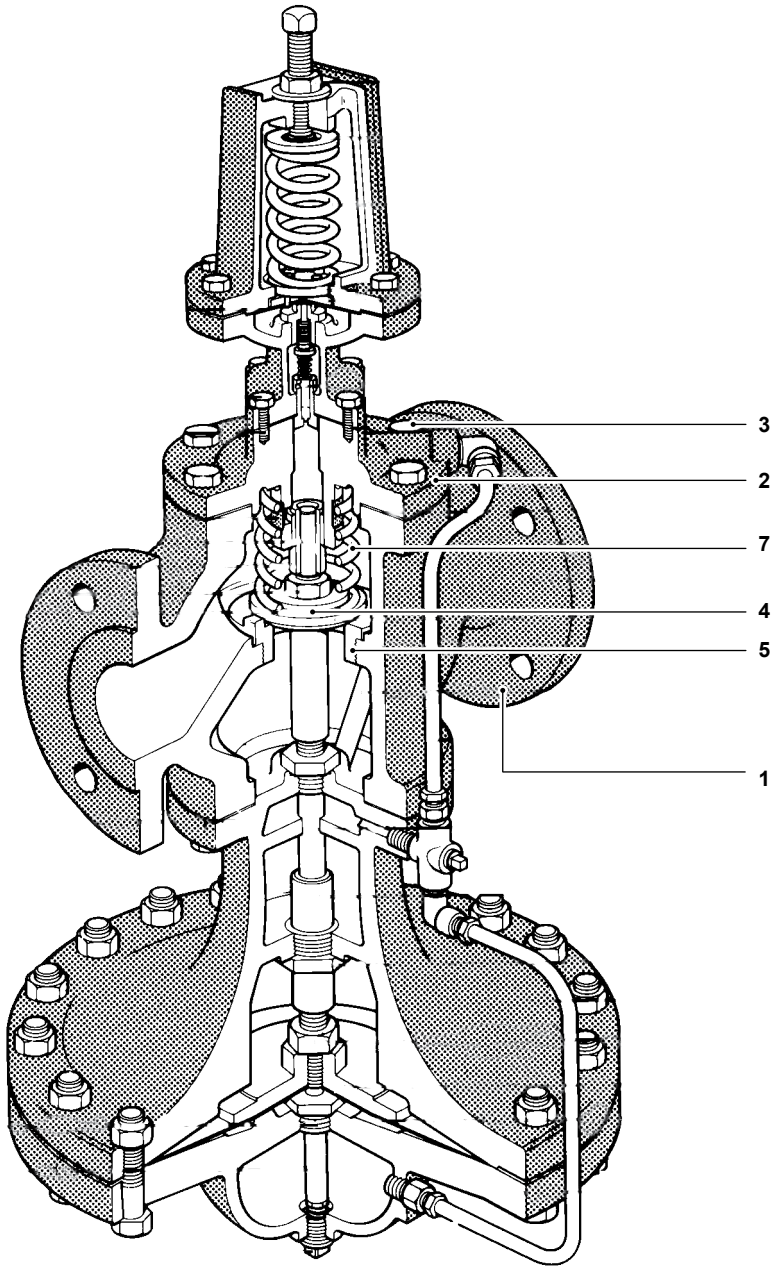


No.	Part	Material	
47	Lower Diaphragm Case	Cast iron	
		Cast steel	
48	Spring Plate	Steel	ASTM A569
49	Diaphragm	Stainless steel	
50	Diaphragm Plate	Brass	
51	Head and Seat assembly	Stainless steel	
		Stainless steel	
52	Pilot Mounting Screws	Steel	ASTM A449
53	Diaphragm case screws	Steel	
60	Pilot Gasket	Graphite	

Materials

2"* to 4"

*ANSI 300 ONLY



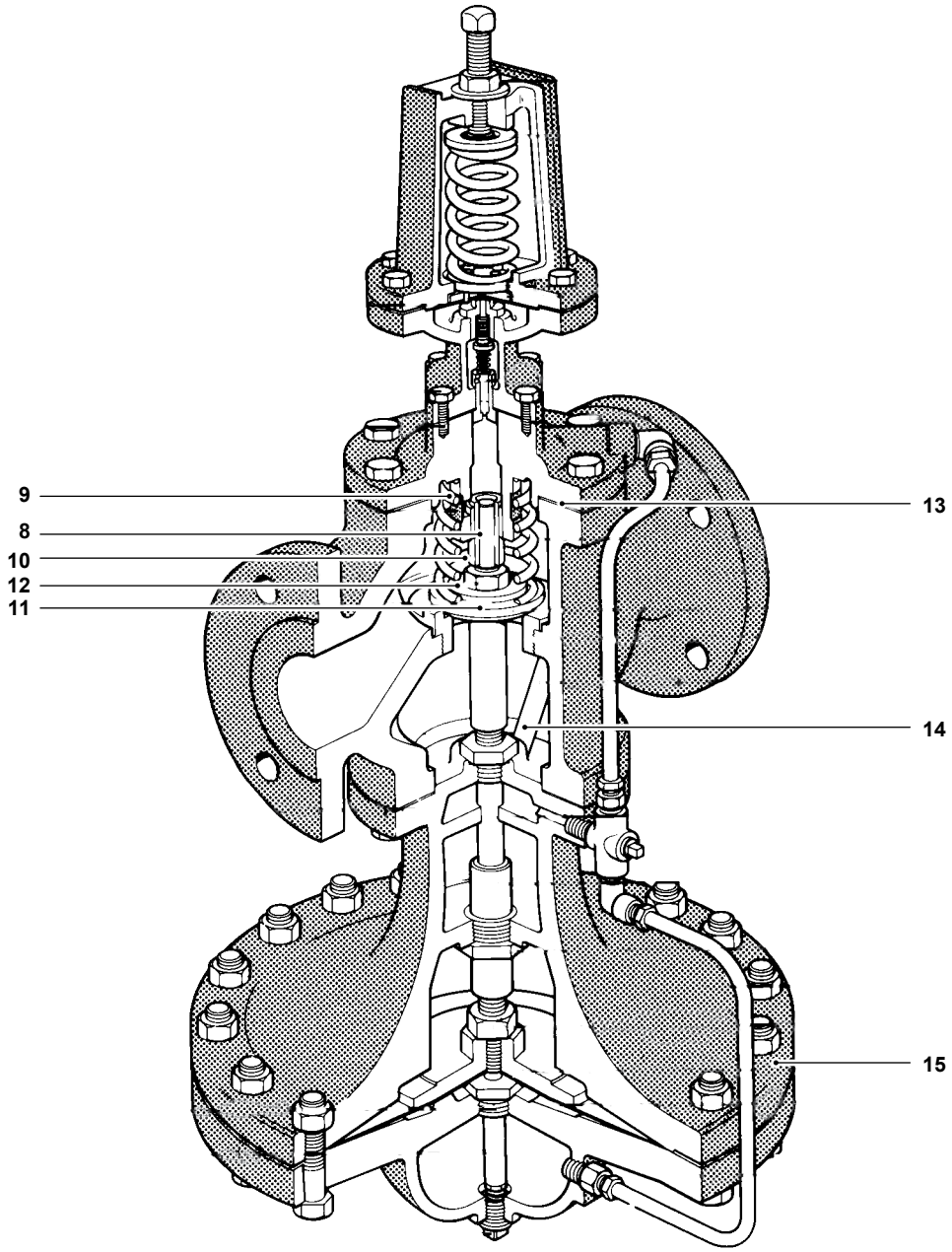
No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	400 Series Stn Stl
5	Main Valve Seat	Stainless steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless steel	

Materials continued on next page

Materials (continued)

2"* to 4"

*ANSI 300 ONLY



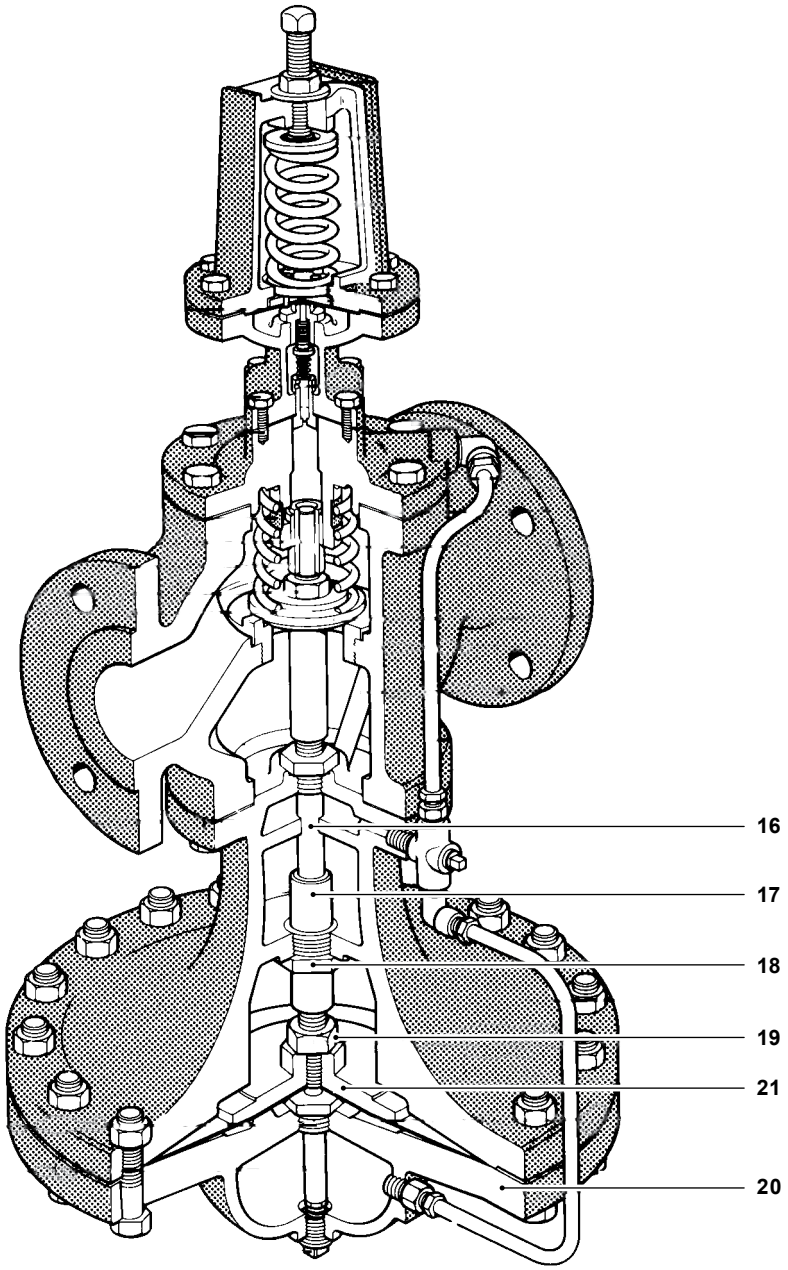
No.	Part	Material	
8	Valve Stem	Stainless steel	
9	Strainer Screen	Stainless steel	
10	Valve Stem Sleeve	Stainless steel	
11	Spring Guide	Cast iron ½"-2" (DN15 to DN50) CRS 2"* - 4" (DN50 to DN100)	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless steel	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB

Materials continued on next page

Materials (continued)

2"* to 4"

*ANSI 300 ONLY



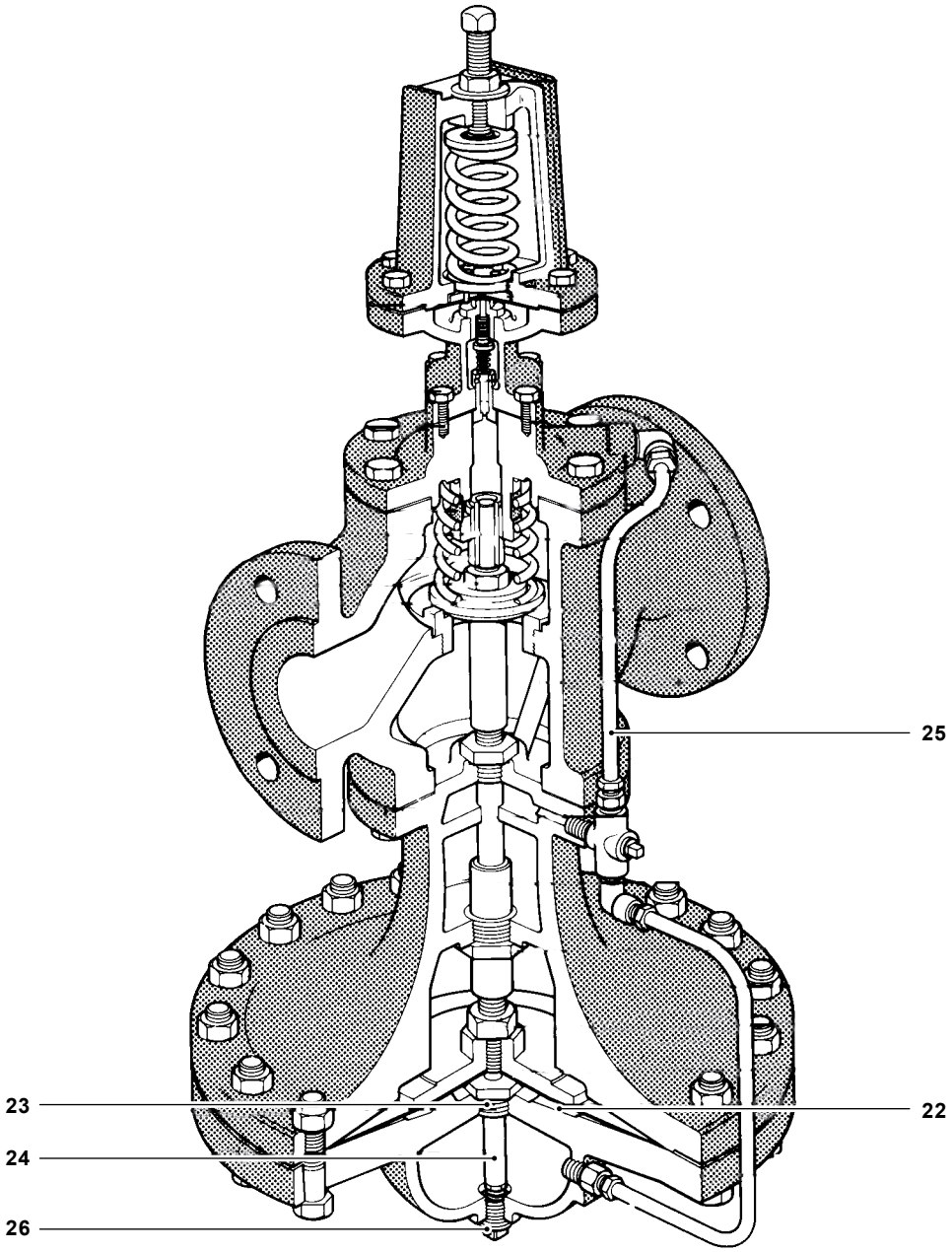
No.	Part	Material	
16	Stem Bushing (2½" - 4" (DN65 to DN100) Cast steel only)	Stainless steel	
17	Diaphragm Plate Stem	Stainless steel	
18	Diaphragm Stem Guide	Stainless steel	
19	Nut	Brass ½" - 2" (DN15 to DN50)	
		Steel 2"* - 4" (DN50 to DN100)	
20	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Brass ½" - 2" (DN15 to DN50)	
		C.I. 2"* - 4" (DN50 to DN100)	

Materials continued on next page

Materials (continued)

2"* to 4"

*ANSI 300 ONLY



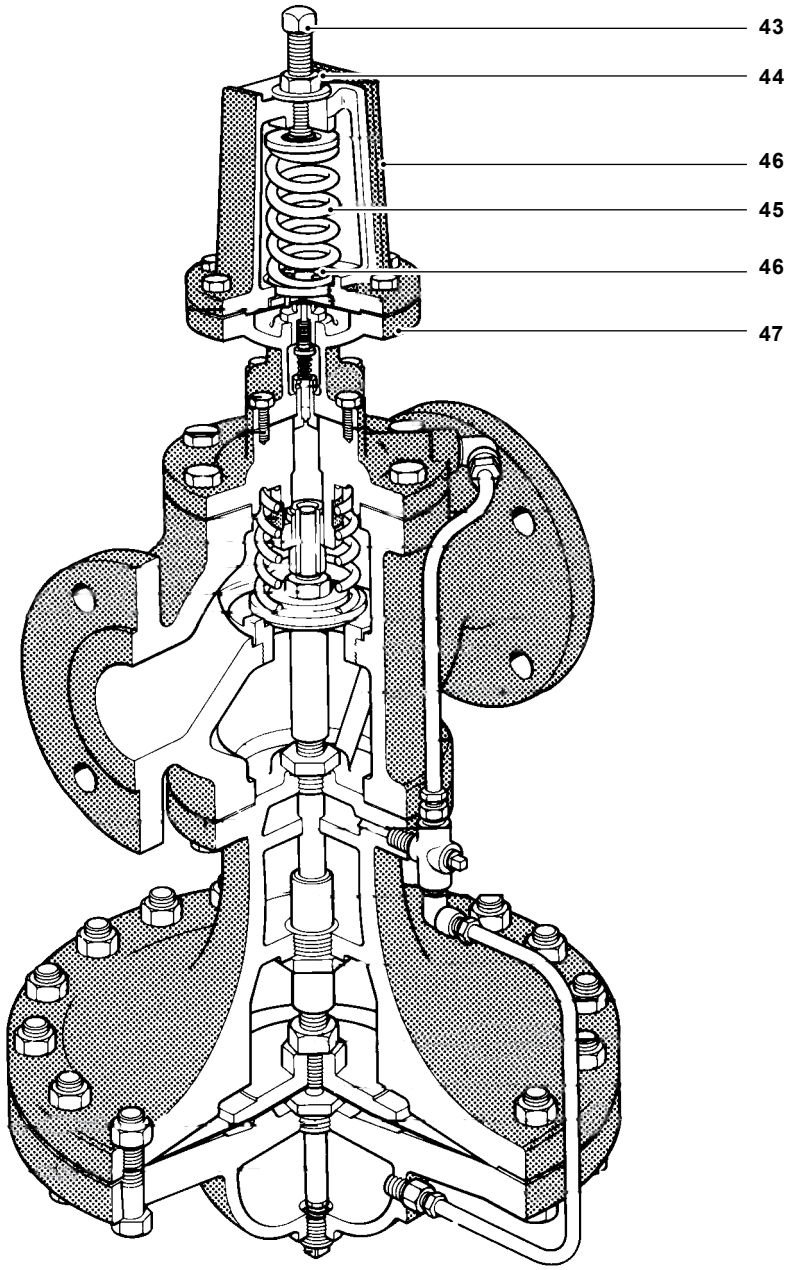
No.	Part		Material
22	Main Diaphragm (2 ply)		Stainless steel
23	Bushing		CRS
24	Tube & Orifice		Brass
25	Tubing Assembly Cast Iron		Copper / Brass
	Tubing Assembly Cast Steel		Stainless Steel
26	Plug	(Cast iron)	Brass
		(Cast steel)	Steel

Materials continued on next page

Materials (continued)

2"* to 4"

*ANSI 300 ONLY



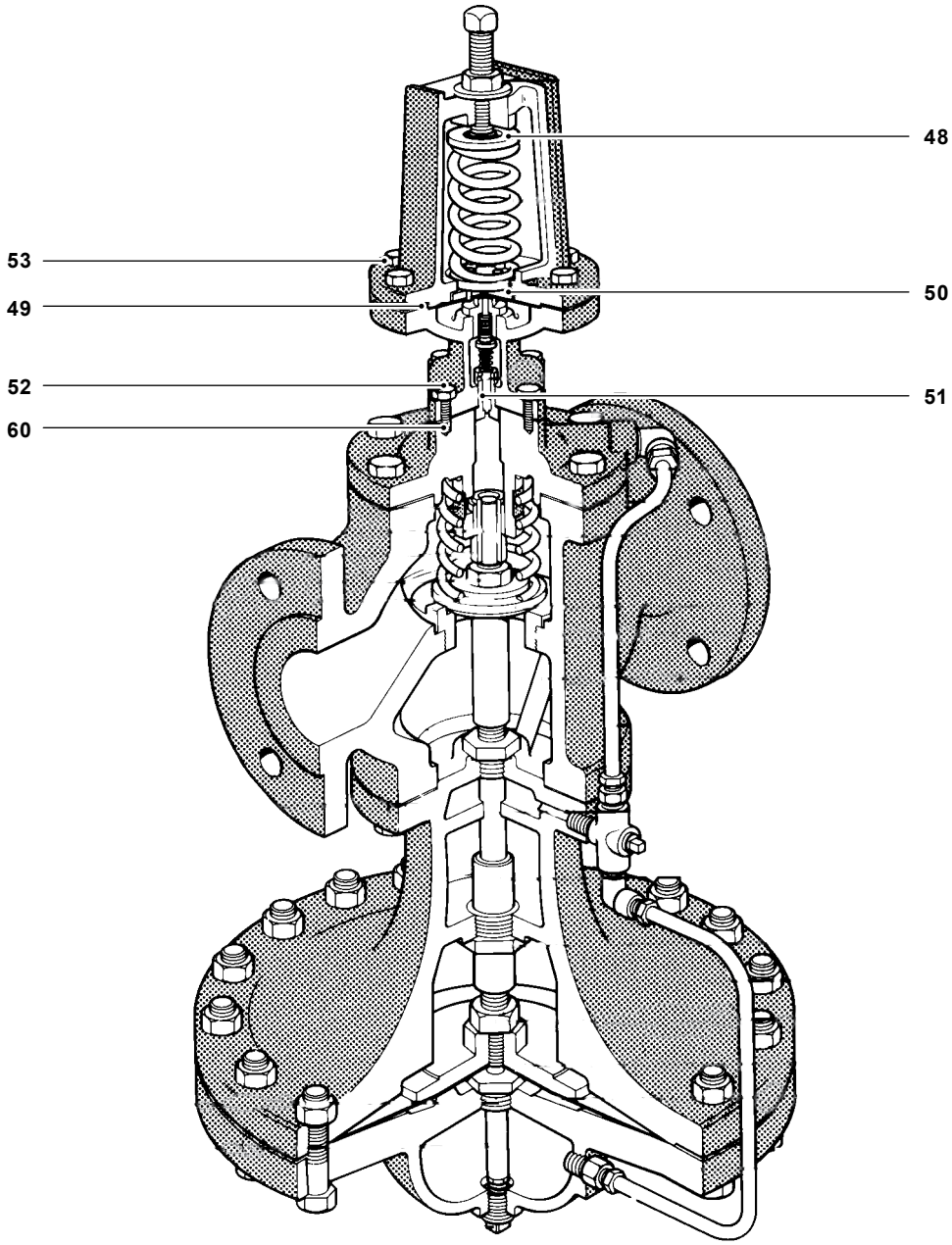
No.	Part	Material
43	Adjustment Screw	Stainless steel
44	Jam Nut	Brass
45	Pilot Valve Spring	Steel
46	Upper Diaphragm Case	Cast iron
		Cast steel
47	Lower Diaphragm Case	Cast iron
		Cast steel

Materials continued on next page

Materials (continued)

2"* to 4"

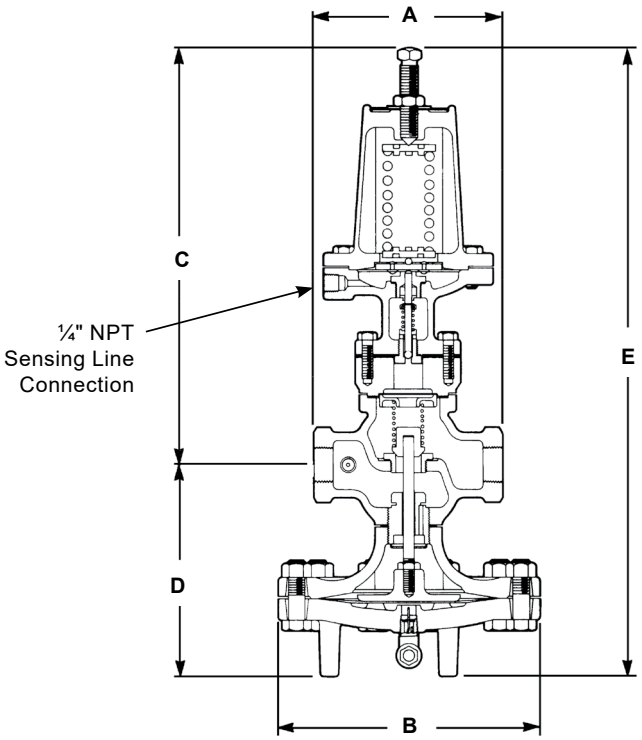
*ANSI 300 ONLY



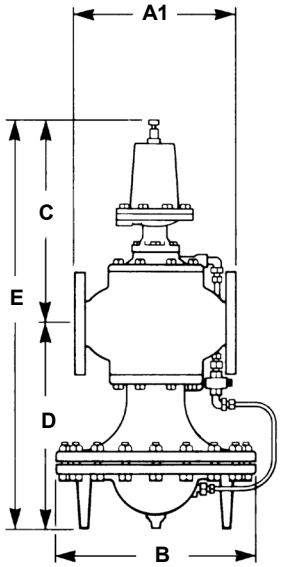
No.	Part	Material	
48	Spring Plate	Steel	ASTM A569
49	Diaphragm	Stainless steel	
50	Diaphragm Plate	Brass	
51	Head and Seat assembly	Stainless steel	
		Stainless steel	
52	Pilot Mounting Screws	Steel	ASTM A449
53	Diaphragm case screws	Steel	
60	Pilot Gasket	Graphite	

Materials continued on next page

Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)



½" to 2"



2"* to 4"

		ANSI 125	ANSI 250 ANSI 300					Weight	
Size	**A**	**A1**	**A1**	**B**	**C**	**D**	**E**	**Cast iron**	**Cast steel**
½", ¾"	5.5	–	–	7.6	12.2	6.2	18.4	32 lb	35 lb
	(140)	–	–	(193)	(310)	(157)	(467)	(14.5 kg)	(15.9 kg)
1"	6.0	–	–	8.6	12.1	6.75	18.9	39 lb	43 lb
	(152)	–	–	(219)	(308)	(171)	(480)	(17.7 kg)	(19.5 kg)
1¼", 1½"	7.25	–	–	8.6	12.7	7.1	19.75	44 lb	48 lb
	(184)	–	–	(219)	(323)	(180)	(502)	(20 kg)	(21.8 kg)
2"	8.5	–	9.0	10.6	13.3	8.2	21.5	69 lb	75 lb
	(216)	–	(229)	(270)	(338)	(208)	(546)	(31.3 kg)	(34 kg)
2½"	–	10.9	11.5	13.6	14.0	13.9	27.9	157 lb	171 lb
	_	(276)	(292)	(346)	(356)	(353)	(709)	(71.2 kg)	(77.6 kg)
3"	–	11.75	12.5	13.6	13.9	14.4	28.4	188 lb	205 lb
	–	(298)	(318)	(346)	(353)	(365)	(721)	(85.3 kg)	(93 kg)
4"	–	13.9	14.5	15.6	15.25	16.1	31.4	284 lb	309 lb
	–	(353)	(368)	(397)	(387)	(409)	(797)	(129 kg)	(140 kg)

Capacities:
For selection and sizing data, see TI-P717-07-US.

Installation
The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The pressure sensing line should be located either in the upstream piping, or in the steam space. Complete installation instructions are given in IM-3-023-US.

Maintenance
Complete installation and maintenance instructions are given in IM-3-023-US, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

Sample specification
The back pressure regulator shall be of the pilot-actuated, diaphragm-operated type. The main valve shall be single seated with hardened stainless steel trim; the valve body shall be cast iron (cast steel). The pilot shall be bolted directly to the valve body.

Standard Transmission tubing for Cast Iron Valve will be Copper with Brass fittings.

Standard Transmission tubing for Cast Steel Valve will be Stainless Steel.

If a different material is required order the Spare Part Kit

Stainless Steel Transmission Tubing Kits

Item #	Size	Description
71464	½", ¾"	Kit, ½"-¾", 25 Valve, Stainless Steel, Transmission tubing
71465	1"	Kit, 1", 25 Valve, Stainless Steel, Transmission tubing
71466	1¼", 1½"	Kit, 1¼"-1½", 25 Valve, Stainless Steel, Transmission tubing
71467	2"	Kit, 2", 25 Valve, Stainless Steel, Transmission tubing
71468	2½"	Kit, 2½", 25 Valve, Stainless Steel, Transmission tubing
71469	3"	Kit, 3", 25 Valve, Stainless Steel, Transmission tubing
71470	4"	Kit, 4", 25 Valve, Stainless Steel, Transmission tubing

Copper Tubing Transmission Line Kits

Item #	Size	Description
57302	½", ¾"	Transmission tubing kit, ½"-¾", 25 Valve
57303	1"	Transmission tubing kit, 1", 25 Valve
57304	1¼", 1½"	Transmission tubing kit, 1¼"-1½", 25 Valve
57305	2"	Transmission tubing kit, 2", 25 Valve
58010	2½"	Transmission tubing kit, 2½", 25 Valve
58011	3"	Transmission tubing kit, 3", 25 Valve
58012	4"	Transmission tubing kit, 4", 25 Valve

TI-P235-10-US
Issue 1

Pilot Operated Back Pressure Regulator 6" 25BP

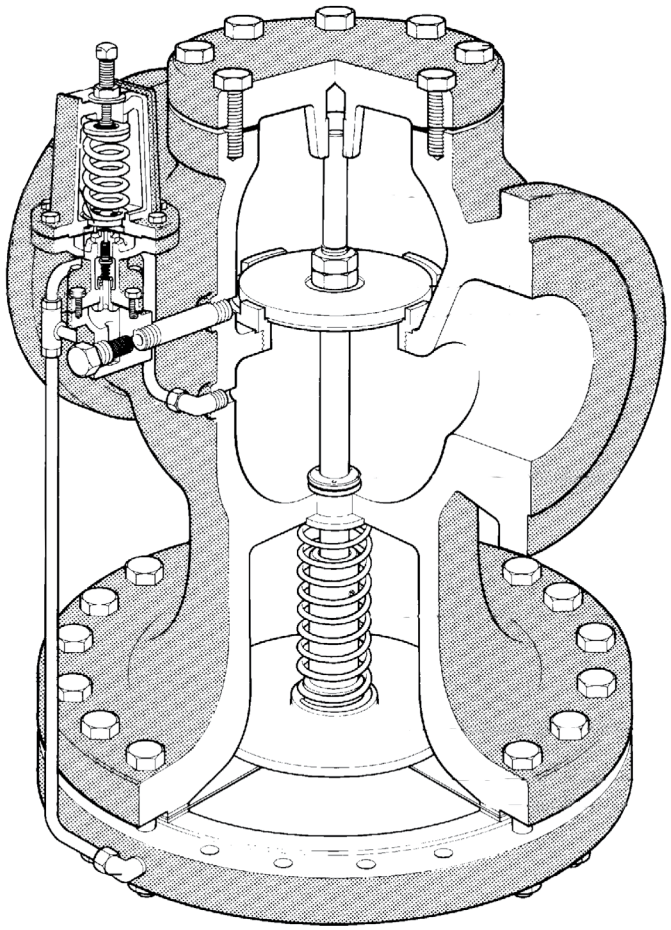
Description

The 25BP Back Pressure Regulator maintains a constant upstream pressure in a piping system. The reverse-acting pressure pilot opens the main valve when the sensed upstream pressure increases. The valve meets Class IV shut-off specifications but is not suitable for dead-end service. The 25BP is NOT a safety valve and should NEVER be used as such.

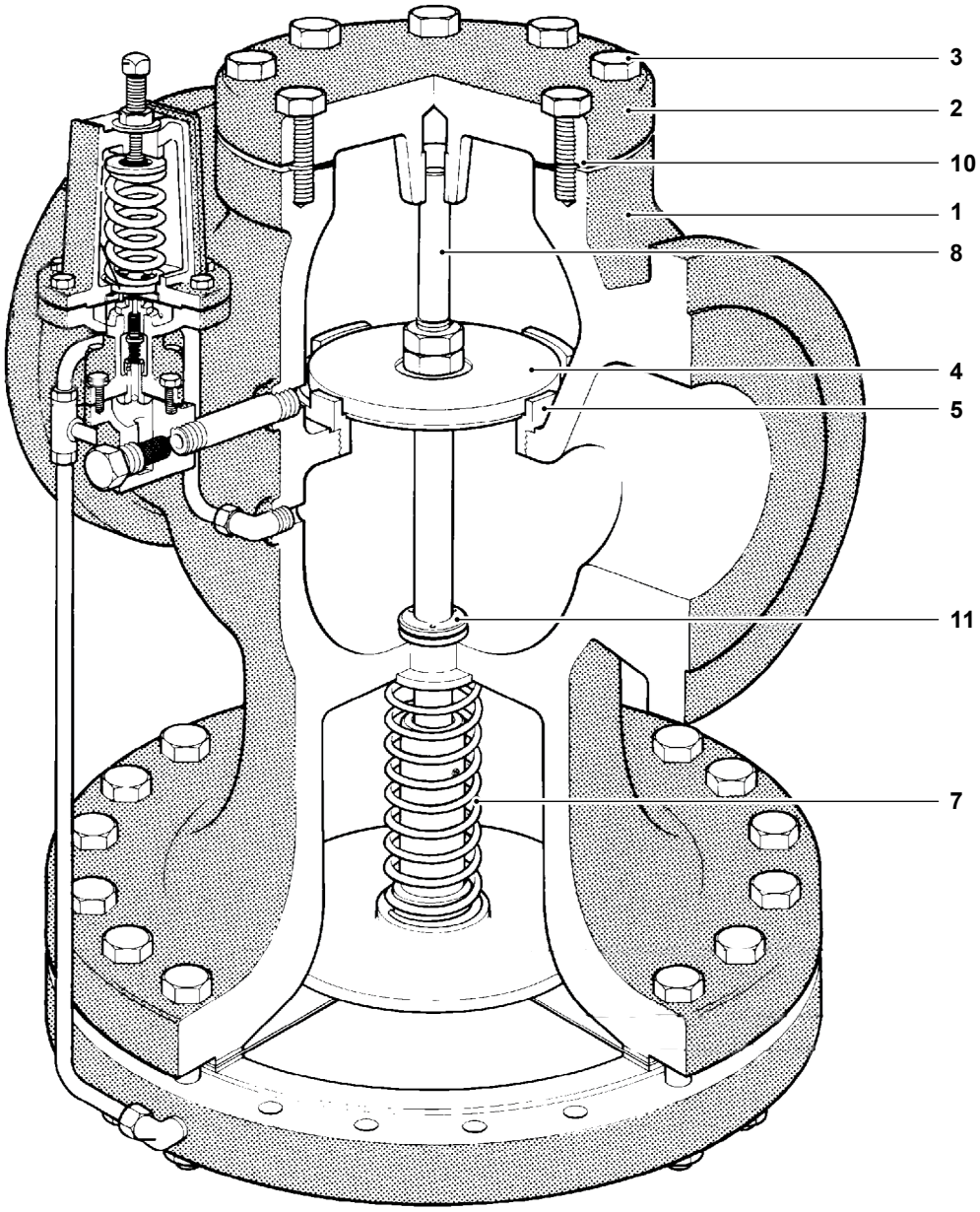
Typical applications

The modulated release of surplus steam so as to ensure that the set maximum pressure in the steam space or upstream piping will not be exceeded. Flash steam recovery systems to release excess flash steam so as to limit the flash tank pressure. For elimination of non-critical loads, see TI-P717-07-US

Model	**25BP**	
PMO	250 psi g (17 bar g)	
Sizes	6" (DN150)	
Connections	ANSI 125, 250	ANSI 150, 300
Construction	Cast iron	Cast steel
Options	Reduced Orifice Designated by "S"	

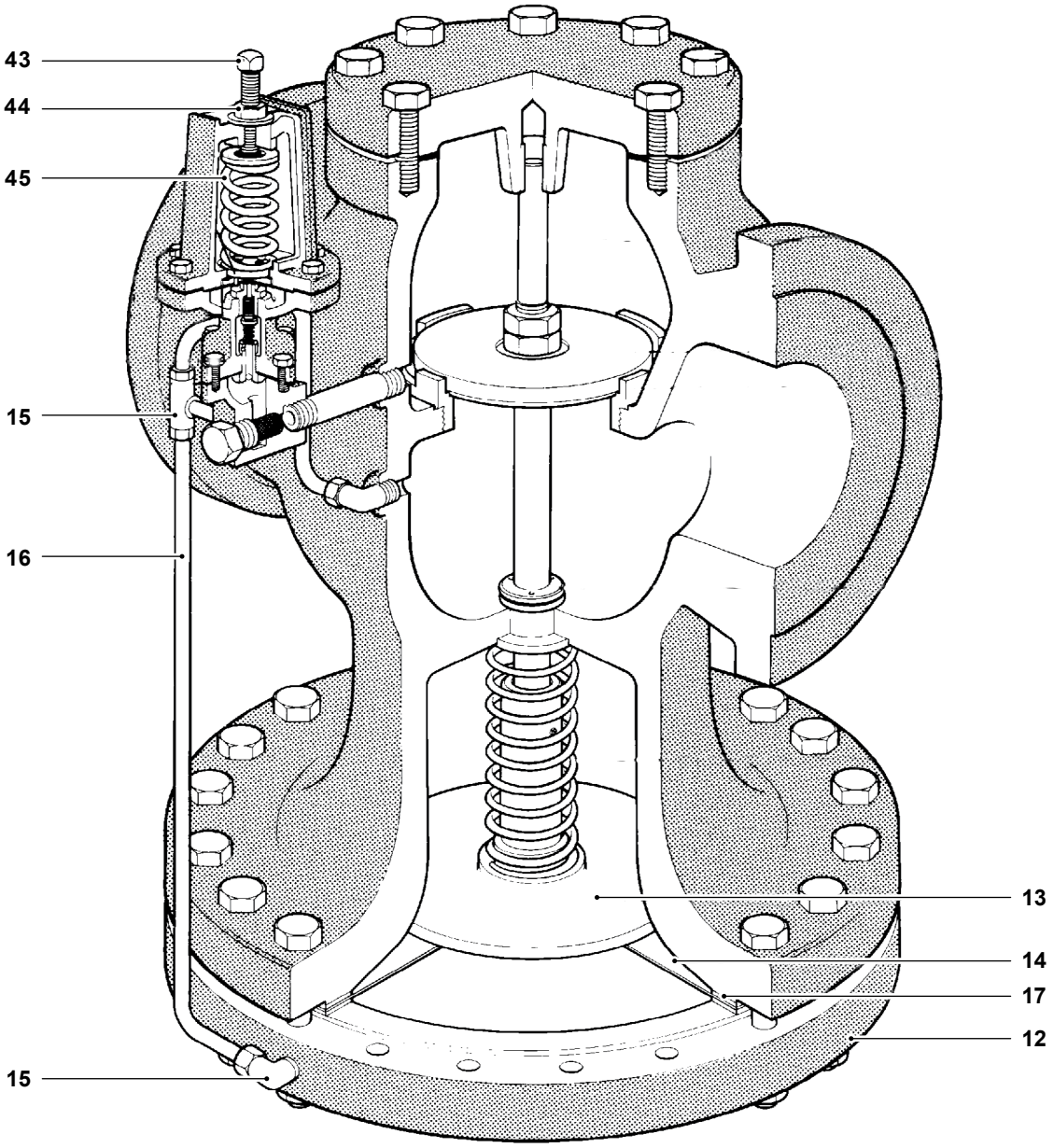


Materials



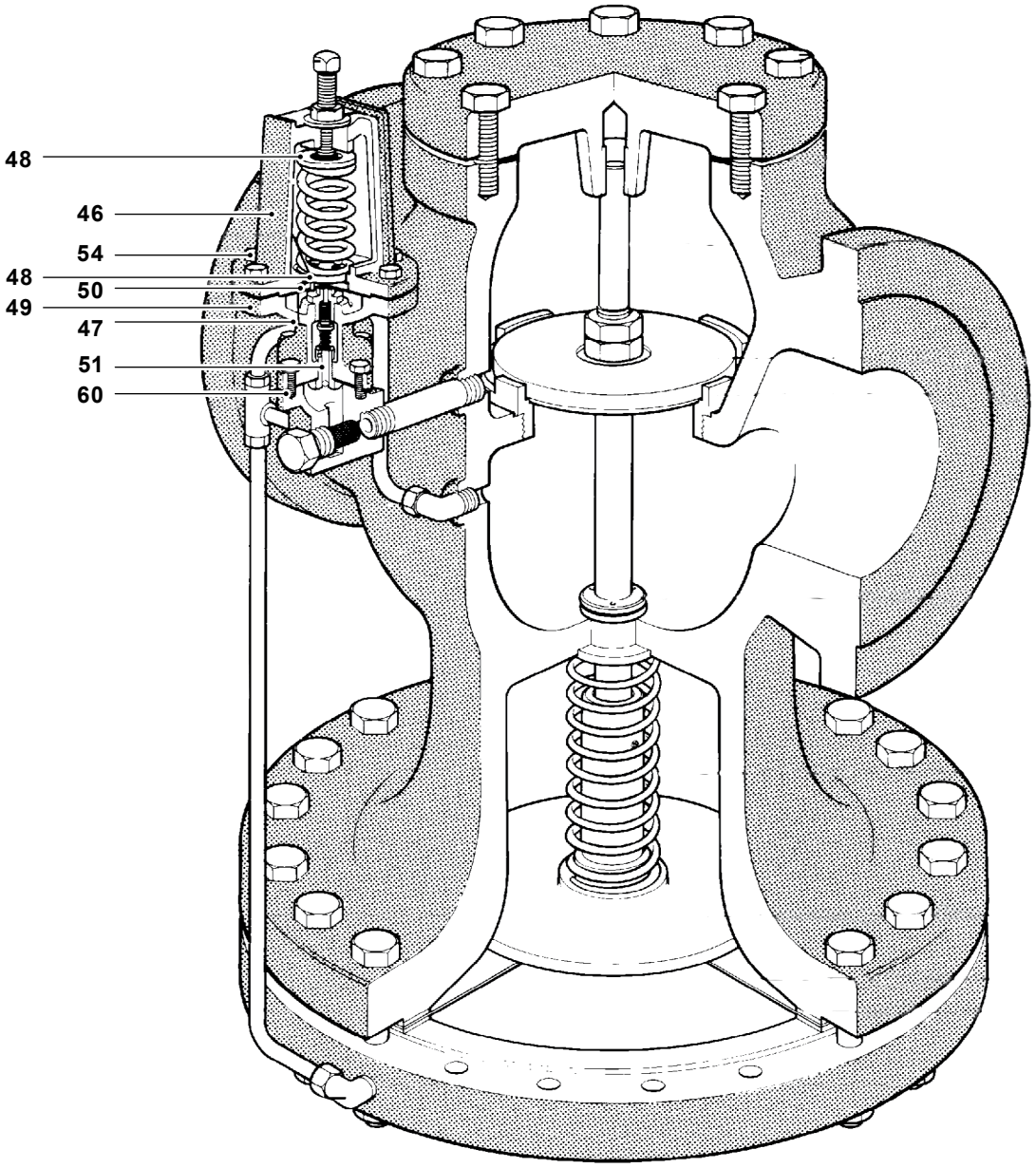
No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
3	Cover Bolts	Steel	AISI 1038
4	Main Valve Head	Stainless steel	ASTM A 743 CA 40
5	Main Valve Seat	Stainless steel	ASTM A 743 CA 40
7	Valve Return Spring	Stainless steel	AISI 302
8	Valve Stem	Stainless steel	AISI 304
10	Cover Gasket	Graphite	BS 2815 A
11	Stem Bushing	Brass	ASTM B16

Materials (continued)



No.	Part	Material	
12	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
13	Diaphragm Plate	Stainless steel	ASTM A 743 CA 40
14	Main Diaphragm (2 ply)	Stainless steel	ASTM A240
15	Tube & Orifice	Brass	ASTM B16
16	Tubing Assembly	Copper	ASTM B280 (122)
17	Diaphragm Gasket (2)	Graphite	BS 2815 A
43	Adjustment Screw	Stainless steel	AISI 304
44	Jam Nut	Brass	ASTM B16
45	Pilot Valve Spring	Steel	AISI 1060

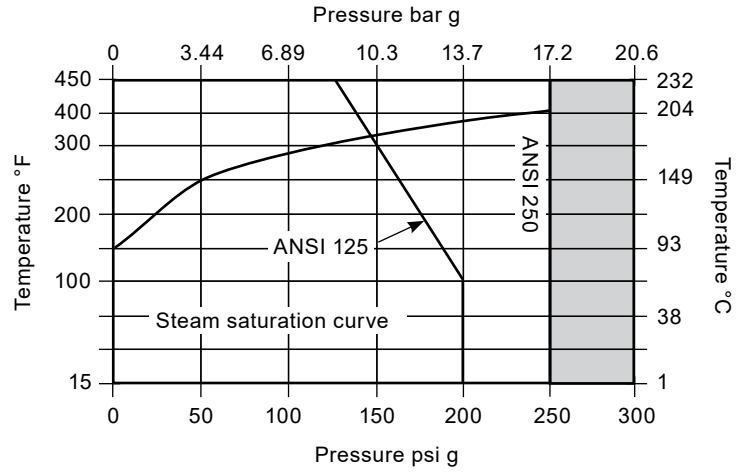
Materials (continued)



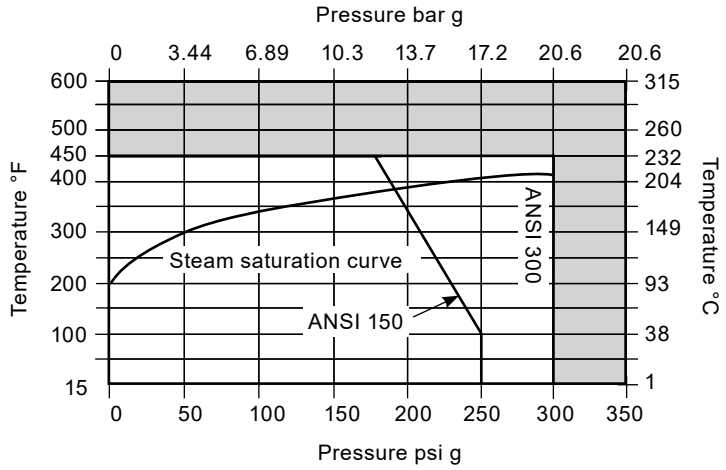
No.	Part	Material	
46	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
47	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
48	Spring Plate	Steel	ASTM A569
49	Diaphragm	Stainless steel	ASTM A240
50	Diaphragm Plate	Brass	ASTM B36
51	Head & Seat Assembly	Stainless steel	AISI 440
		Stainless steel	AISI 440F
54	Diaphragm Case Screws	Steel 5/16" - 18 x 1"	ASTM A449
60	Pilot Gasket	Graphite	

Limiting operating conditions

Cast iron



Cast steel



The product **should not** be used in shaded area.

Upstream pressure ranges

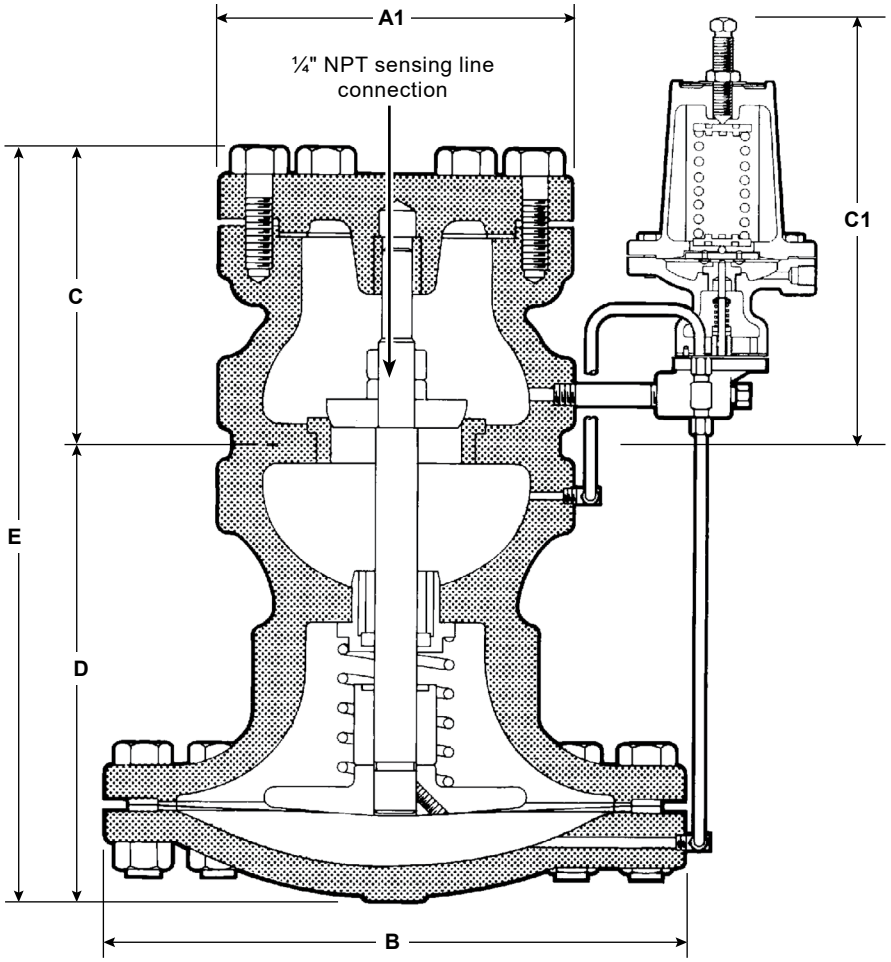
For the following upstream pressures, three color-coded pilot valve springs are available:

Yellow	Blue	Red
3 to 30 psi (0.21 to 2.1 bar)	20 to 100 psi (1.4 to 6.9 bar)	80 to 250 psi (5.5 to 17.2 bar)

Cv Values

Size	6"	6" "S"
Cv value	280	156

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Size	ANSI 125/150 A1	ANSI 250/300 A1	B	C	C1	D	E	Weight
6"	18.1 (459)	18.9 (481)	19.75 (502)	9.2 (233)	11.4 (289)	17.1 (435)	28.5 (724)	595 lb (270 kg)

Capacities

For selection and sizing data, see TI-P717-07-US.

Sample specification

The back pressure regulator shall be of the pilot-actuated, diaphragm-operated type. The main valve shall be single seated with hardened Stainless steel trim; the valve body shall be Cast iron

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer separator set. The pressure sensing line should be located either in the upstream piping, or in the steam space. Complete installation instructions are given in IM-3-023-US.

Maintenance

Complete installation and maintenance instructions are given in IM-3-023-US and ADVP 3029, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P335-11-US and TI-P717-08-US.

TI-P717-07-US
Issue 1

Sizing and Selection Chart 25BP and 26BP

The data required to size the valve are identical to those required for a pressure reducing valve, i.e. upstream pressure, downstream pressure and capacity.

Valve sizing depends upon the application.

As a flash steam surplussing valve

1. To size a Spirax Sarco 25BP or 26BP Back Pressure Regulator properly, determine the maximum probable pounds of flash steam that will be generated within the flash tank.

The amount of flash can be calculated from the table overleaf. To this add approximately 20% as a safety factor for errors in calculating the load and/or possible future growth.

2. Determine the minimum amount of low pressure steam that will be used. If at times there is no demand for low pressure steam, then the back pressure regulator must be sized for the total amount of flash steam generated in the tank plus 20% safety factor. Where there is a definite minimum amount of low pressure steam used at all times, this amount of flash steam should be subtracted from the total flash steam generated and the regulator sized for the surplus amount.

Example:
Suppose the high pressure system is operating at 125 psi, the amount of steam used at this pressure is 10,000#/hr and it is desired to keep the flash tank at 5 psi.
Under these conditions, 13.4% of the 10,000#/hr (1340#/hr of flash steam) will be generated in the flash tank.
If there is no demand for the low pressure steam at times, then the regulator must be sized for the 1340#/hr plus 20% or approximately 1600#.hr.
If there is a constant demand for 500#/hr of low pressure steam at 5 psi, then the regulator should be sized to vent the difference between 1600 and 500 or 1100#/hr.

Eliminating non-critical loads

For this application, a 25BP or 26BP valve must be sized for the minimum allowable pressure drop to insure that the valve is normally fully open. Select valve size with load capacity at the minimum pressure drop on the 25P capacity table given in TI-P717-08.

A combination P-BP regulator must be sized using the inlet and reduced pressure the same as for a 25P pressure reducing valve. For a combination T-BP regulator size the same as a 25T temperature control.

Surplussing valve capacities pounds of saturated steam per hour to atmosphere

Inlet steam pressure psi g	Nominal valve size									
	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"
C.V. Factors	**3.48**	**6.5**	**10.5**	**14**	**20**	**35**	**56**	**74**	**115**	**280**
2	45	85	140	180	260	455	725	960	1,490	
3	55	105	170	225	320	560	900	1,185	1,840	
5	75	135	215	290	415	725	1,160	1,530	2,380	
10	110	210	335	445	640	1,120	1,790	2,360	3,675	
15	150	275	445	590	845	1,480	2,365	3,130	4,860	11,220
20	180	335	540	720	1,025	1,795	2,870	3,790	5,895	13,592
25	205	385	620	825	1,180	2,065	3,305	4,360	6,785	15,647
30	230	430	695	925	1,320	2,310	3,695	4,885	7,590	17,503
40	280	525	850	1,135	1,620	2,835	4,535	5,995	9,315	21,481
50	350	650	1,050	1,400	2,000	3,500	5,600	7,400	11,500	26,520
60	385	720	1,165	1,555	2,220	3,885	6,215	8,215	12,765	29,437
75	460	875	1,415	1,890	2,700	4,725	7,560	9,990	15,525	35,802
100	600	1,120	1,815	2,420	3,460	6,055	9,690	12,800	19,895	45,900
125	730	1,365	2,200	2,940	4,200	7,350	11,760	15,540	24,150	55,692
150	860	1,600	2,590	3,460	4,940	8,645	13,830	18,280	28,400	65,504
175	985	1,840	2,970	3,960	5,660	9,900	15,850	20,950	32,545	75,052
200	1,125	2,100	3,390	4,520	6,460	11,300	18,000	23,900	37,145	85,660
250	1,385	2,590	4,180	5,570	7,960	13,930	22,300	29,450	45,800	105,570
***300**	1,640	3,070	4,960	6,600	9,440	16,400	26,400	34,900	53,300	

* Cast steel construction required for service above 250 psi g

Percent flash

Percent flash for various initial steam pressures and flash tank pressures

Steam pressure psi g	Flash tank pressure, psi g										
	0	2	5	10	15	20	30	40	60	80	100
5	1.7	1.0	0								
10	2.9	2.2	1.4	0							
15	4.0	3.2	2.4	1.1	0						
30	6.5	5.8	5.0	3.8	2.6	1.7	0				
40	7.8	7.1	6.4	5.1	4.0	3.1	1.3	0			
60	10.0	9.3	8.6	7.3	6.3	5.4	3.6	2.2	0		
80	11.7	11.1	10.3	9.0	8.1	7.1	5.5	4.0	1.9	0	
100	13.3	12.6	11.8	10.6	9.7	8.8	7.0	5.7	3.5	1.7	0
125	14.8	14.2	13.4	12.2	11.3	10.3	8.6	7.4	5.2	3.4	1.8
160	16.8	16.2	15.4	14.1	13.2	12.4	10.6	9.5	7.4	5.6	4.0
200	18.6	18.0	17.3	16.1	15.2	14.3	12.8	11.5	9.3	7.5	5.9
250	20.6	20.0	19.3	18.1	17.2	16.3	14.7	13.6	11.2	9.8	8.2
300	22.7	21.8	21.1	19.9	19.0	18.2	16.7	15.4	13.4	11.8	10.1
350	24.0	23.3	22.6	21.6	20.5	19.8	18.3	17.2	15.1	13.5	11.9
400	25.3	24.7	24.0	22.9	22.0	21.1	19.7	18.5	16.5	15.0	13.4

Note:
Table is for trap discharge at saturated steam temperature. Subcooled discharge traps release less flash. Load should be increased by 20% to allow for trap leakage, future growth, etc.

TI-P107-01
CTLS Issue 13

DP163, DP163G and DP163Y Pilot Operated Pressure Reducing Valves with Stainless Steel Bodies

Description

The DP163, DP163G and DP163Y pilot operated pressure reducing valves have been manufactured using stainless steel.

Available types

DP163	Suitable for steam applications
DP163G	Is a soft seal version available for compressed air and inert industrial gases. **Note:** It is not recommended for oxygen service.
DP163Y	Having a lower rate pressure control spring is suitable for steriliser/autoclave applications

Standards

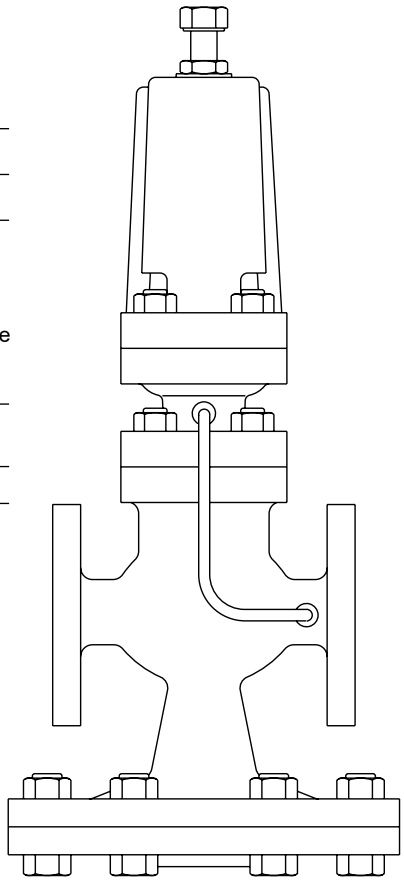
This product fully complies with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations and carries the CE mark when so required.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

DN15LC - Low Capacity version	DN15, DN20, DN25, DN32, DN40, DN50 and DN80. (½", ¾", 1", 1¼", 1½", 2", and 3")
Standard flanges:	EN 1092 PN25 and PN40, BS 10 Table 'J' and ASME (ANSI) 300.
Available on request:	ASME (ANSI) 150 and JIS 20.



Kv values

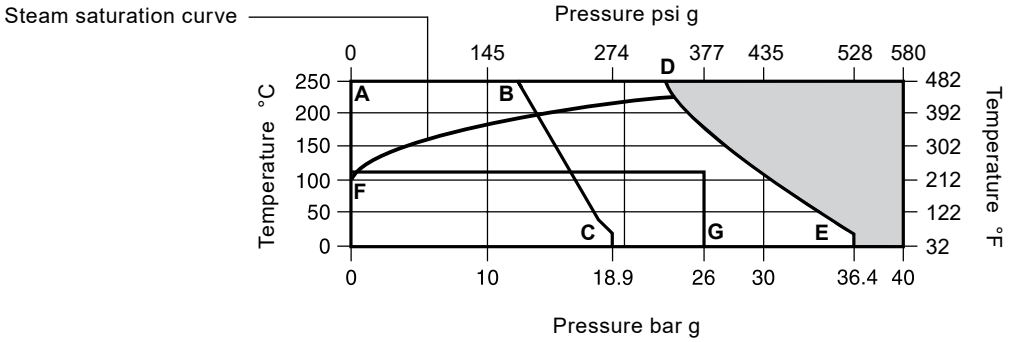
The Kv maximum values shown below are full capacities and should be used for safety valve sizing purposes only.

DN15LC	DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN80 (3")
1.0	2.8	5.5	8.1	12.0	17.0	28.0	64.0

For conversion:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

Note: Where the internal balance pipe is used the valve capacity will be reduced.

Pressure/temperature limits



The product **must not** be used in this region.

A-D-E Flanged EN 1092 PN40, BS 10 Table J and ASME (ANSI) 300.

A-B-C Flanged ASME (ANSI) 150.

F-G DP163G limited to 120 °C @ 26 bar g (248 °F @ 377 psi g).

Note: Two colour coded pressure adjustment springs are available for the following downstream pressure ranges:

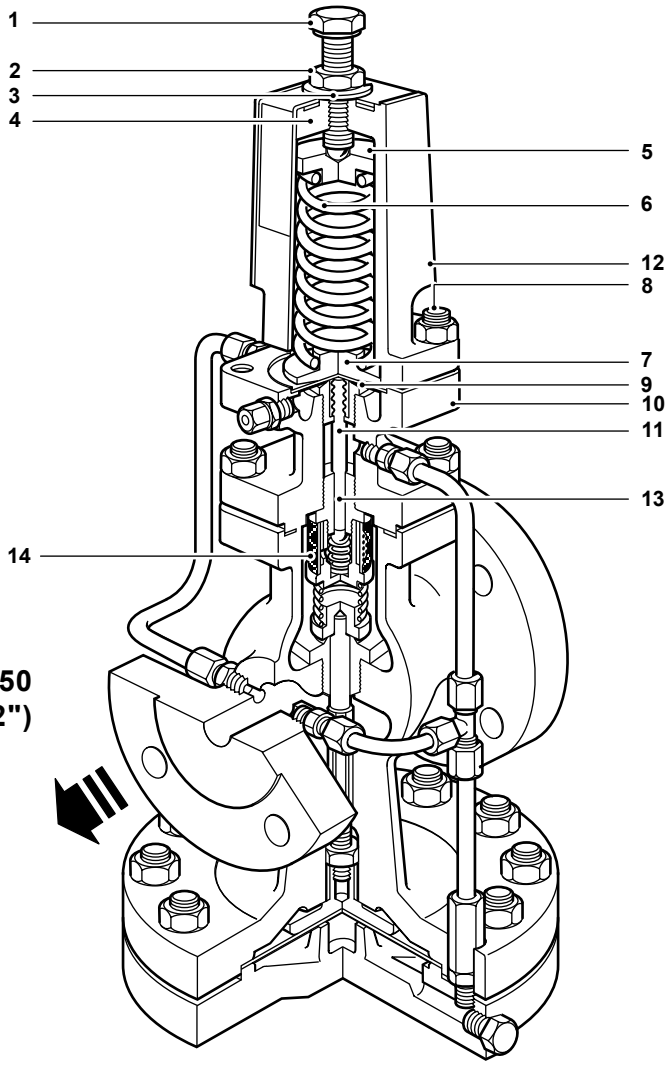
Red 0.2 bar g to 17 bar g (2.9 psi g to 247 psi g)

Grey 16.0 bar g to 21 bar g (232 psi g to 305 psi g)

Yellow 0.2 bar g to 3.0 bar g (2.9 psi g to 43.5 psi g) (DP163Y only)

Body design conditions			PN40
Maximum design pressure	**A-D-E**	36.4 bar g @ 20 °C	528 psi g @ 68 °F
	A-B-C	18.9 bar g @ 20 °C	274 psi g @ 68 °F
Maximum design temperature		250 °C @ 24 bar g	482 °F @ 348 psi g
Minimum design temperature		-10 °C	14 °F
Maximum upstream pressure for saturated steam service	**A-D-E**	25 bar g	363 psi g
	A-B-C	14 bar g	203 psi g
Maximum operating temperature	**A-D-E**	250 °C @ 24 bar g	482 °F @ 348 psi g
	A-B-C	250 °C @ 12.1 bar g	482 °F @ 175 psi g
Minimum operating temperature Note: For lower operating temperatures consult Spirax Sarco		0 °C	32 °F
Maximum differential pressure	**A-D-E**	25 bar g	363 psi g
	A-B-C	14 bar g	203 psi g
Designed for a maximum cold hydraulic test pressure of:		60 bar g	870 psi g
Note: With internals fitted, test pressure must not exceed:		40 bar g	580 psi g

Materials

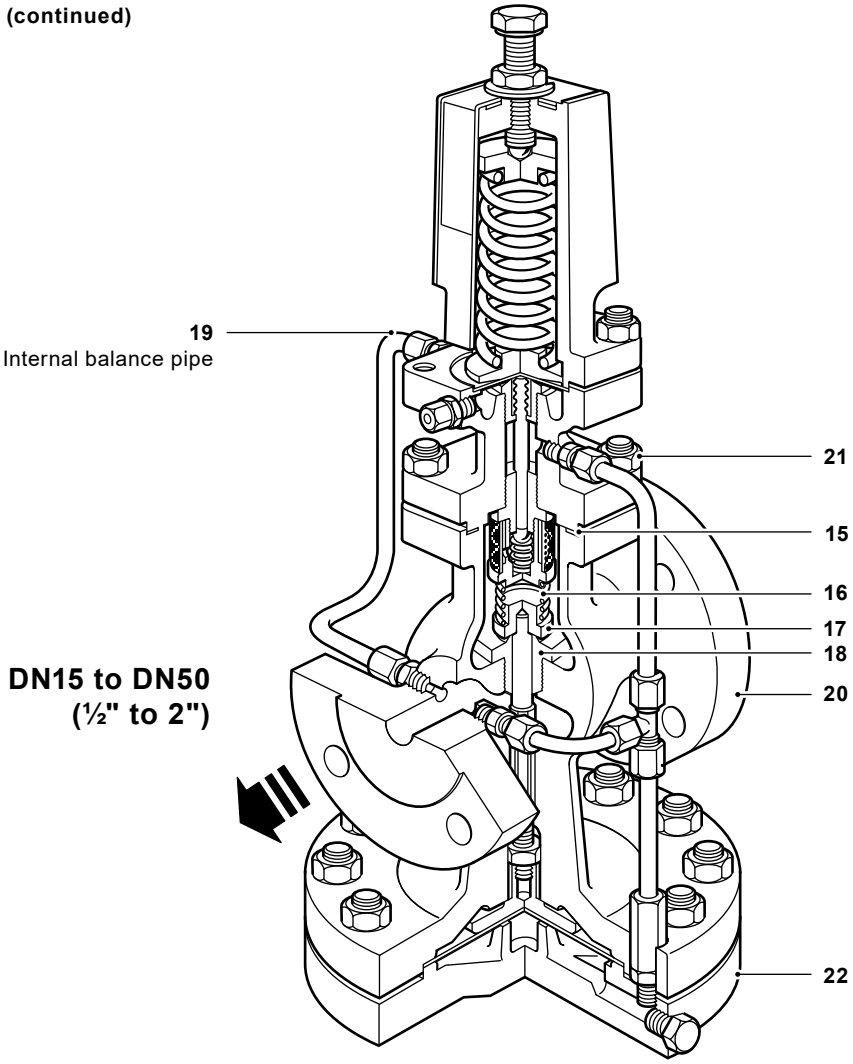


DN15 to DN50 (½" to 2")

No.	Part		Material	
1	Adjustment screw		Stainless steel	BS 6105 A4/80
2	Adjustment lock-nut		Stainless steel	BS 6105 A4/80
3	Washer		Stainless steel	BS 1449 304 S16
4	Spring housing		Stainless steel	DIN 3100 316 C12
5	Top spring plate		Stainless steel	BS 970 431 S29
6	Pressure adjustment spring		Stainless steel	BS 2056 302 S25
7	Bottom spring plate		Stainless steel	BS 970 431 S29
8	Spring housing	Securing nuts	Stainless steel	BS 6105 A4/80
		Securing studs	Stainless steel	BS 6105 A4/80
			DN15 to DN50 (½" to 2")	M10 x 30 mm
9	Pilot diaphragm		Stainless steel	BS 1449 316 S31
10	Pilot valve housing		Stainless steel	BS 3100 316 C12
11	Pilot valve plunger		Stainless steel	BS 970 431 S29
12	Spring housing cover		Stainless steel	BS 1449 304 S12
13	Pilot valve and seat unit		Stainless steel	BS 970 431 S29
14	Internal strainer		Stainless steel	BS 1449 304 S16

Materials continued on the next page

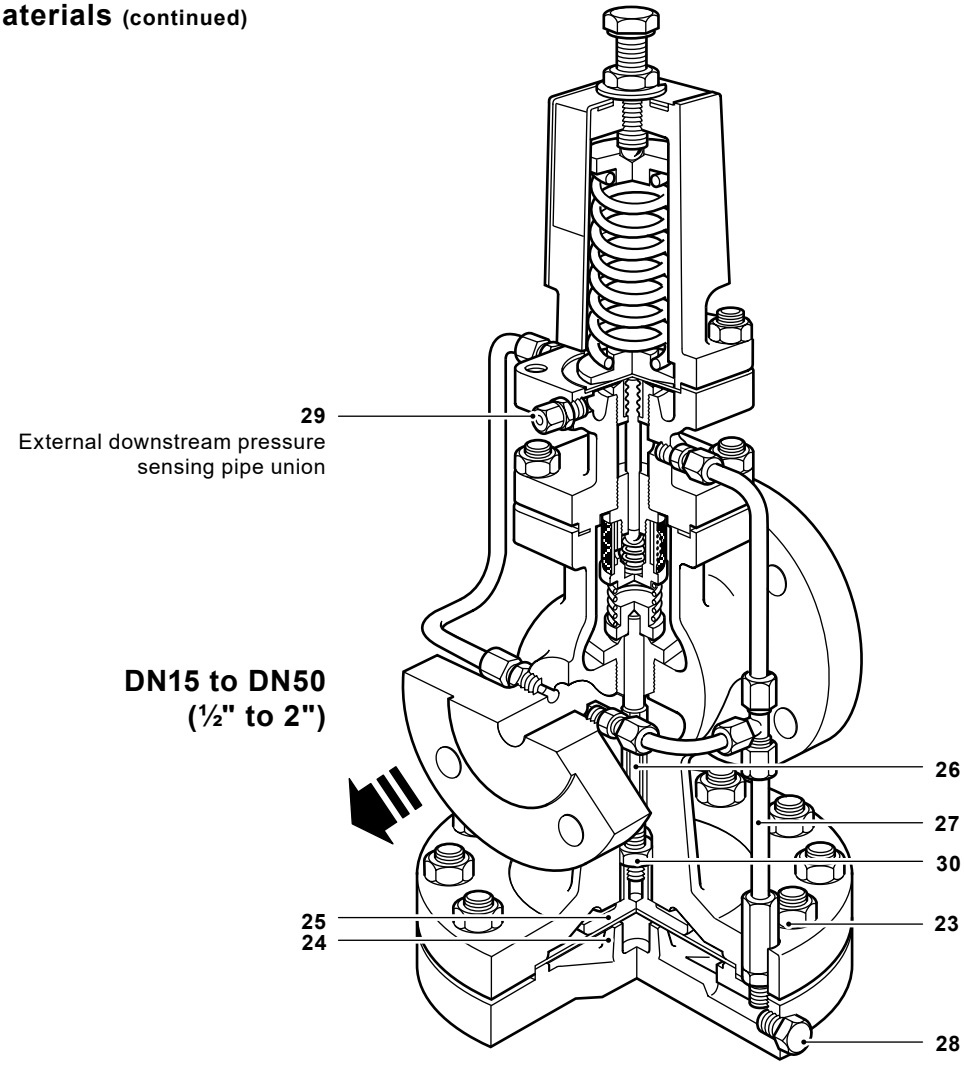
Materials (continued)



No.	Part		Material	
15	Body gasket	Stainless steel reinforced exfoliated graphite		
16	Main valve return spring		Stainless steel	BS 2056 302 S25
17	Main valve		Stainless steel	BS 970 431 S29
18	Main valve seat		Stainless steel	BS 970 431 S29
19	Balance pipe assembly		Stainless steel	BS 3605 304 S14
20	Main valve body		Stainless steel	BS 3100 316 C12
21	Pilot valve housing	Securing nuts	Stainless steel	BS 6105 A4/80
		Securing studs	Stainless steel	BS 6105 A4/80
			DN15 to DN20 (½" to 2")	M10 x 25 mm
			DN25 to DN50 (1" to 2")	M12 x 30 mm
			DN80 (3")	M12 x 40 mm
22	Main diaphragm chamber		Cast stainless steel	BS 3100 316 C12

Materials continued on the next page

Materials (continued)

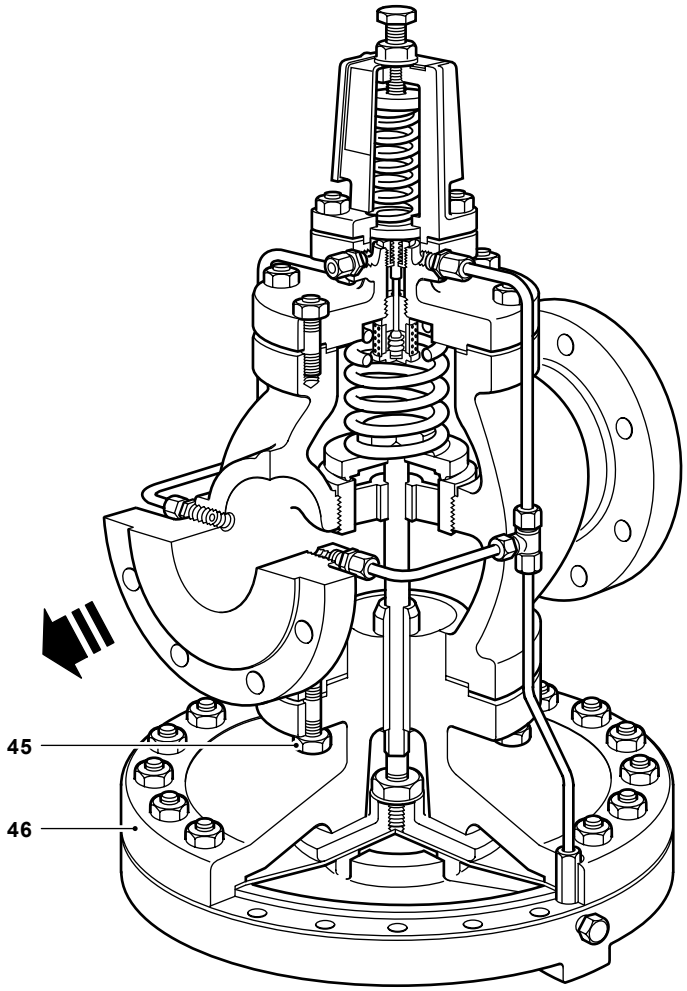


No.	Part		Material	
23	Main diaphragm	Securing nuts	Stainless steel	BS 3692 Gr. 8
		Securing bolts	Stainless steel	BS 6105 A4/80
			DN15 to DN20 (½" to 2")	M12 x 50 mm
			DN25 and DN32 (1" to 1¼")	M12 x 60 mm
			DN40 and DN50 (1½" to 2")	M12 x 65 mm
			DN80 (3")	M12 x 80 mm
24	Main diaphragms		Stainless steel	BS 1449 316 S31
25	Main diaphragm plate		Stainless steel	BS EN 10088-3 1.4307
26	Pushrod		Stainless steel	BS 970 431 S29
27	Control pipe assembly		Stainless steel	BS 3605 304 S14
28	Plug ⅛" BSP		Stainless steel	BS 970 431 S29
29	Pressure pipe union		Stainless steel	BS 970 316 S31
30	Lock-nut		Stainless steel	BS 6105 A4/80

Materials continued on the next page

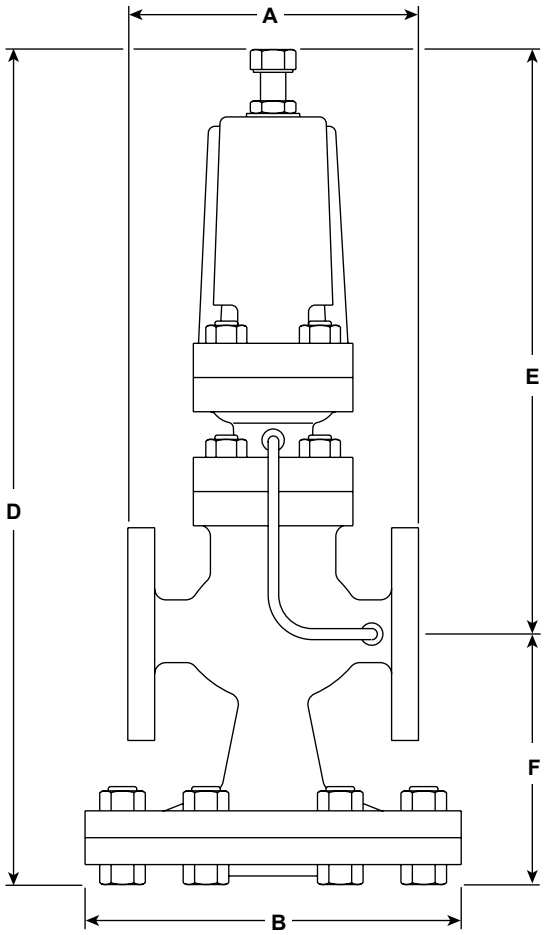
Materials (continued)

DN80



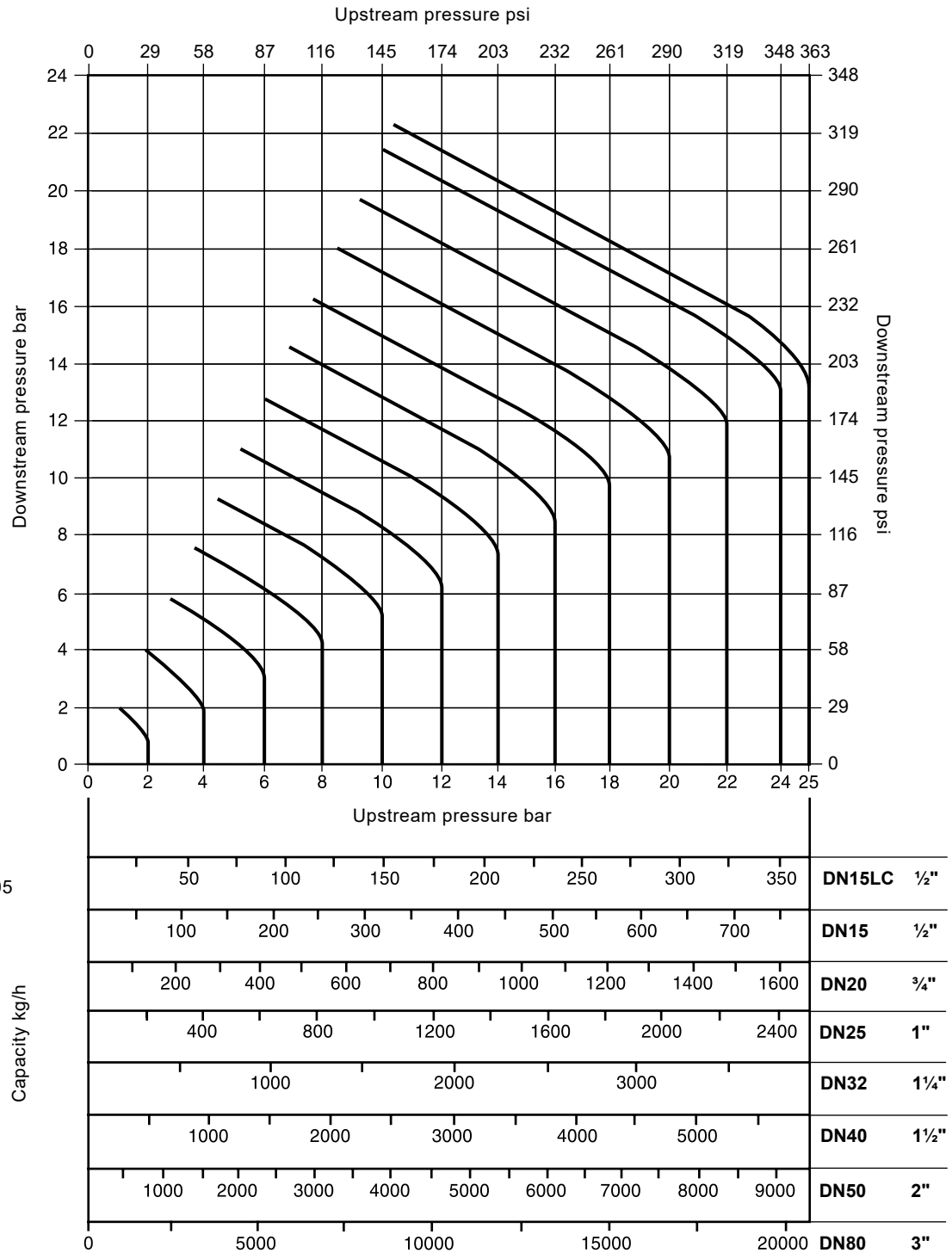
No.	Part	Material	
	Body nuts	Stainless steel	BS 3692 Gr. 8
45	Body studs	Stainless steel	BS 6105 A4/80
		DN80 (3") only	M12 x 40 mm
46	Upper main diaphragm chamber	Stainless steel	BS 3100 316 C12

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Sizes	EN 1092 PN40 A	ASME 300 A	ASME 150 A	BS 10 Table J A	B	D	E	F	Weight
DN15 LC	130 (5.12)	130 (5.12)	122 (4.80)	130 (5.12)	175 (6.89)	405 (15.9)	277 (10.9)	128 (5.04)	15 (33.1)
DN15									
DN20	150 (5.91)	150 (5.91)	142 (5.59)	150 (5.91)					16 (35.3)
DN25	160 (6.30)	160 (6.30)	156 (6.14)	164 (6.46)	216 (8.50)	440 (17.3)	288 (11.3)	152 (5.98)	23 (50.7)
DN32	180 (7.09)	183 (7.20)	176 (6.93)	184 (7.24)					25 (55.1)
DN40	200 (7.87)	209 (8.23)	200 (7.87)	209 (8.23)	280 (11.0)	490 (19.3)	305 (12.0)	185 (7.28)	40 (88.2)
DN50	230 (9.06)	236 (9.29)	230 (9.06)	243 (9.57)					42 (92.6)
DN80	310 (12.2)	319 (12.6)	310 (12.2)	325 (12.8)	350 (13.8)	580 (22.8)	322 (12.7)	258 (10.2)	103 (227)

Steam capacities chart



Steam capacities chart

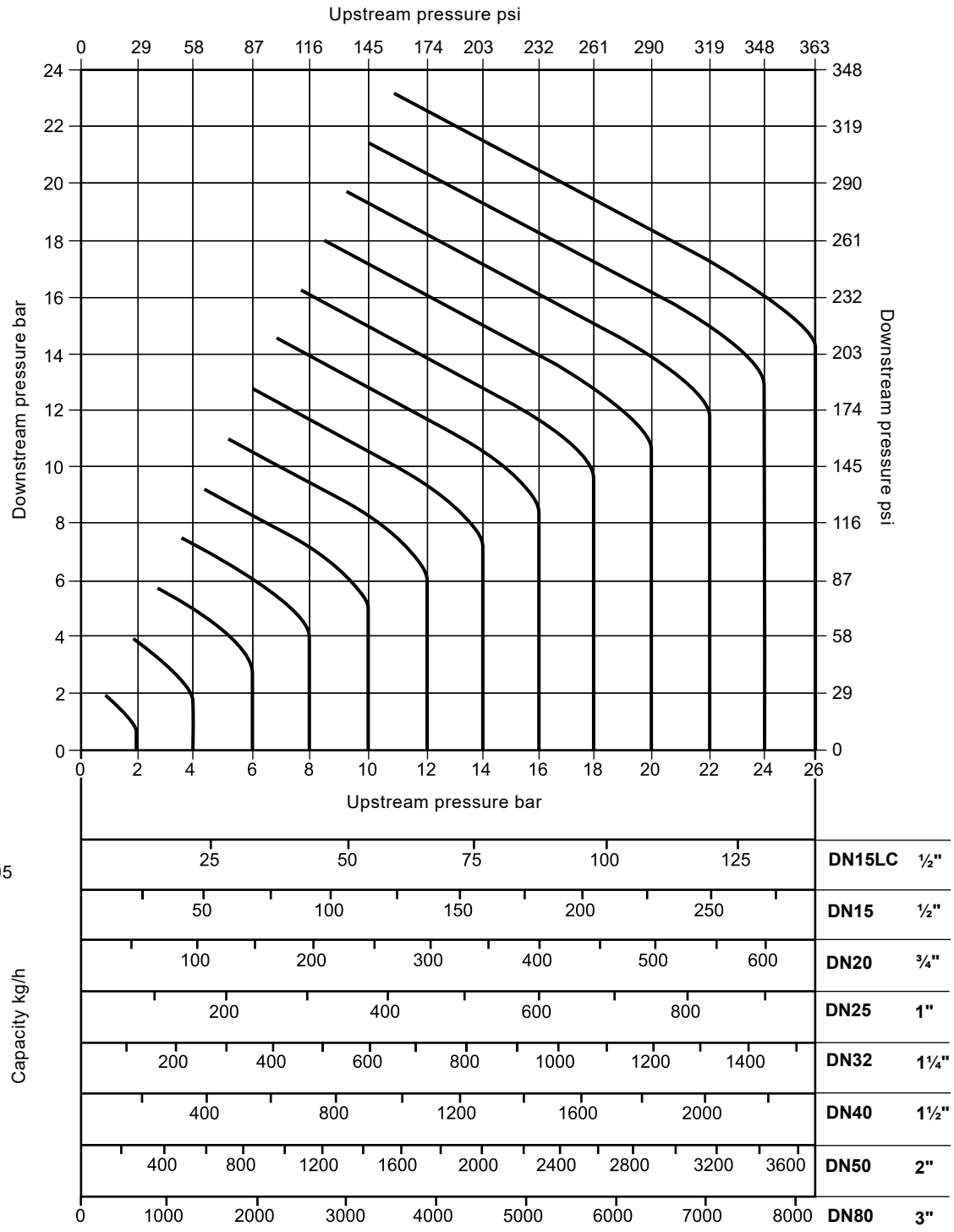
Note
The capacities quoted above are based on valves fitted with an external pressure sensing pipe. Reliance on the internal balance pipe will mean that capacities may be reduced. In the case of low downstream pressure this reduction could be up to 30% of the valve capacity.

How to use the chart

Saturated steam
A valve is required to pass 600 kg/h (1323 lb/h) reducing from 6 bar to 4 bar (87.0 psi to 58.0 psi). Find the point at which the curved 6 bar (87.0 psi) upstream pressure line crosses the horizontal 4 bar (58.0 psi) downstream pressure line. A perpendicular dropped from this point gives the capacities of all DP sizes under these conditions. A DN32 (1¼") valve, is the smallest size which will carry the required load.

Superheated steam
Because of the higher specific volume of superheated steam a correction factor must be applied to the figure obtained from the chart above. For 55 °C (131 °F) of superheat the factor is 0.95 and for 100 °C (212 °F) of superheat the factor is 0.9.
Using the example given for saturated steam, the DN32 (1¼") valve would pass 740 x 0.95 = 703 kg/h (1550 lb/h) if the steam had 55 °C (131 °F) of superheat.
It is still big enough to pass the required load of 600 kg/h (1323 lb/h).

Compressed air capacities chart



For lb/h, multiply by 2.205

Compressed air capacities chart

How to use the chart

Capacities are given in cubic decimetres of free air per second (dm^3/s). The use of the capacity chart can be best explained by an example. Required, a valve to pass 100 dm^3/s of free air reducing from 12 bar to 8 bar (174 psi to 116 psi).
Find the point at which the curved 12 bar (174 psi) upstream pressure line crosses the horizontal 8 bar (116 psi) downstream pressure line. A perpendicular dropped from this point shows that whereas a DN15LC valve will only pass 57 dm^3/s and is therefore not large enough, a DN15 (½") valve will pass approximately 120 dm^3/s under these conditions and is the correct valve size to choose.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P006-07) supplied with the product.

Installation note: The valve should be installed in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve body.

How to order

Example: 1 off Spirax Sarco DN32 DP163 pilot operated pressure reducing valve fitted with a red pressure adjustment spring and having flanged EN 1092 PN25 connections.

Spare parts

Available spares

Maintenance kit
A stand-by set of spares for general maintenance purposes and covers all spares marked*

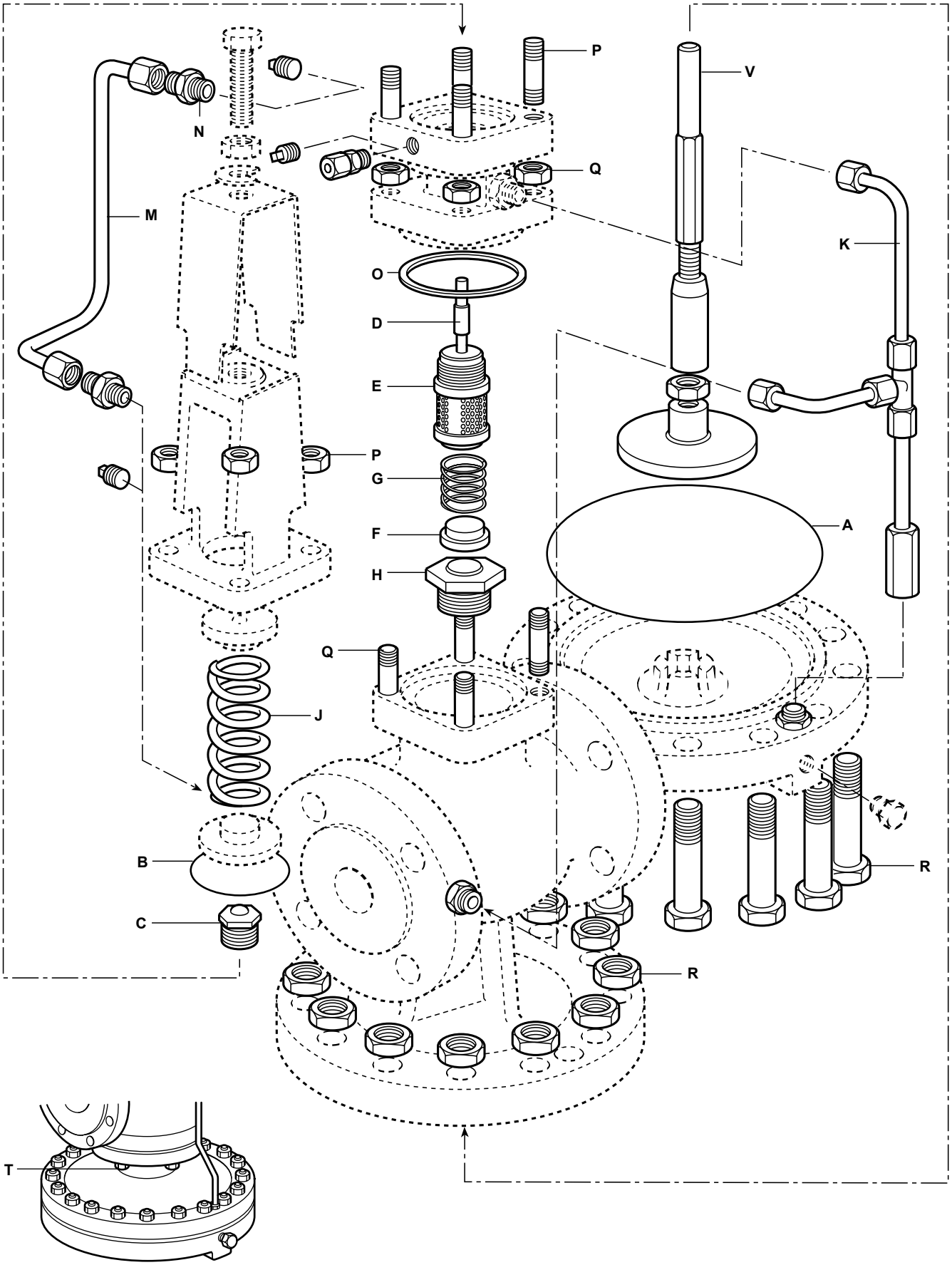
* Main diaphragm	(2 off)				A
* Pilot diaphragm	(2 off)				B
Pilot valve seal assembly					C
* Pilot valve and plunger assembly					D, E
Main valve assembly					F, H
* Main valve return spring					G
Pressure adjustment spring	Red	DP163 and DP163G	0.2 to 17 bar	(2.9 to 247 psi)	J
	Grey	DP163 and DP163G	16 to 21 bar	(232 to 305 psi)	
	Yellow	DP163Y and DP163G	0.2 to 3 bar	(2.9 to 43.5 psi)	
* Control pipe assembly					K
* Balance pipe assembly					M, N
* Body gasket		(packet of 3)			O
Set of spring housing securing studs and nuts	(set of 4)				P
Set of pilot valve housing securing studs and nuts	(set of 4)				Q
Set of diaphragm chamber securing bolts and nuts	(set of 10)	DN15 and DN20 (½" and ¾")			R
	(set of 12)	DN25 and DN32 (1" and 1¼")			
	(set of 16)	DN40 and DN50 (1½" and 2")			
	(set of 20)	DN80 (3")			
Set of main body studs and nuts (DN80 (3"))	(set of 6)				T
Pushrod and main diaphragm plate assembly					V

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of pressure reducing valve.

Example: 1 - Main valve assembly for a Spirax Sarco DN15 DP163 pressure reducing valve.

How to fit - See the Installation and Maintenance Instructions supplied with the pressure reducing valve. Further copies are available on request.



Arrangement of main diaphragm chamber DN80 (3") size only.

Interchangeability of spares

The following table shows how in certain sizes some parts are interchangeable. For example in the line headed 'Main diaphragm' the diaphragm used in the following sizes: DN15LC, DN15 and DN20 (½" and ¾") is common to these sizes by the letter 'a'. The letter 'b' indicates that sizes DN25 and DN32 (1" and 1¼")use one common diaphragm.
Some parts, particularly pilot and main valve assemblies are specific to particular models e.g 'DP163G'. Interchangeability is therefore restricted to model type for some parts.
Please note for storage purposes: The spare parts marked † are not of the same material as those for the DP143, consequently they are not compatible for interchangeability.

Size	DN15LC (½")	** DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN80 (3")
Main diaphragm	a	a	a	b	b	c	c	d
Pilot diaphragm	a	a	a	a	a	a	a	a
Pilot valve seal assembly	a	a	a	a	a	a	a	a
Pilot valve and plunger assembly	a	a	a	a	a	a	a	a
Main valve assembly	a	b	c	d	e	f	g	h
Main valve return spring	a	a	a	b	b	c	c	d
Pressure adjustment spring	a	a	a	a	a	a	a	a
Control pipe assembly †	a	a	b	c	d	e	f	g
Balance pipe assembly †	a	a	b	c	d	e	f	g
Body gasket †	a	a	a	b	b	c	c	d
Set of spring housing securing studs and nuts †	a	a	a	a	a	a	a	a
Set of pilot valve housing securing studs and nuts †	a	a	a	b	b	c	c	d
Set of diaphragm chamber securing bolts and nuts †	a	a	a	b	b	c	c	d
Set of main body studs and nuts †	–	–	–	–	–	–	–	a

**** Not available for the DP163G**

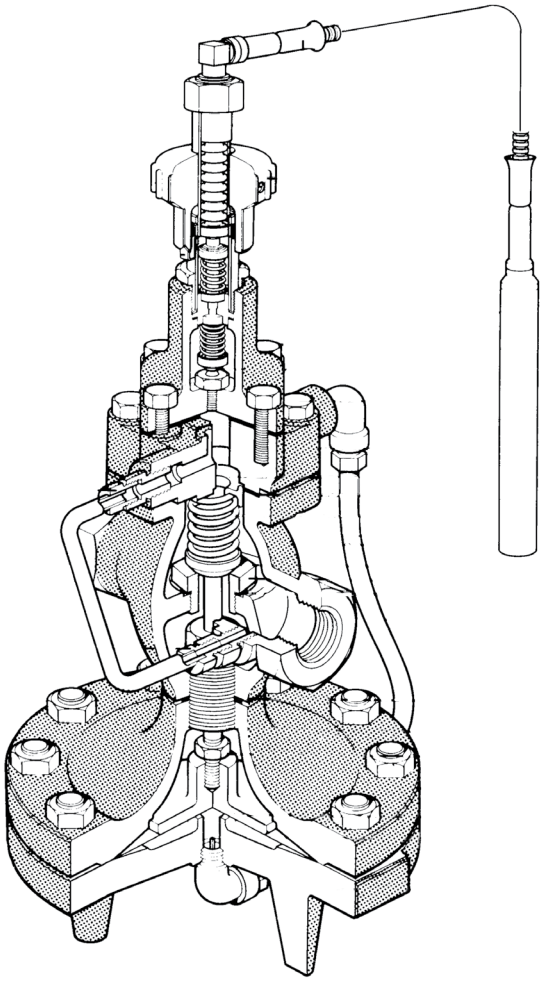
TI-P235-11-US
Issue 1

Pilot Operated Temperature Regulators
½" to 4" 25T

Description

The 25T is a self actuated pilot-operated temperature regulating valve. The temperature pilot has a calibrated dial for accurate temperature setting, and is available with a variety of solid-fill sensing bulbs (see TI-P235-07-US). The standard capillary tubing length is 8 feet, with an optional standard length of 15 feet.

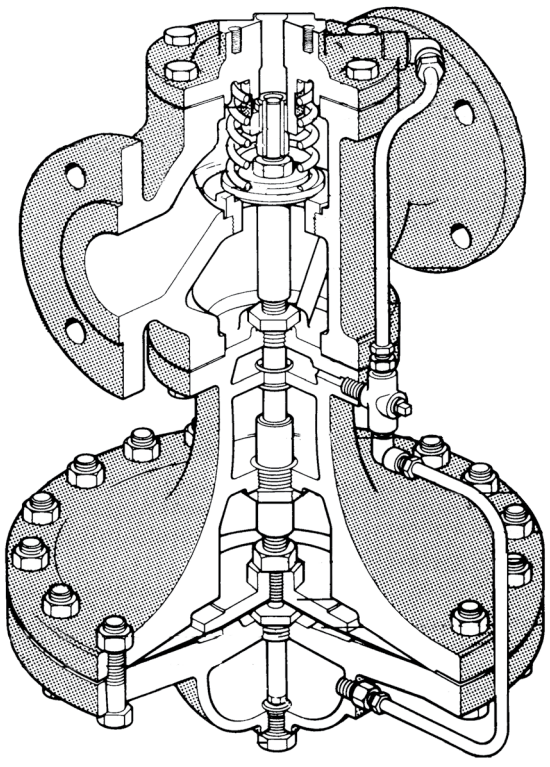
Model	25T			
Sizes	½" to 2"	2½", 3", 4"	½" to 2"	2", 2½", 3", 4"
Connections	NPT	ANSI 125	NPT	ANSI 300
Construction	Cast iron		Cast steel	
Options	ANSI 250		ANSI 150 (excludes 2")	
	Non-Standard capillary tubing length (see TI-P235-07-US) in 5 ft. intervals to a maximum of 50 ft.			



½" to 2"

Typical applications

Storage steam water heaters, instantaneous heat exchangers and converters, air handling coils, tank heating coils, steam jacketed vessels, steam chests, molds and platens.



2"* to 4" *ANSI 300 ONLY

Limiting operating conditions

PMO	Maximum operating pressure	NPT:	250 psi g (17 bar g) @ 450 °F (232 °C)
		ANSI 125:	125 psi g (8 bar g) @ 450 °F (232 °C)
		ANSI 250:	250 psi g (17 bar g) @ 450 °F (232 °C)
		ANSI 150:	185 psi g (12 bar g) @ 450 °F (232 °C)
		ANSI 300:	300 psi g (20 bar g) @ 450 °F (232 °C)
Maximum operating temperature (The temperature of the sensing bulb must not exceed 350 °F (177 °C))			450 °F (232 °C)

Standard temperature ranges

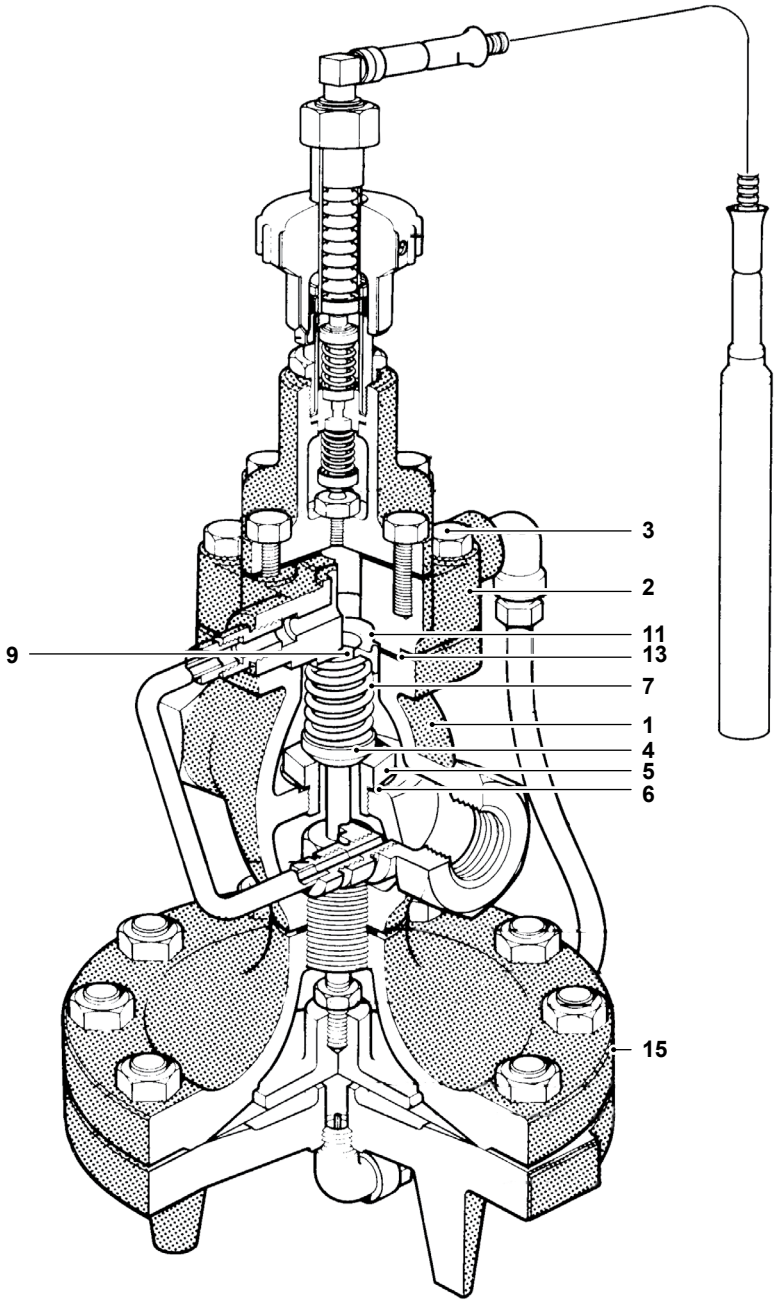
30 °F to 90 °F	(0 °C to 32 °C)
60 °F to 120 °F	(15 °C to 50 °C)
100 °F to 160 °F	(40 °C to 70 °C)
120 °F to 180 °F	(50 °C to 80 °C)
160 °F to 220 °F	(70 °C to 105 °C)
200 °F to 260 °F	(95 °C to 125 °C)
260 °F to 320 °F	(125 °C to 160 °C)

Pressure shell design conditions

PMA	Max. allowable pressure	Cast iron	250 psi g @ 450 °F	(17 bar g @ 232 °C)
		Cast steel	300 psi g @ 450 °F	(20 bar g @ 232 °C)
TMA	Maximum allowable temperature	Cast iron	450 °F @ 250 psi g	(232 °C @ 17 bar g)
		Cast steel	450 °F @ 300 psi g	(232 °C @ 20 bar g)

Materials

½" to 2"

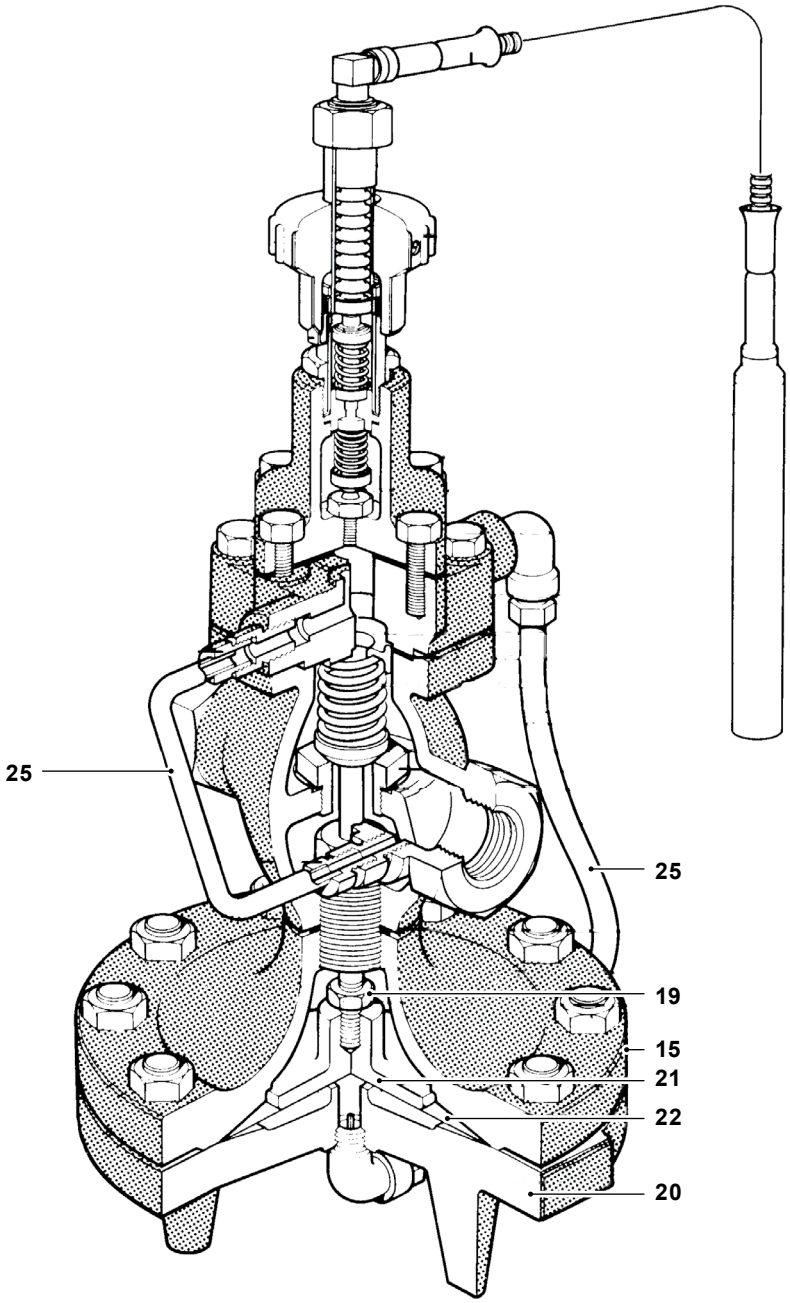


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless steel	

No.	Part	Material	
8	Valve Stem	Stainless steel	
9	Strainer Screen	Stainless steel	
10	Valve Stem Sleeve	Stainless steel	
11	Spring Guide	Cast iron ½"-2" CRS 2"* - 4"	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless steel	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB

Materials

½" to 2"

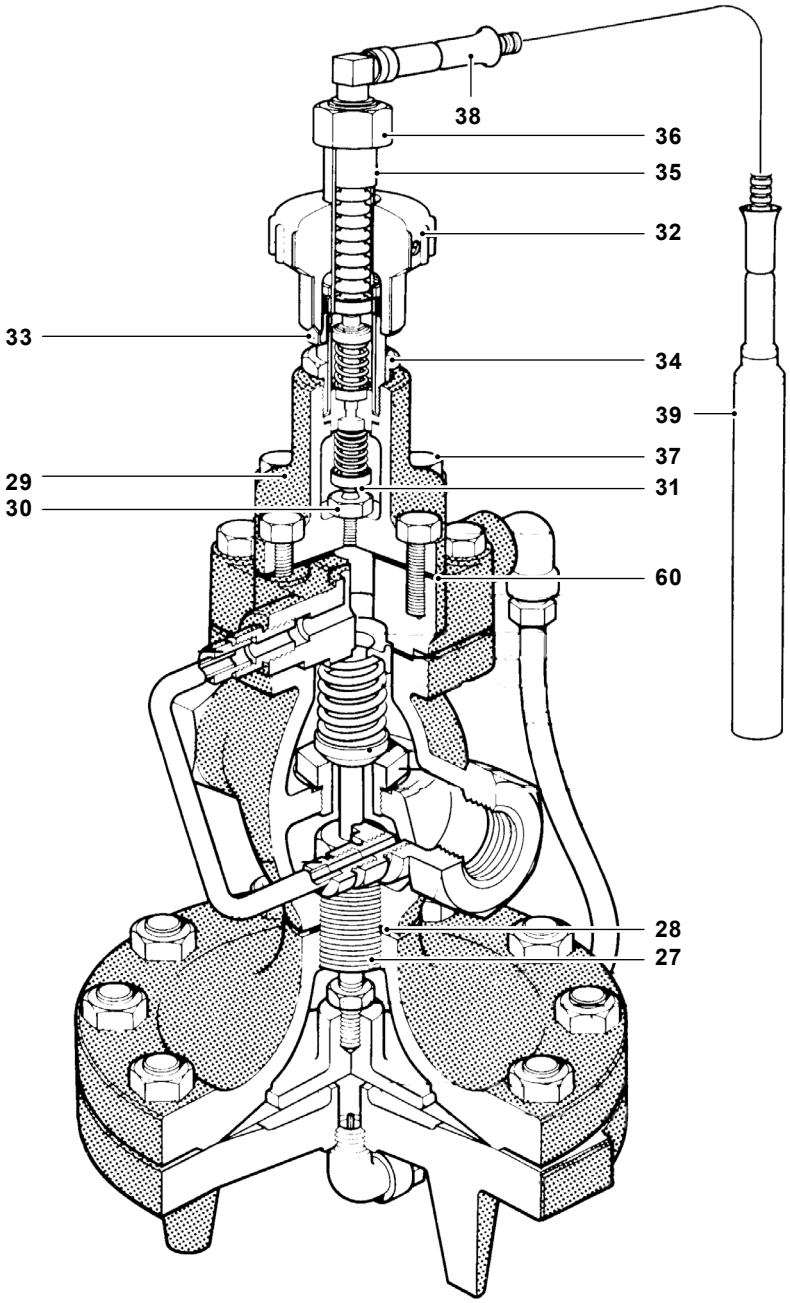


No.	Part	Material
16	Stem Bushing	Stainless steel (2½" - 4" Cast steel only)
17	Diaphragm Plate Stem	Stainless steel
18	Diaphragm Stem Guide	Stainless steel
19	Nut	Brass ½" - 2"
		Steel 2"* - 4"
20	Lower Diaphragm Case	Cast iron
		Cast steel

No.	Part	Material
21	Diaphragm Plate	Brass ½" - 2"
		C.I. 2"* - 4"
22	Main Diaphragm (2 ply)	Stainless steel
23	Bushing	CRS
24	Tube & Orifice	Stainless steel
25	Tubing Assembly	Copper
		Brass

Materials

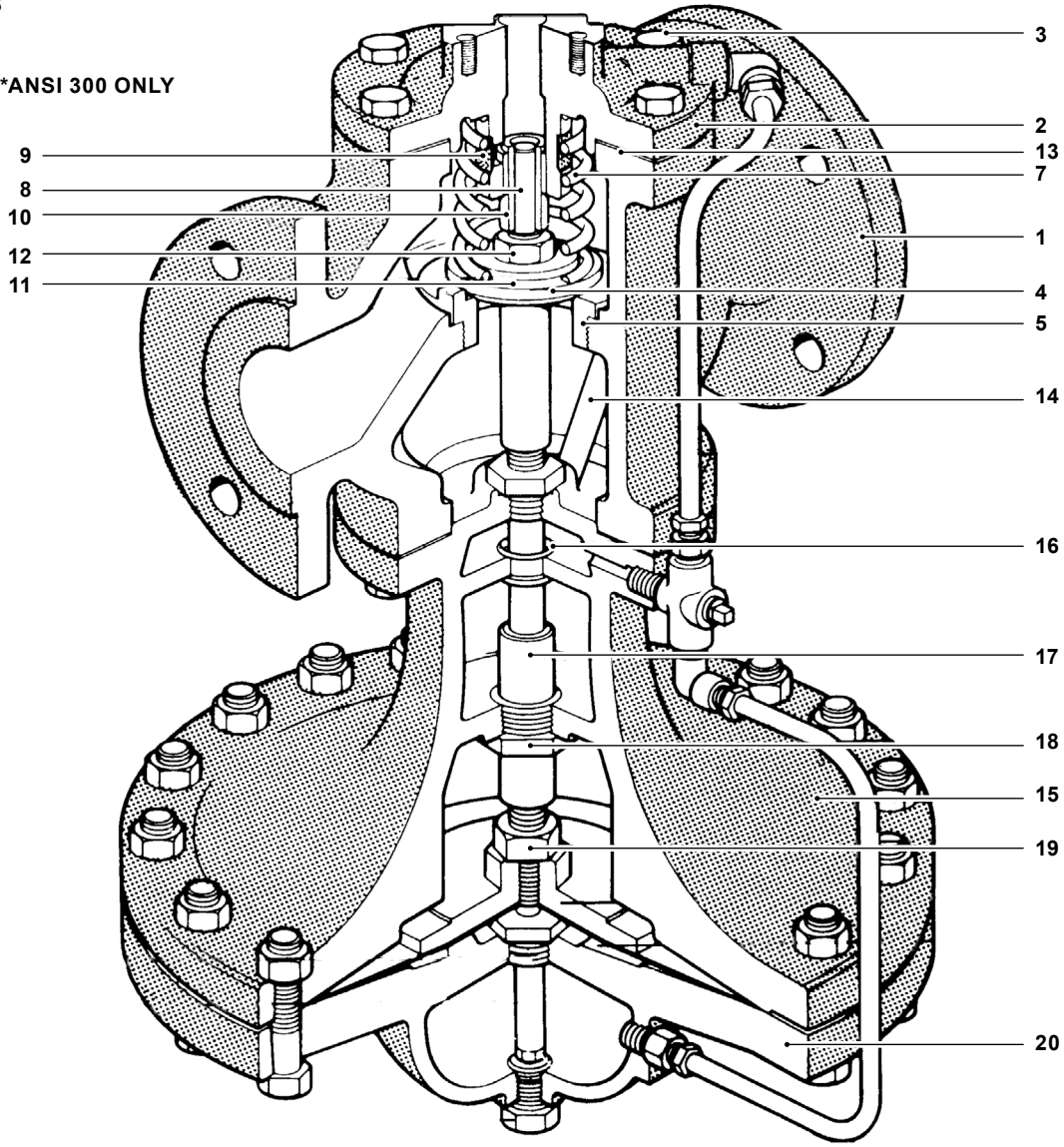
½" to 2"



No.	Part	Material	
26	Plug (Used on flanged valves 2" to 4")	Brass	
		Steel	
27	Connector Stud	Stainless steel	
28	Body Gasket	½" - 2" Copper Clad	
		2"* - 4" Graphite	
29	Pilot Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
30	Pilot Valve Seat	Stainless steel	
31	Pilot Valve Head	Stainless steel	

Materials

2"* to 4" *ANSI 300 ONLY

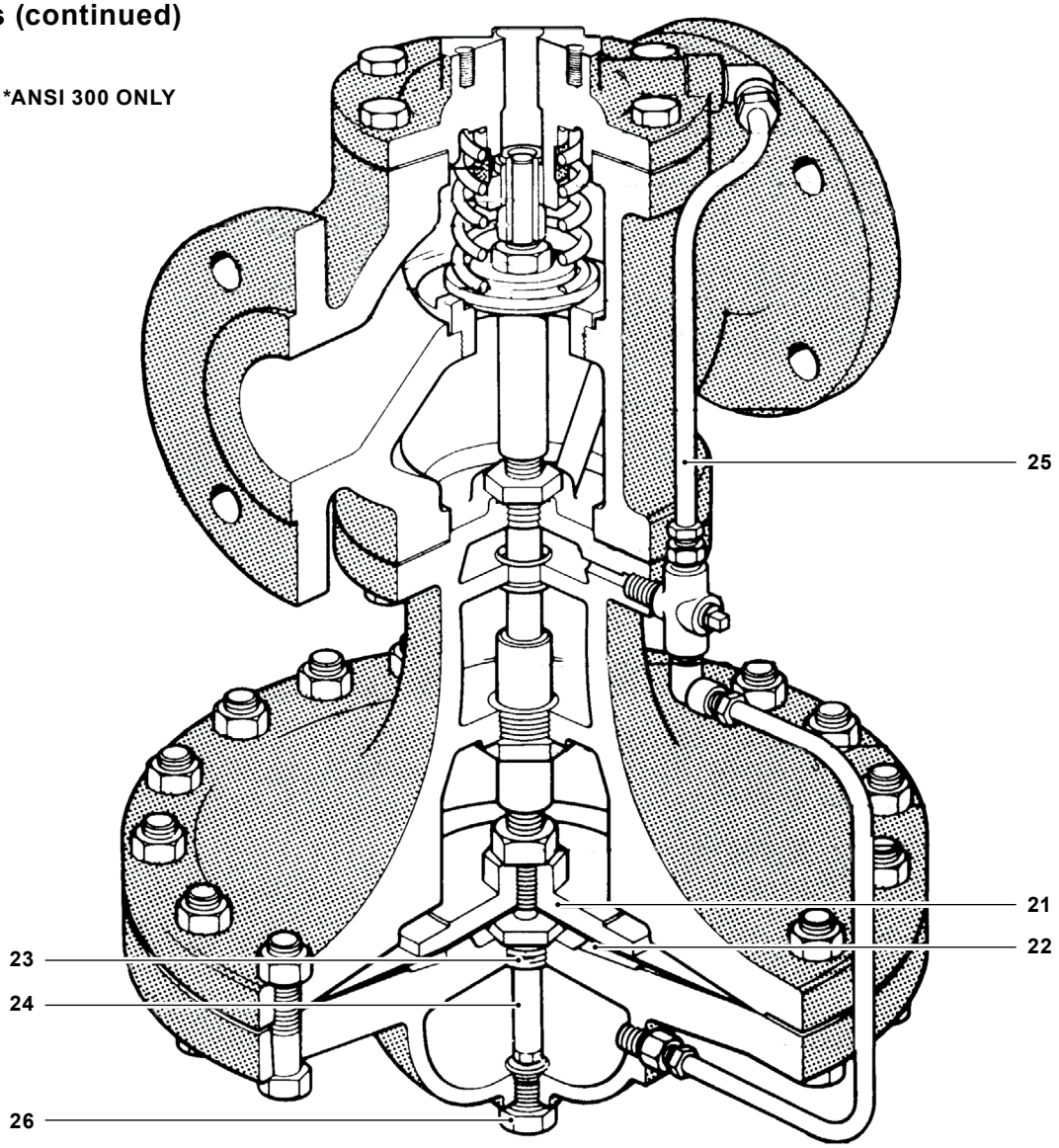


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless steel	
8	Valve Stem	Stainless steel	
9	Strainer Screen	Stainless steel	
10	Valve Stem Sleeve	Stainless steel	
11	Spring Guide	Cast iron ½"-2" CRS 2"* - 4"	

No.	Part	Material	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless steel	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
16	Stem Bushing	Stainless steel (2½" - 4" Cast steel only)	
17	Diaphragm Plate Stem	Stainless steel	
18	Diaphragm Stem Guide	Stainless steel	
19	Nut	Brass ½" - 2"	
		Steel 2"* - 4"	
20	Lower Diaphragm Case	Cast iron	
		Cast steel	

Materials (continued)

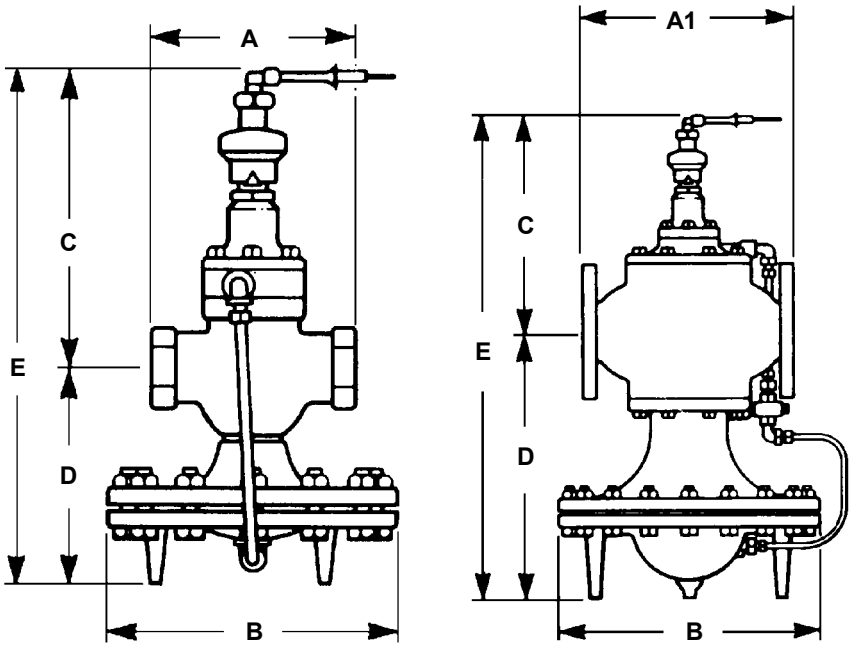
2"* to 4" *ANSI 300 ONLY



No.	Part		Material
21	Diaphragm Plate		Brass ½" - 2"
			C.I. 2"* - 4"
22	Main Diaphragm (2 ply)		Stainless steel
23	Bushing		CRS
24	Tube & Orifice		Stainless steel
25	Tubing Assembly		Copper
			Brass
26	Plug	(Cast iron)	Brass
		(Cast steel)	Steel
27	Connector Stud		Stainless steel
28	Body Gasket		½" - 2" Copper Clad
			2"* - 4" Graphite

No.	Part	Material	
29	Pilot Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
30	Pilot Valve Seat	Stainless steel	
31	Pilot Valve Head	Stainless steel	
32	Adjustment Knob	Phenolic	
33	Pointer	Stainless steel	
34	Extension Nut	Brass	
35	Case Tube	Brass	
36	Retaining Nut	Brass	
37	Pilot Mounting Screws	Steel	
38	Capillary Tube	Varies with style selected	
39	Bulb	Varies with style selected	
60	Pilot Gasket	Stainless steel	

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



½" to 2" 2"* to 4"

		ANSI 125	ANSI 250 ANSI 300					Weight	
Size	A	A1	A1	B	C	D	E	Cast iron	Cast steel
½", ¾"	5.5	–	–	7.6	9.8	6.2	16.0	27 lb	30 lb
	140	–	–	(193)	(249)	(157)	(406)	(12.2 kg)	(13.6 kg)
1"	6.0	–	–	8.6	9.75	6.75	16.5	34 lb	37 lb
	152	–	–	(219)	(248)	(171)	(419)	(15.4 kg)	(16.8 kg)
1¼", 1½"	7.25	–	–	8.6	10.3	7.1	17.4	39.5 lb	43 lb
	184	–	–	(219)	(262)	(180)	(442)	(17.9 kg)	(19.5 kg)
2"	8.5	–	9.0	10.6	10.9	8.2	19.1	64 lb	70 lb
	216	–	(229)	(270)	(277)	(208)	(485)	(29 kg)	(31.8 kg)
2½"	–	10.9	11.5	13.6	11.7	13.9	25.6	152.5 lb	166 lb
	–	(277)	(292)	(346)	(297)	(353)	(650)	(69.2 kg)	(75.3 kg)
3"	–	11.75	12.5	13.6	11.6	14.4	26.0	183.5 lb	200 lb
	–	(298)	(318)	(346)	(295)	(365)	(660)	(83.2 kg)	(90.7 kg)
4"	–	13.9	14.5	15.6	12.8	16.1	28.9	279.5 lb	305 lb
	–	(353)	(368)	(397)	(325)	(409)	(734)	(127 kg)	(138 kg)

Capacities
For selection and sizing data, see TI-P235-18-US.

Sample Specification
Temperature Regulators shall be of the pilot-actuated, diaphragm-operated type. The main valve shall be single-seated, with hardened stainless steel trim; the valve body shall be cast iron (cast steel). The pilot shall be bolted directly to the valve body and shall be removable without disturbing the control connections. The temperature setting shall be adjustable without the use of tools, and the set point shall be indicated on a calibrated dial. The thermostatic system shall be solid fill, and shall incorporate overheat protection.

Installation
The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the valve. The trap and regulator should both be protected with a strainer. The thermostatic bulb must be carefully located in the medium being heated. Complete installation instructions are given in IM-1-1116-US.

Maintenance
Complete installation and maintenance instructions are given in IM-1-1116-US, a copy of which is supplied with each valve. Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

TI-P235-12-US
Issue 1

Pilot Operated Temperature Regulator 6" 25T

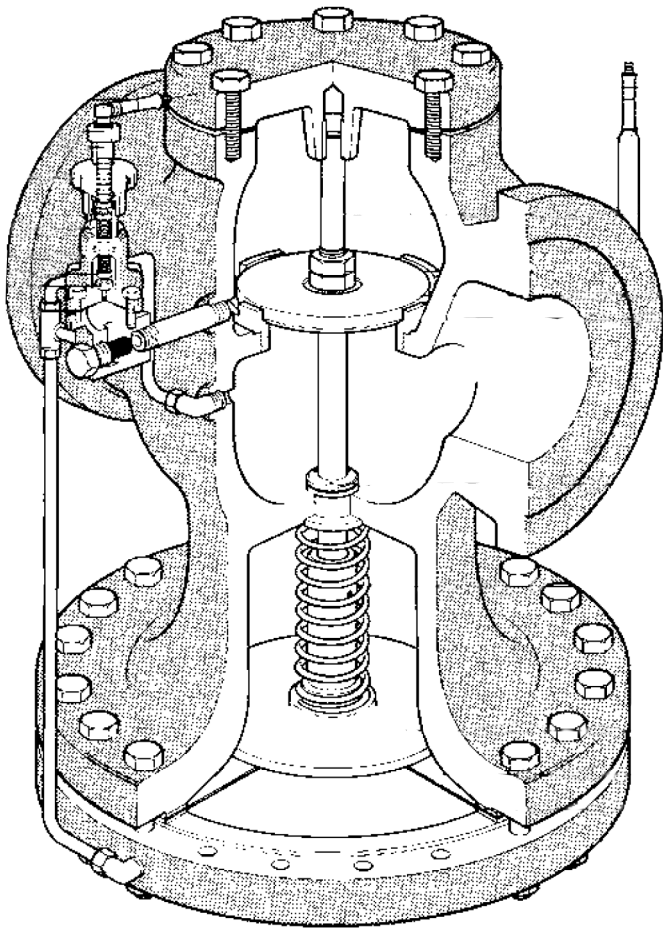
Description

The 25T is a self actuated pilot-operated temperature regulating valve. The temperature pilot has a calibrated dial for accurate temperature setting, and is available with a variety of solid-fill sensing bulbs (see TI-P235-07-US). Standard capillary tubing lengths are 8 feet (2.4 meters) and 15 feet (4.6 meters). This valve meets Class IV shut-off specifications but is not suitable for dead-end service.

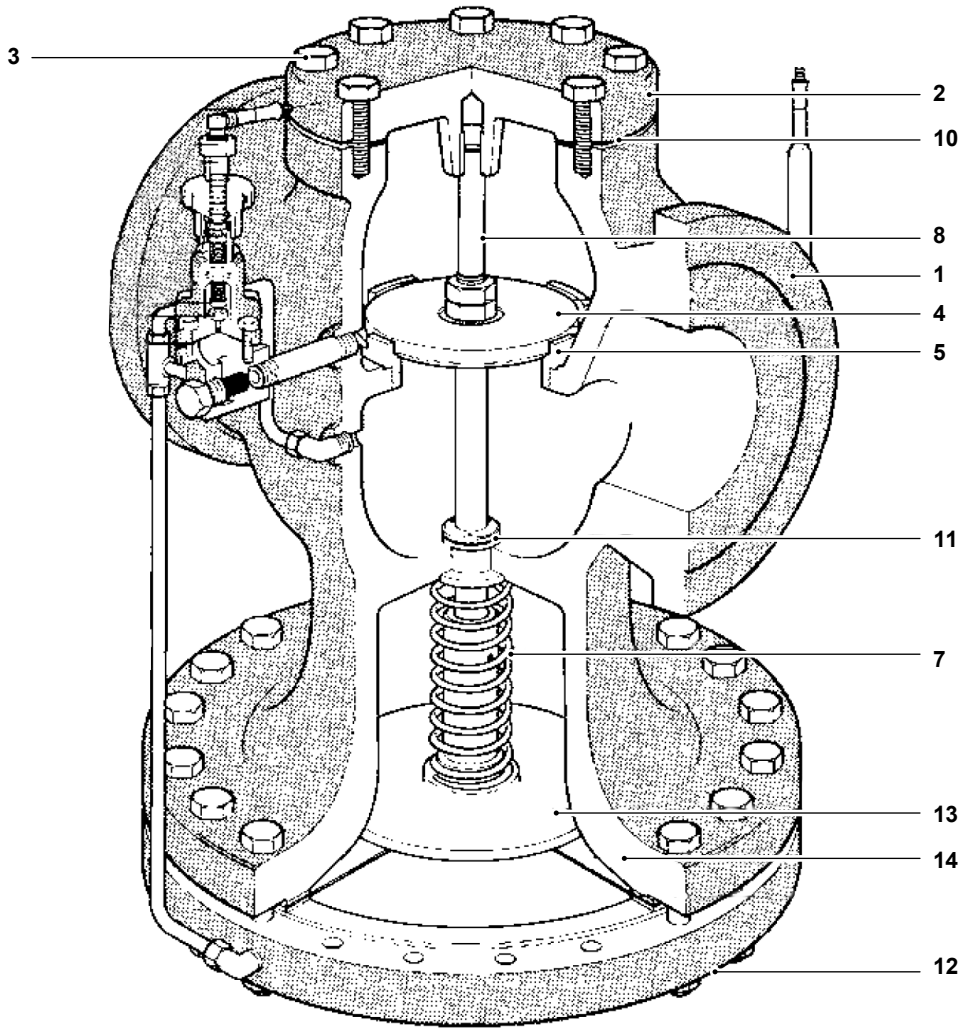
Model	**25T**	
Sizes	6" (DN150)	
Connections	ANSI 125, 250	ANSI 150, 300
Construction	Cast Iron	Cast Steel
Options	Reduced Orifice Designated by "S" Non-Standard capillary tubing length in 5 ft. (1.5 m) intervals to a maximum of 50 ft. (15 m) (See TI-P235-07-US)	

Typical applications

Storage steam water heaters, instantaneous heat exchangers and converters, air handling coils, tank heating coils, steam jacketed vessels, steam chests, molds and platens.

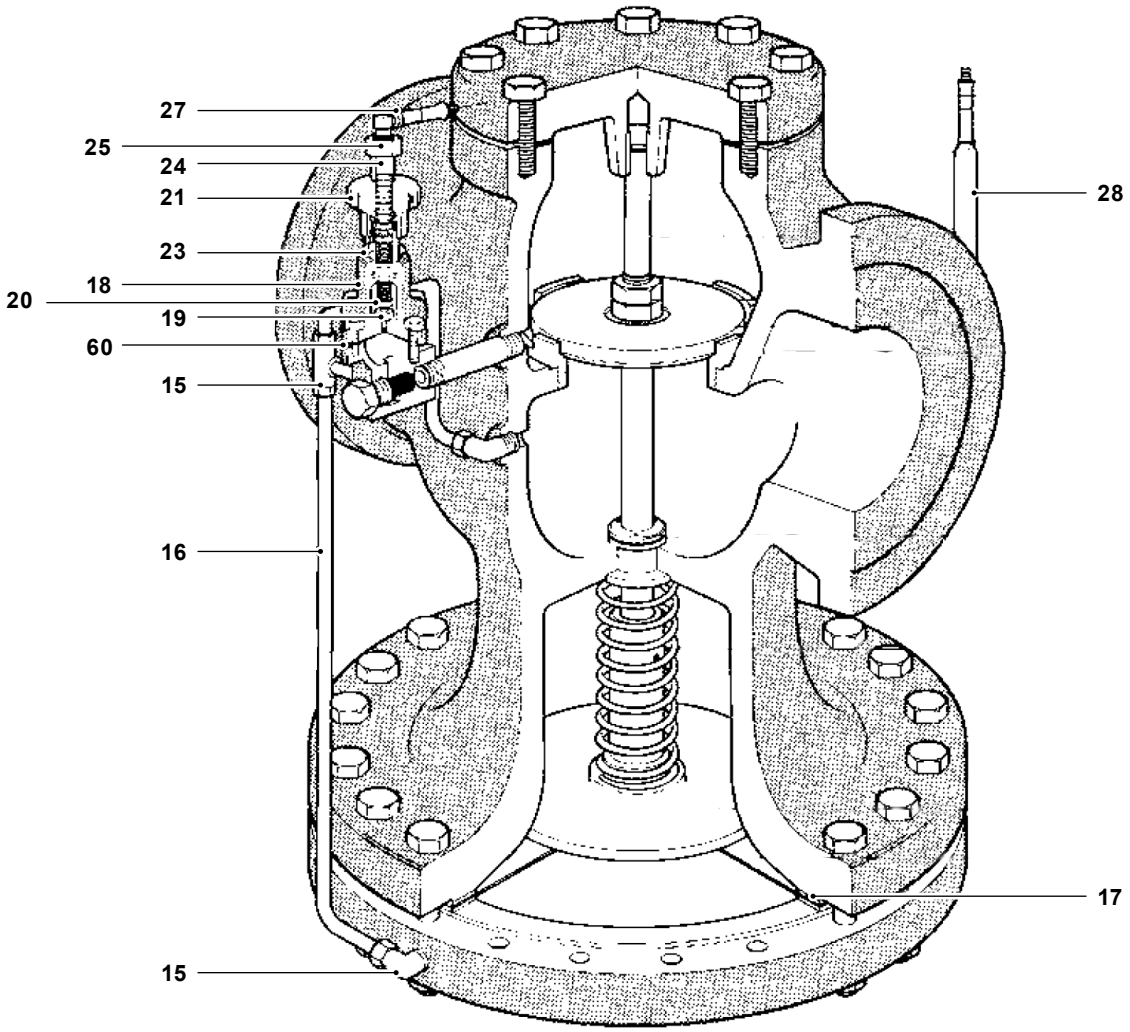


Materials



No.	Part	Material	
1	Valve Body	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B
2	Cover	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B
3	Cover Bolts	Steel	AISI 1038
4	Main Valve Head	Stainless steel	ASTM A 743 CA 40
5	Main Valve Seat	Stainless steel	ASTM A 743 CA 40
7	Valve Return Spring	Stainless steel	AISI 302
8	Valve Stem	Stainless steel	AISI 304
10	Cover Gasket	Graphite	BS 2815 A
11	Stem Bushing	Brass	ASTM B 16
12	Lower Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B
13	Diaphragm Plate	Stainless steel	ASTM A 743 CA 40
14	Main Diaphragm (2 ply)	Stainless steel	ASTM A240

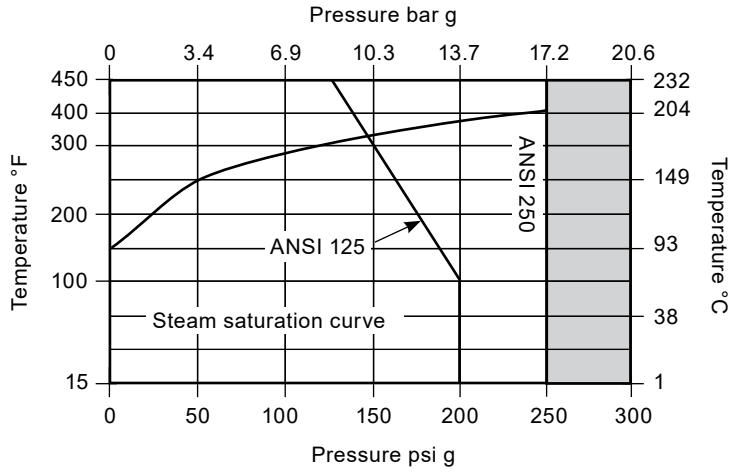
Materials (continued)



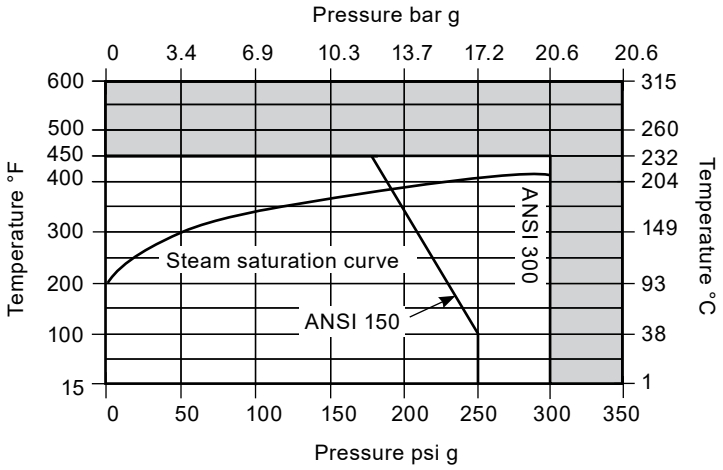
No.	Part	Material	
15	Orifice	Brass	ASTM B16
16	Tubing Assembly	Copper	ASTM B280 (122)
17	Diaphragm Gasket	Graphite	BS 2815 A
18	Pilot Valve Body	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A 216 WC B
19	Pilot Valve Seat	Stainless steel	AISI 303
20	Pilot Valve Head	Stainless steel	AISI 440A
21	Adjustment Knob	Phenolic	ASTM D 700 Ty2
23	Extension Nut	Brass	ASTM B 16
24	Case Tube	Brass	ASTM B 135 (330)
25	Retaining Nut	Brass	ASTM B 16
27	Capillary Tube	Varies with style selected	
28	Bulb	Varies with style selected	
60	Pilot Gasket	Graphite	

Limiting operating conditions

Cast iron



Cast steel



The product **should not** be used in shaded area.

*The temperature of the sensing bulb must not exceed 350 °F (177 °C)

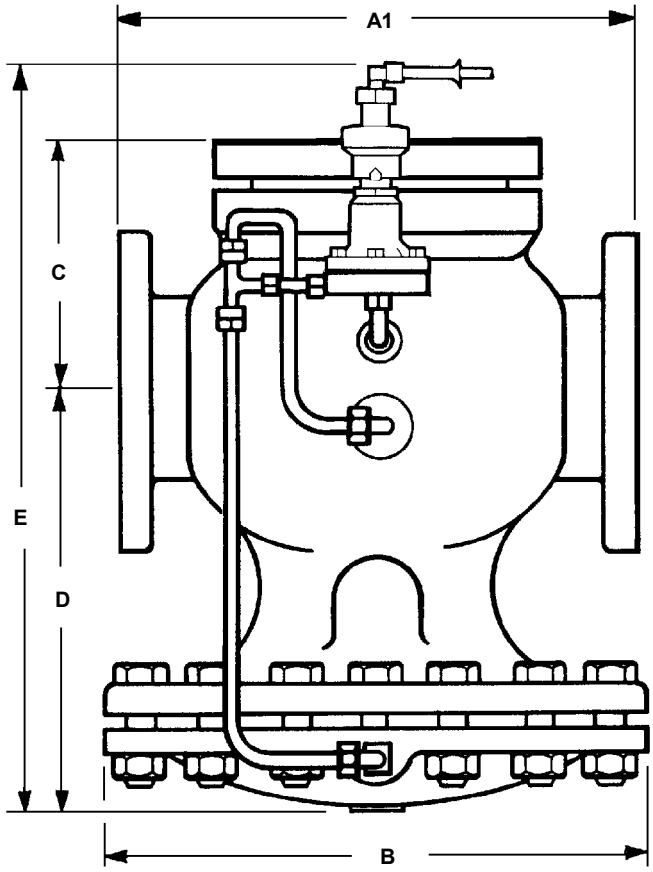
Standard temperature ranges

30 °F to 90 °F	(0 °C to 32 °C)
60 °F to 120 °F	(16 °C to 49 °C)
160 °F to 220 °F	(71 °C to 104 °C)
100 °F to 160 °F	(38 °C to 71 °C)
200 °F to 260 °F	(93 °C to 127 °C)
120 °F to 180 °F	(49 °C to 82 °C)
260 °F to 320 °F	(127 °C to 160 °C)

Cv Values

Size	6"	6" "S"
Cv value	280	156

Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)



Size	ANSI 125/150 A1	ANSI 250/300 A1	B	C	D	E	Weight
6"	18.1 (460)	18.9 (480)	19.75 (502)	12.6 (320)	17.1 (434)	29.7 (754)	595 lb (270 kg)

Capacities

The regulator is sized according to the temperature control requirements. For selection and sizing data, see TI-P235-18-US.

Sample Specification

Temperature Regulators shall be of the pilot-actuated, diaphragm-operated type. The main valve shall be single-seated, with hardened stainless steel trim; the valve body shall be cast iron. The pilots shall be removable without disturbing the control connections. The temperature setting shall be adjustable without the use of tools, and the set point shall be indicated on a calibrated dial. The thermostatic system shall be solid fill, and shall incorporate overheat protection.

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the valve. The trap and regulator should both be protected with a strainer separator set. The thermostatic bulb must be carefully located in the medium being heated. Complete installation instructions are given in IM-3-000-US.

Maintenance

Complete installation and maintenance instructions are given in IM-3-000-US and ADVP 3029, a copy of which is supplied with each valve. Available spare parts are shown on TI-P235-02-US and TI-P335-11-US.

TI-P235-13-US
Issue 1

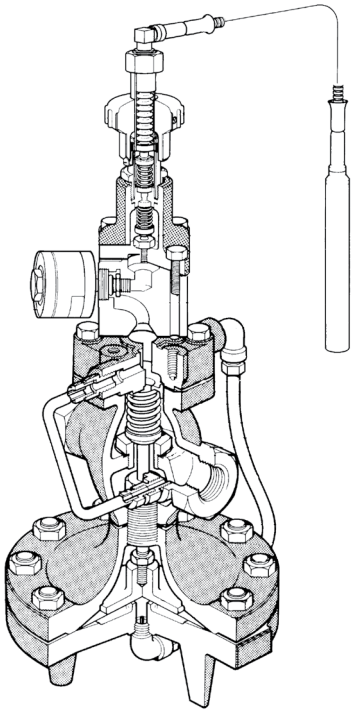
Pilot Operated Temperature Regulator with Electric Override ½" to 4" 25TE

Description

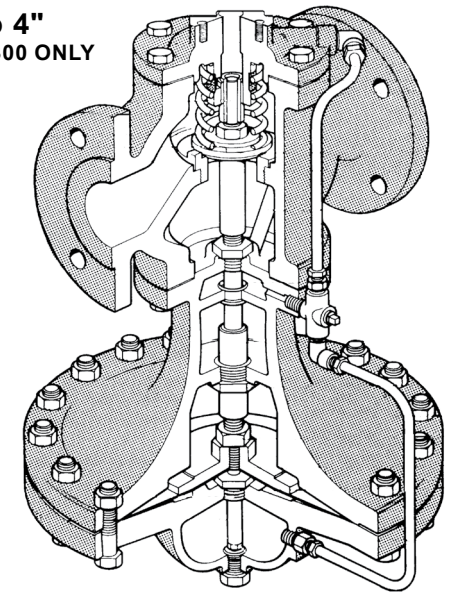
The 25TE has all of the features of the 25T, with the addition of an electric pilot. An electrical signal can override the temperature pilot to provide a remote shut-off capability.
Note: For pressures below 15 psi g (1 bar g), the E pilot is not recommended for use with valves 2½" (DN65) and larger.

Model	**25TE**			
Sizes	½" to 2" (DN15 to DN50)	2½", 3", 4" (DN65, DN80, DN100)	½" to 2" (DN15 to DN50)	2", 2 1/2", 3" 4" (DN50, DN65, DN80, DN100)
Connections	NPT	ANSI 125	NPT	ANSI 300
Construction	Cast iron		Cast steel	
Options		ANSI 250		ANSI 150 (excludes 2")
	Standard capillary tubing available in 8' and 15' lengths. Consult the factory for non-standard capillary tubing lengths available in 5' increments, up to 50' (15 m). (see TI-P235-07-US)			
Electric pilot specifications	Enclosure: NEMA 2, 3, 3S, 4, & 4X 120 VAC / 60 Hz Holding: 23 VAC Inrush: 45 VAC Normally Closed PMO: 200 psi g (13.8 bar g) TMO: 388 °F (198 °C)			
Electric pilot options	240 VAC / 60Hz 24 VAC / 60 Hz For faster response time PMO: 140 psi g (9.7 bar g) TMO: 361 °F (183 °C)			

½" to 2"



2"* to 4"
***ANSI 300 ONLY**



Typical applications

Temperature control applications where the valve must also respond to an electrical program timer, safety or limit switch, or remote manual switch.

Limiting operating conditions

PMO	Maximum operating pressure	NPT	200 psi g (14 bar g) @ 392 °F (200 °C)
		ANSI 125	125 psi g (9 bar g) @ 392 °F (200 °C)
		ANSI 250	200 psi g (14 bar g) @ 392 °F (200 °C)
		ANSI 150	185 psi g (13 bar g) @ 392 °F (200 °C)
		ANSI 300	200 psi g (14 bar g) @ 392 °F (200 °C)
Maximum operating temperature (The temperature of the sensing bulb must not exceed 350 °F (177 °C))			392 °F (200 °C)

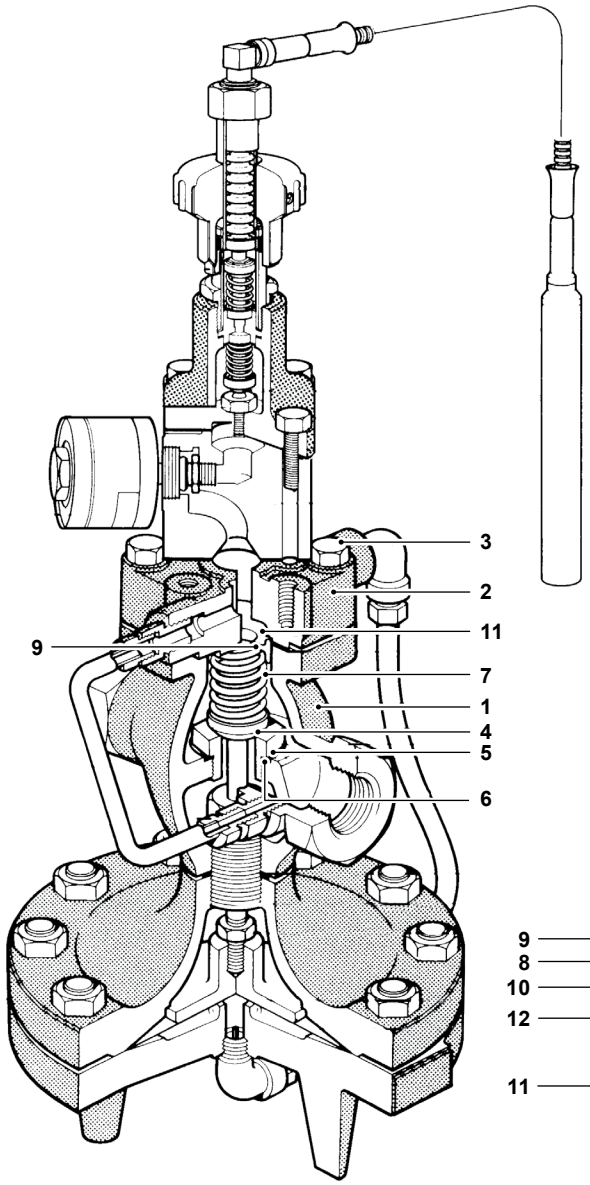
Standard temperature ranges

30 °F to 90 °F	(0 °C to 32 °C)
60 °F to 120 °F	(16 °C to 49 °C)
100 °F to 160 °F	(38 °C to 71 °C)
120 °F to 180 °F	(49 °C to 82 °C)
160 °F to 220 °F	(71 °C to 104 °C)
200 °F to 260 °F	(93 °C to 127 °C)
260 °F to 320 °F	(127 °C to 160 °C)

Pressure shell design conditions

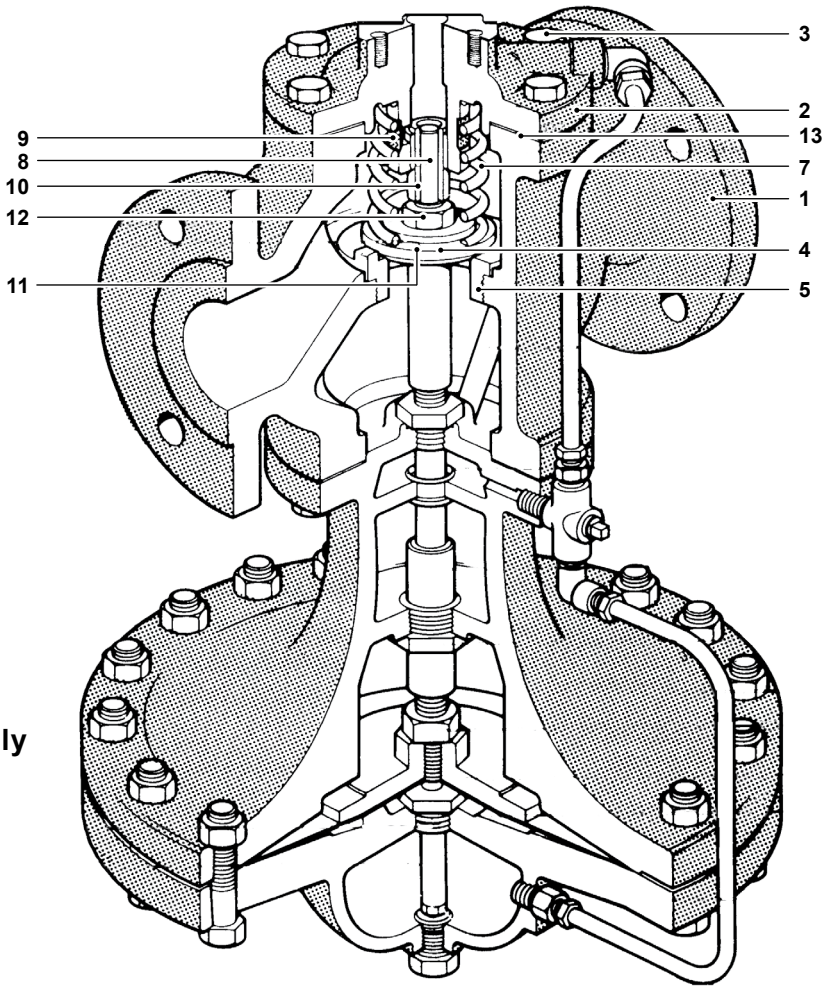
PMA	Maximum allowable pressure	Cast iron	250 psi g @ 450 °F	(17 bar g @ 232 °C)
		Cast steel	300 psi g @ 450 °F	(20 bar g @ 232 °C)
TMA	Maximum allowable temperature	Cast iron	450 °F @ 250 psi g	(232 °C @ 17 bar g)
		Cast steel	450 °F @ 300 psi g	(232 °C @ 20 bar g)

Materials



½" to 2"

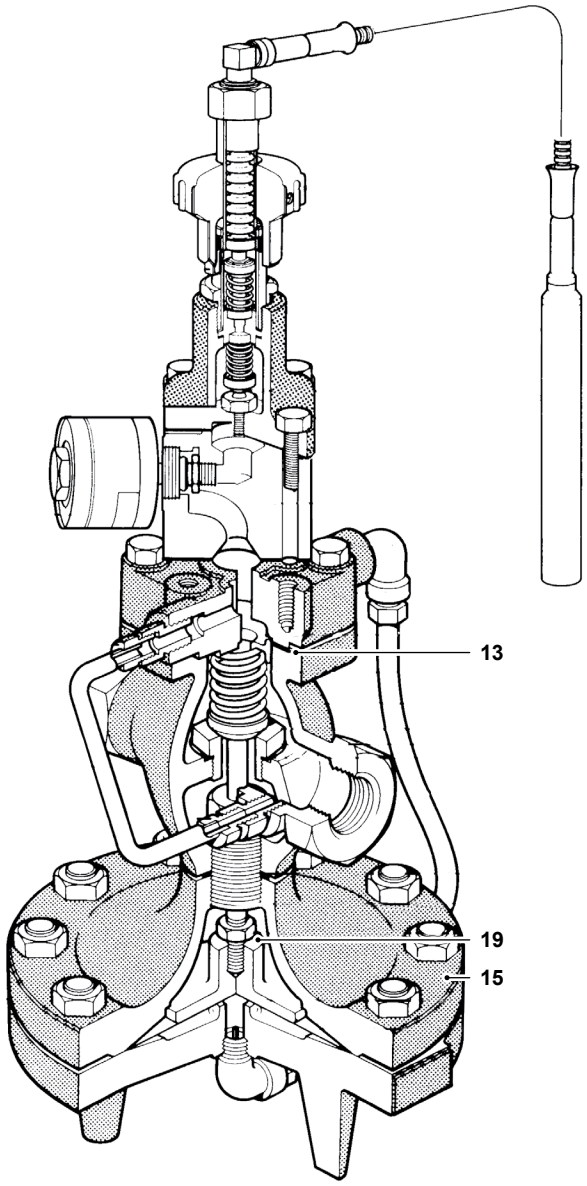
No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
2	Cover	Cast iron	ASTM A 126 CL B
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
7	Valve Return Spring	Stainless steel	
8	Valve Stem	Stainless steel	
9	Strainer Screen	Stainless steel	
10	Valve Stem Sleeve	Stainless steel	
11	Spring Guide	Cast iron ½" - 2" (DN15 to DN50)	
		CRS 2"* - 4" (DN50 to DN100)	
12	Nut	Steel	



2"* to 4" *ANSI 300 only

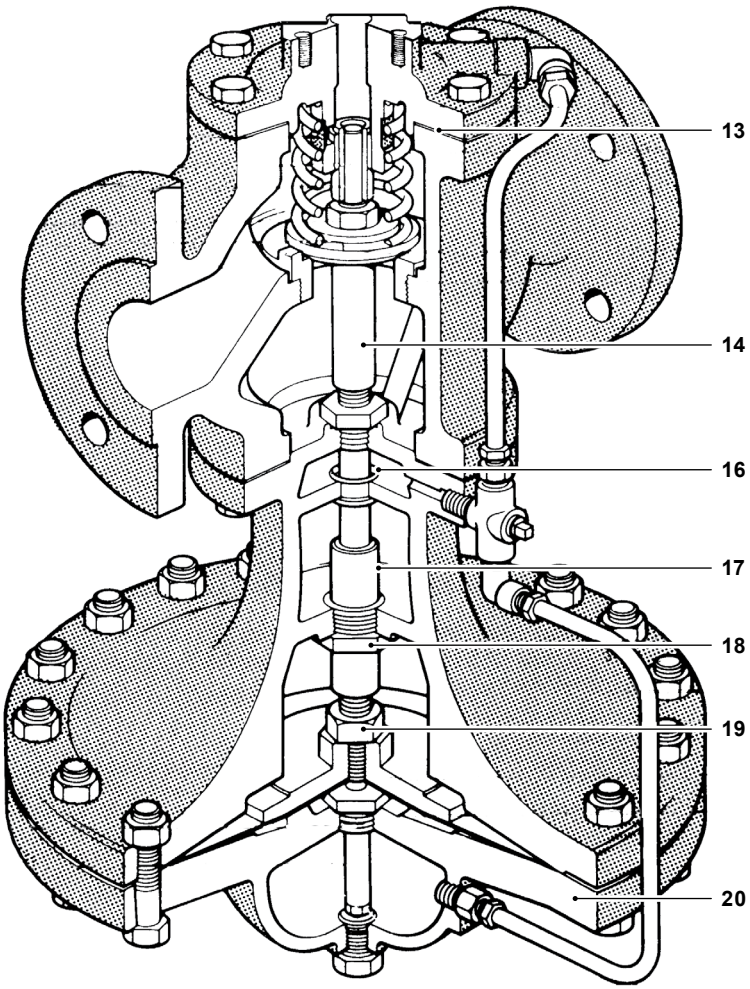
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Materials (continued)



½" to 2"

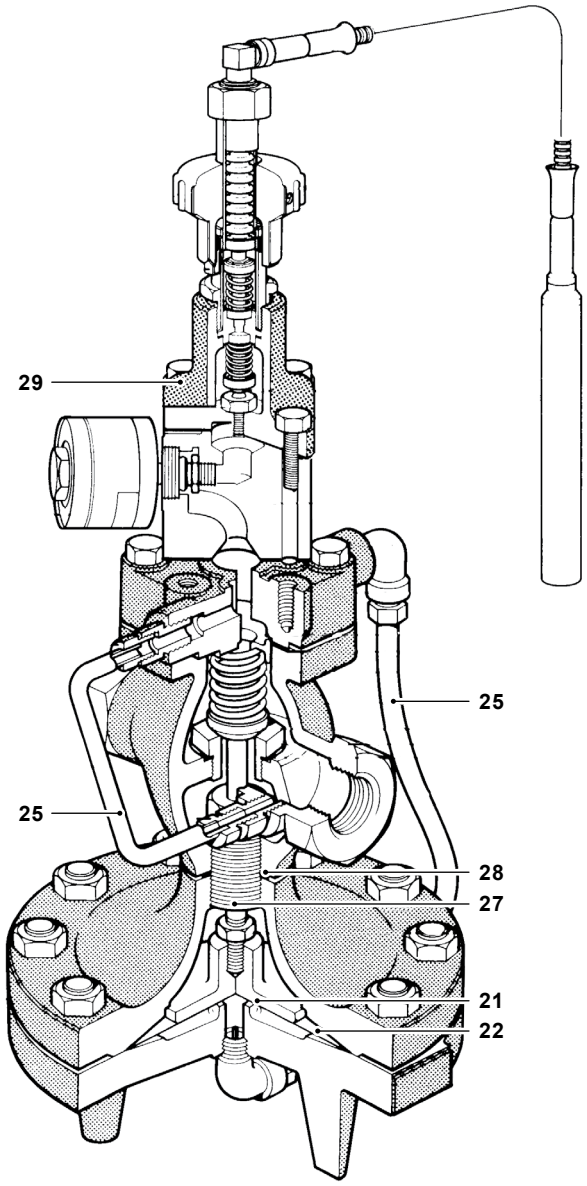
No.	Part	Material	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless steel	
15	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
16	Stem Bushing	Stainless steel	
		2½" - 4" (DN65 to DN100) Cast steel only	
17	Diaphragm Plate Stem	Stainless steel	
18	Diaphragm Stem Guide	Stainless steel	
19	Nut	Brass ½" - 2" (DN15 to DN50)	
		Steel 2"* - 4" (DN50 to DN100)	
20	Lower Diaphragm Case	Cast iron	ASTM A126CL B
		Cast steel	ASTM A216 Gr WCB



2"* to 4" *ANSI 300 only

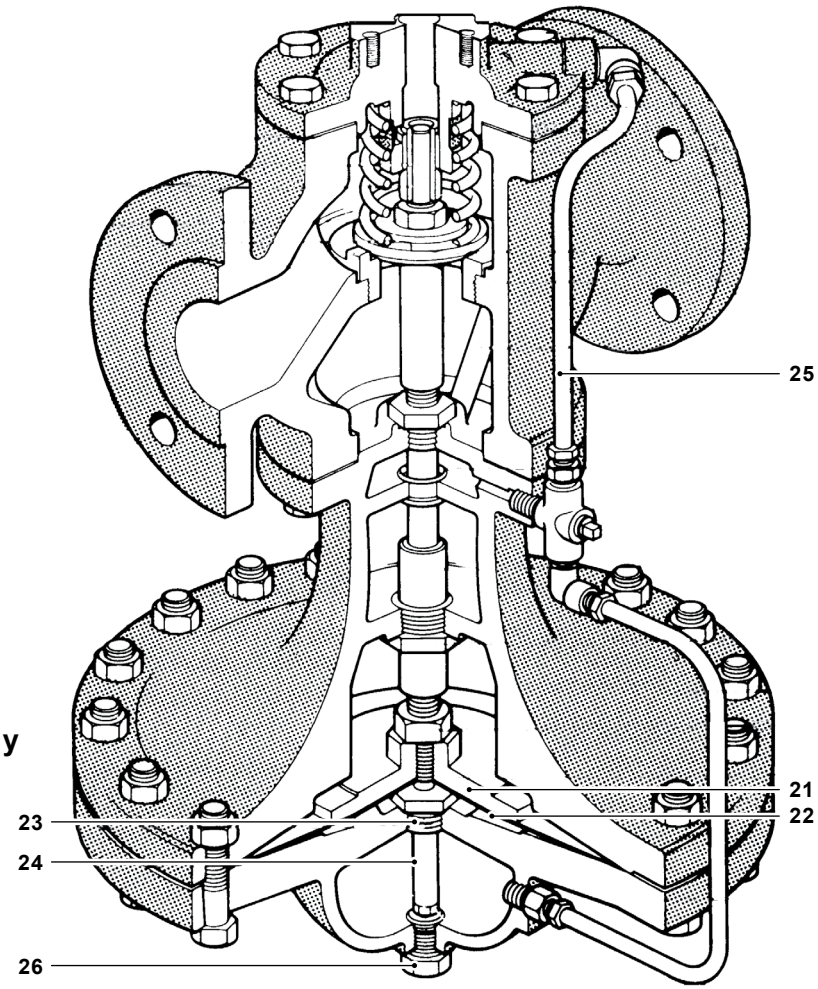
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Materials (continued)



½" to 2"

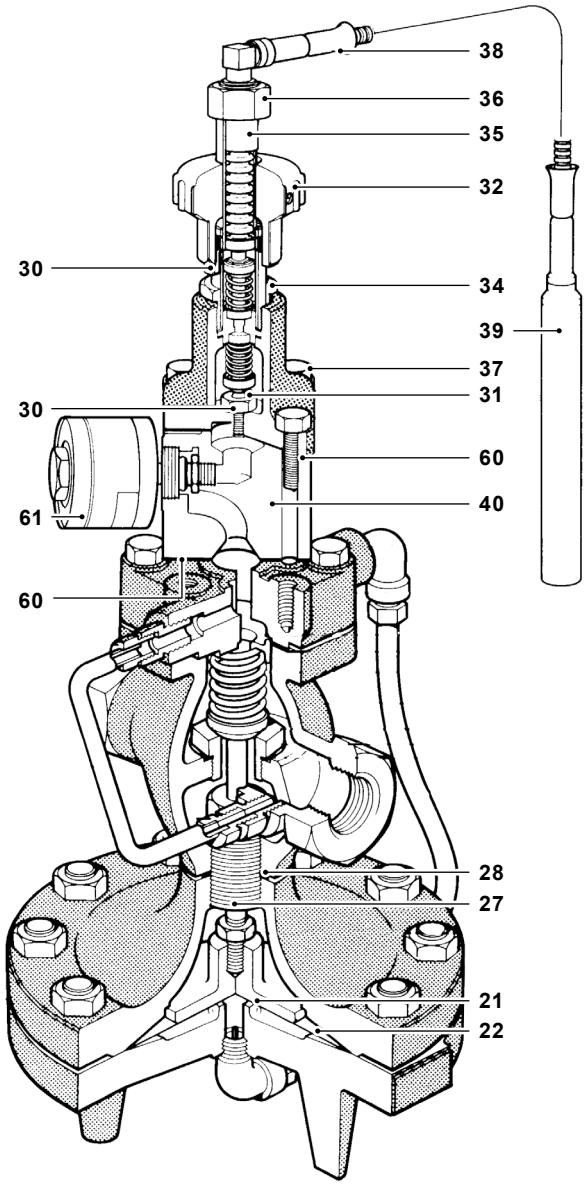
No.	Part		Material	
21	Diaphragm Plate		Brass ½" - 2" (DN15 to DN50)	
			C.I. 2"* - 4" (DN50 to DN100)	
22	Main Diaphragm (2 ply)		Stainless steel	ASTM A240
23	Bushing		CRS	
24	Tube and Orifice		Stainless steel	
25	Tubing Assembly		Copper	
			Brass	
26	Plug	(Cast iron)	Brass	
		(Cast steel)	Steel	
27	Connector Stud		Stainless steel	
28	Body Gasket		½" - 2" (DN15 to DN50) Copper Clad	
			2"* - 4" (DN50 to DN100) Graphite	
29	Pilot Valve Body		Cast iron	ASTM A 126 CL B
			Cast steel	ASTM A216 Gr WCB



2"* to 4" *ANSI 300 only

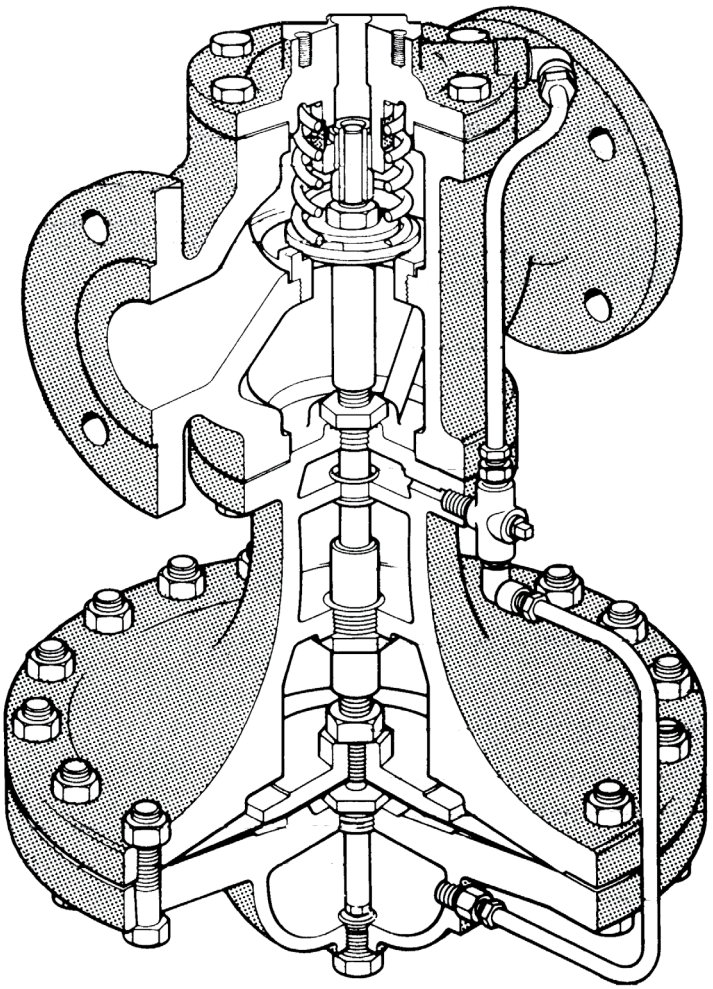
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Materials (continued)



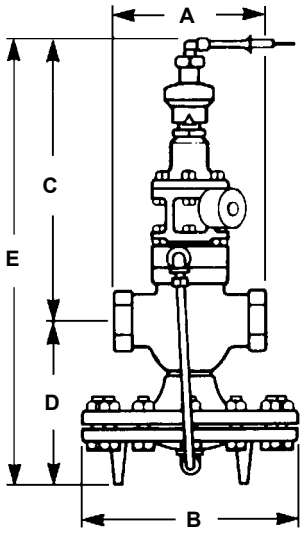
½" to 2"

No.	Part	Material
30	Pilot Valve Seat	Stainless steel
31	Pilot Valve Head	Stainless steel
32	Adjustment Knob	Phenolic
33	Pointer	Stainless steel
34	Extension Nut	Brass
35	Case Tube	Brass
36	Retaining Nut	Brass
37	Pilot Mounting Screws	Steel
38	Capillary Tube	Varies with sytle selected
39	Bulb	Varies with style selected
40	Electric Pilot Body	Cast iron
		Cast Bronze
60	Pilot Gasket	Graphite
61	Electric Solonoid Valve	

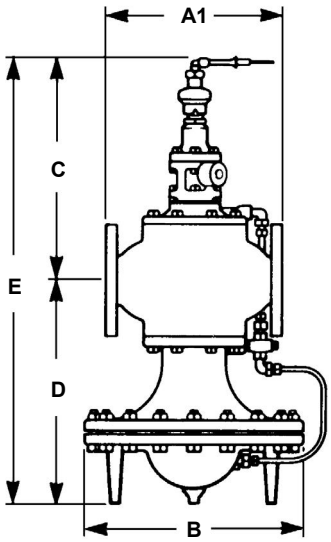


2"* to 4" *ANSI 300 only

Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)



½" to 2"



2"* to 4"

Size	A	ANSI 125 ANSI 150 A1	ANSI 250 ANSI 300 A1	B	C	D	E	Weight	
								Cast iron	Cast steel
½", ¾"	5.5 (140)			7.6 (193)	12.1 (307)	6.2 (157)	18.25 (464)	30.5 lb (13.8 kg)	33 lb (15 kg)
1"	6.0 (152)			8.6 (218)	12.0 (305)	6.75 (171)	18.75 (476)	37.5 lb (17 kg)	41 lb (18.6 kg)
1¼", 1½"	7.25 (184)			8.6 (218)	12.6 (320)	7.1 (180)	19.6 (498)	43 lb (19.5 kg)	47 lb (21.3 kg)
2"	8.5 (216)		9.0 (229)	10.6 (269)	13.2 (335)	8.2 (208)	21.4 (544)	67.5 lb (30.6 kg)	74 lb (33.6 kg)
2½"		10.9 (277)	11.5 (292)	13.6 (345)	13.9 (353)	13.9 (353)	27.9 (709)	156 lb (70.8 kg)	170 lb (77.1 kg)
3"		11.75 (298)	12.5 (318)	13.6 (345)	13.9 (353)	14.4 (366)	28.4 (721)	187 lb (84.8 kg)	204 lb (92.5 kg)
4"		13.9 (353)	14.5 (368)	15.6 (396)	15.1 (384)	16.1 (409)	31.2 (792)	283 lb (128 kg)	308 lb (140 kg)

Capacities

The valve is sized according to the temperature control requirements. For selection and sizing data, see TI-P235-18-US.

Sample specification

The pressure reducing valves shall be of the pilot-actuated diaphragm operated type with electric override. The main valve shall be single-seated with hardened stainless steel trim; the valve body shall be cast iron (cast steel). The pilots shall be bolted directly to the valve body and shall be removable without disturbing the control connections The temperature setting shall be adjustable without the use of tools, and the set point shall be indicated on a calibrated dial. The thermostatic system shall be solid-fill, and shall incorporate over heat protection. The electric pilot shall have a NEMA 2, 3, 3S, 4, & 4X enclosure with 120 VAC / 60 Hz coil.

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the valve. The trap and regulator should both be protected with a strainer. The thermostatic bulb must be carefully located in the medium being heated. Complete installation instructions are given in IM-3-017-US.

Maintenance

Complete installation and maintenance instructions are given in IM-3-017-US, a copy of which is supplied with each valve. Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

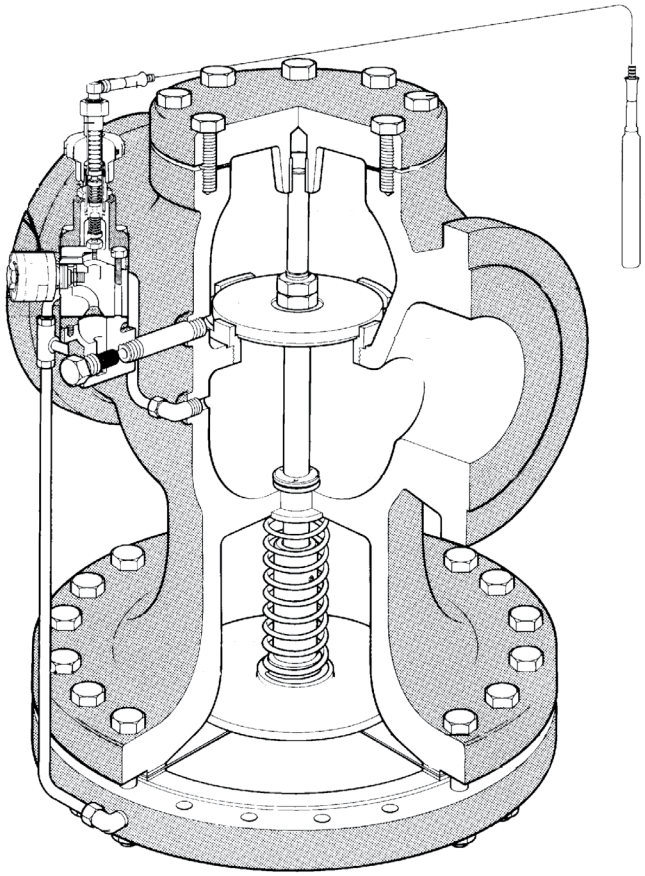
TI-P305-01-US
Issue 1

Pilot Operated Temperature Regulator with Electric Override 6" 25TE

Description

The 25TE has all the features of the 25T with the addition of an electric pilot. An electrical signal can override the temperature pilot. This valve meets Class IV shut-off specifications but is not suitable for dead-end service. Standard capillary tubing lengths are 8ft (2.4 meters) and 15ft (4.6 meters).

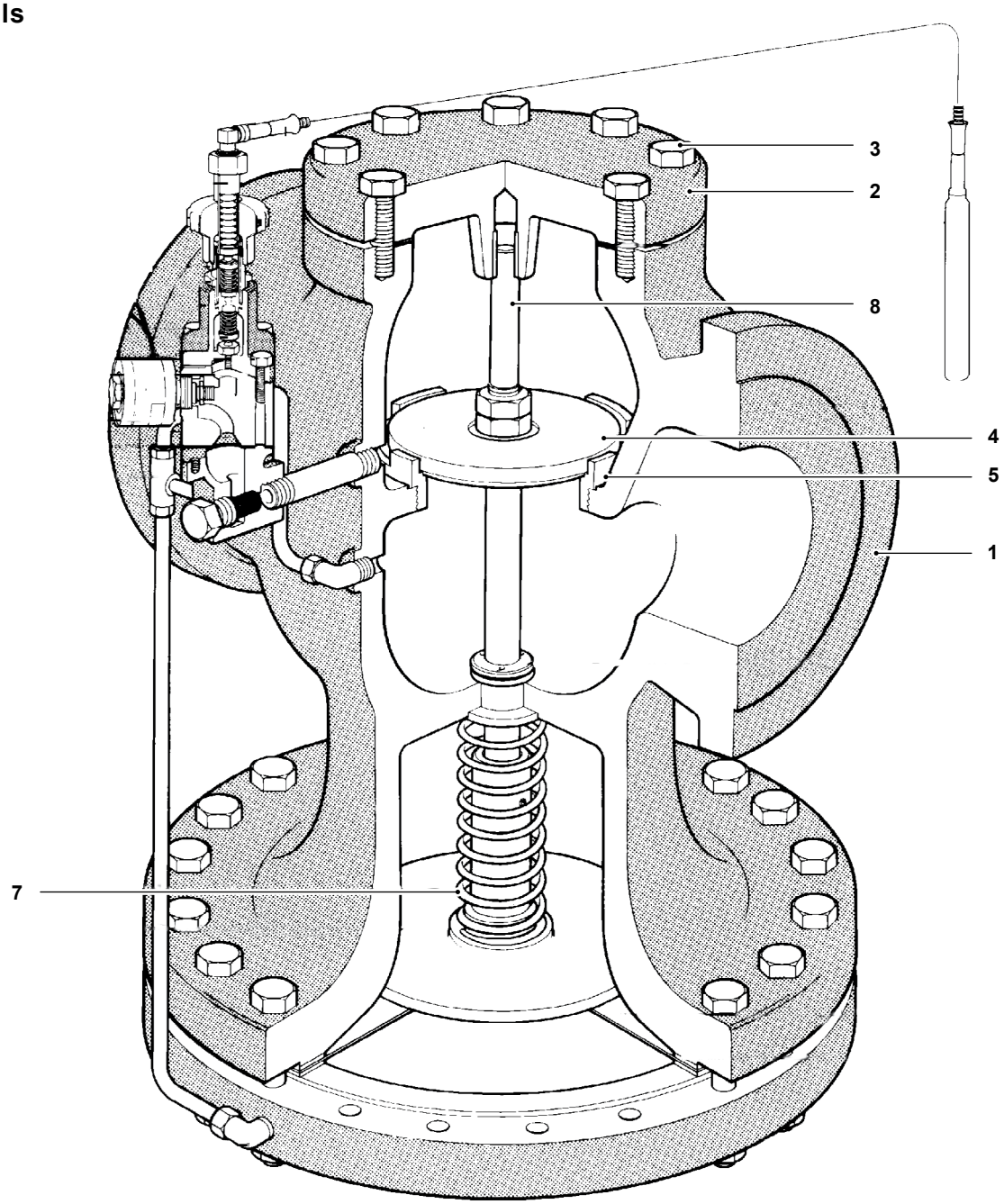
Model	**25TE**	
Sizes	6"	
Connections	ANSI 125, 250	ANSI 150, 300
Construction	Cast iron	Cast steel
Options	Reduced Orifice Designated by "S" Non-Standard capillary tubing length in 5 ft. (1.5 m) intervals to a maximum of 50 ft. (See TI-P235-07-US)	
Electric pilot specifications	Enclosure: NEMA 4 and 7 (CandD) 115v/60Hz Holding: 23 VA Inrush: 45 VA Normally closed 200 psi g (14 bar g) Maximum operating pressure	
Electric pilot options	140 psi g (10 bar g) Maximum operating pressure (for faster response time) 230 volt coil	



Typical applications

Temperature control applications where the valve must also respond to an electrical program timer, safety or limit switch, or remote manual switch.

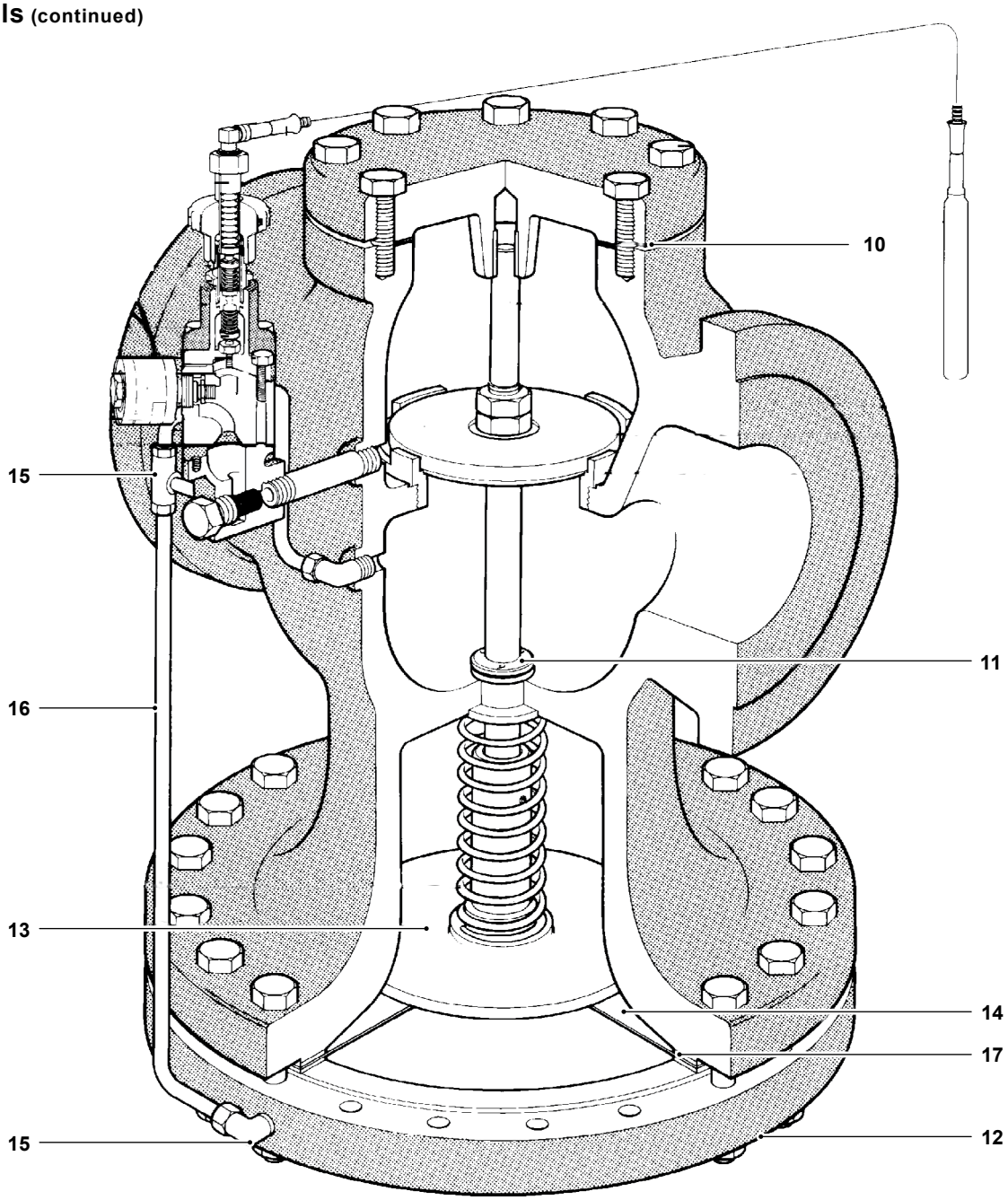
Materials



No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
3	Cover Bolts	Steel	AISI 1038
4	Main Valve Head	Stainless steel	ASTM A 743 CA 40
5	Main Valve Seat	Stainless steel	ASTM A 743 CA 40
7	Valve Return Spring	Stainless steel	AISI 302
8	Valve Stem	Stainless steel	AISI 304

Materials continued on next page

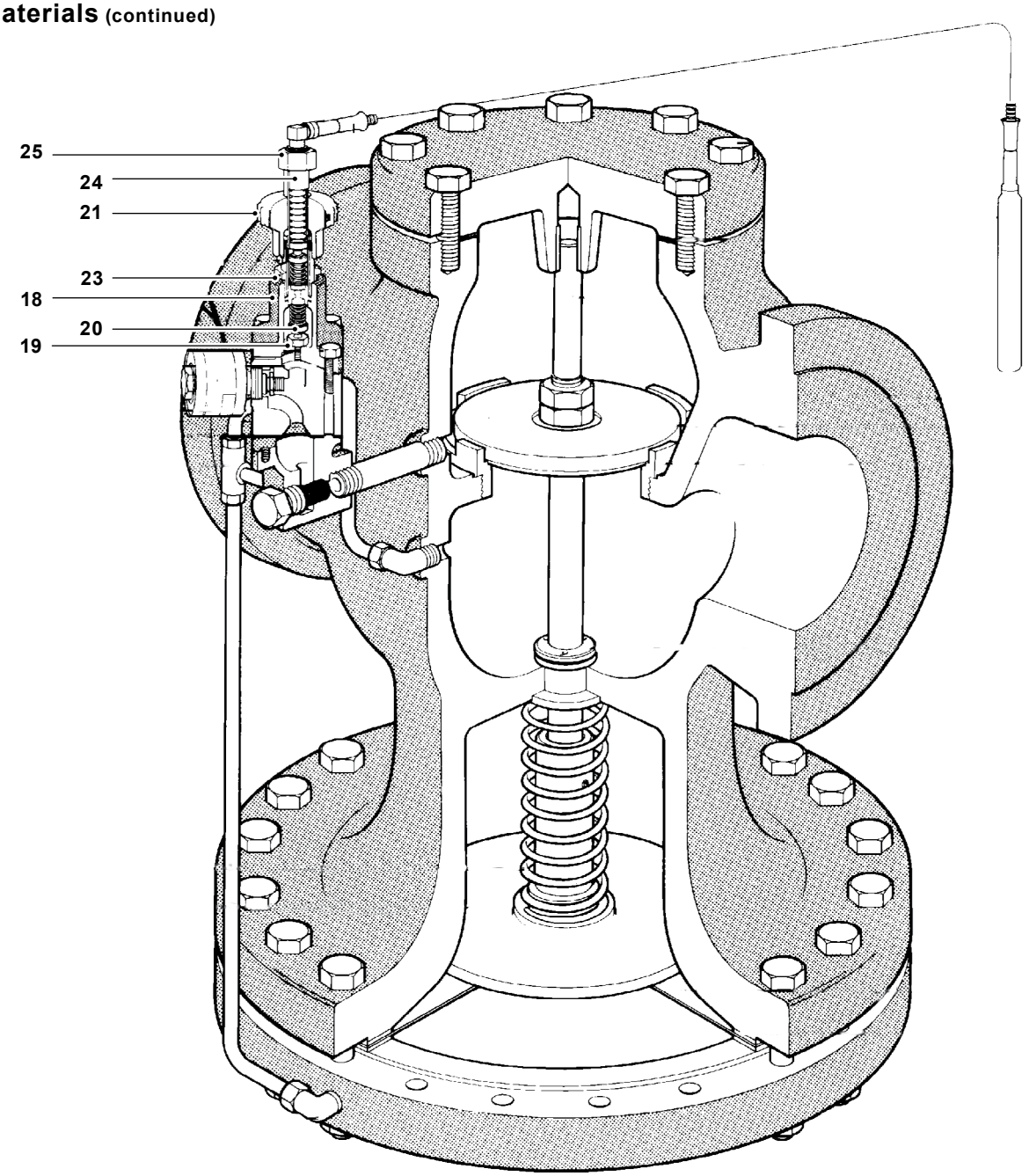
Materials (continued)



No.	Part	Material	
10	Cover Gasket	Graphite	BS 2815A
11	Stem Bushing	Stainless steel	
12	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
13	Diaphragm Plate	Stainless steel	ASTM A 743 CA 40
14	Main Diaphragm (2 ply)	Stainless steel	ASTM A240
15	Tube and Orifice	Brass	ASTM B16
16	Tubing Assembly	Copper	ASTM B280 (122)
17	Diaphragm Gasket	Graphite	BS 2815A

Materials continued on next page

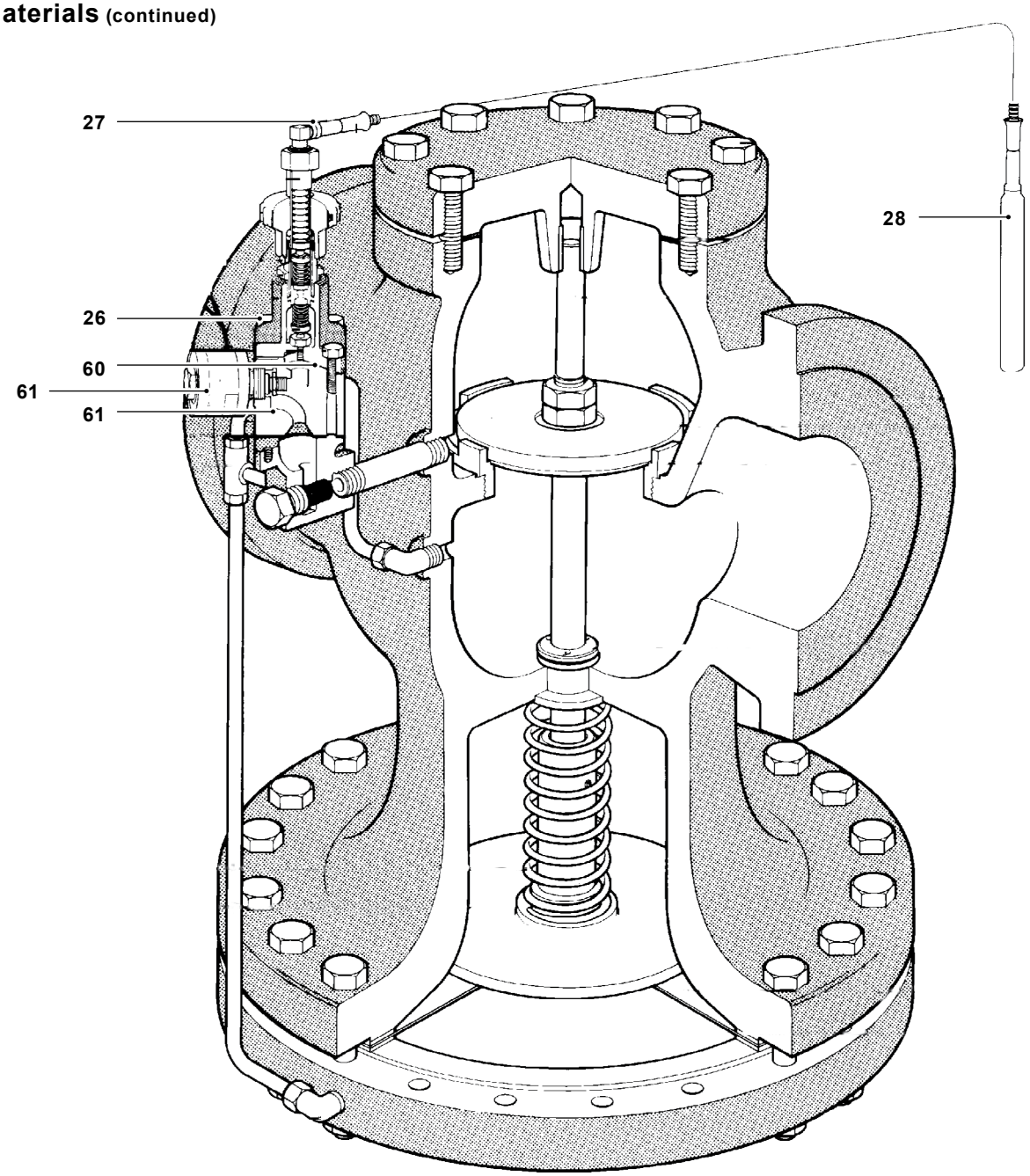
Materials (continued)



No.	Part	Material	
18	Pilot Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
19	Pilot Valve Seat	Stainless steel	AISI 303
20	Pilot Valve Head	Stainless steel	AISI 440A
21	Adjustment Knob	Phenolk	ASTM D 700 Ty2
23	Extension Nut	Brass	ASTM B 16
24	Case Tube	Brass	ASTM B 135 (330)
25	Retaining Nut	Brass	ASTM B 16

Materials continued on next page

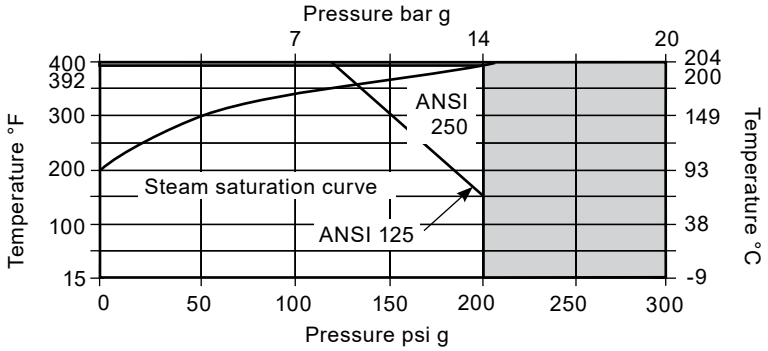
Materials (continued)



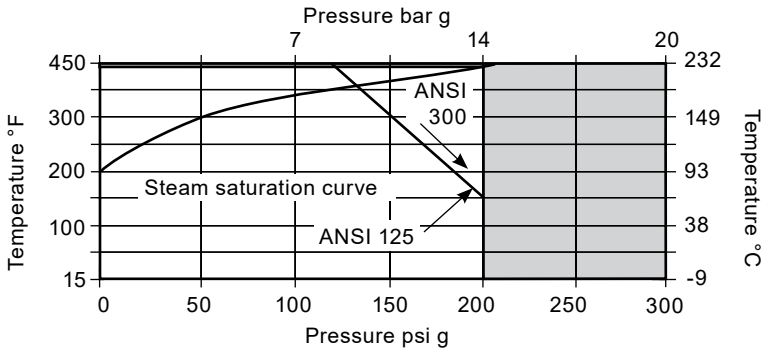
No.	Part	Material	
26	Pilot Mounting Screws	Steel 5⁄16"-18x1	ASTM A449
27	Capillary Tube	Varies with style selected	
28	Bulb	Varies with style selected	
29	Electric Pilot Adaptor	Cast iron	ASTM A126 CL B
60	Pilot Gasket	Graphite	
61	Electric Solenoid Valve		

Limiting operating conditions

Cast iron



Cast steel



The product **should not** be used in shaded area.

*The temperature of the sensing bulb must not exceed 350 °F (177 °C)

Standard temperature ranges

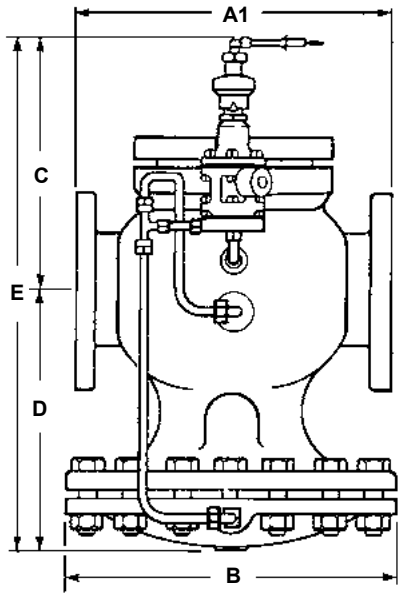
30 °F to 90 °F	(0 °C to 32 °C)
60 °F to 120 °F	(16 °C to 49 °C)
160 °F to 220 °F	(71 °C to 104 °C)
100 °F to 160 °F	(38 °C to 71 °C)
200 °F to 260 °F	(93 °C to 127 °C)
120 °F to 180 °F	(49 °C to 82 °C)
260 °F to 320 °F	(127 °C to 160 °C)

Cv values

Size	6"	6" "S"
Cv value	280	156

* The temperature of the sensing bulb must not exceed 350 °F (177 °C)

Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)



Size	ANSI 125/150 A1	ANSI 250/300 A1	B	C	D	E	Weight
6"	18.1	18.9	19.75	17.2	17.1	34.3	595 lb
	(460)	(480)	(502)	(437)	(434)	(871)	(270 kg)

Sample specification

Temperature Regulators shall be of the pilot-actuated, diaphragm-operated type with electric override. The main valve shall be single-seated, with hardened stainless steel trim; the valve body shall be Cast iron. The pilots shall be removable without disturbing the control connections. The temperature setting shall be adjustable without the use of tools, and the set point shall be indicated on a calibrated dial. The thermostatic system shall be solid fill, and shall incorporate overheat protection. The electric pilot shall have a NEMA 4and7 (CandD) enclosure with 115v (230v) 60 Hz coil.

Capacities

The valve is sized according to the temperature control requirements. For selection and sizing, see TI-P235-18-US.

TI-P235-20-US
Issue 2

Electric Pilot Operated On/Off Regulator ½" to 4" 25E

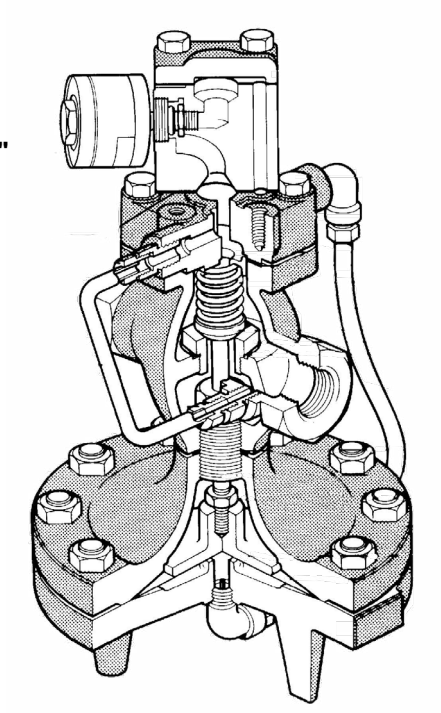
Description

The 25E is controlled by an electric pilot valve. The main valve opens wide when the pilot is energized; it closes tight when the pilot is de-energized. The 25E does not modulate or throttle steam at part load.

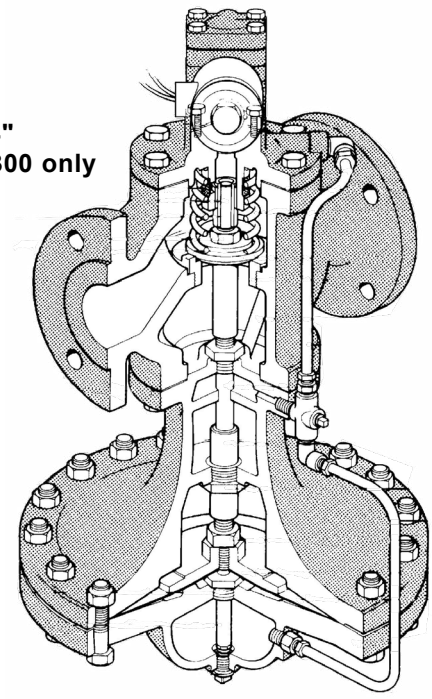
Note: For pressures below 15 psi g, the E pilot is not recommended for use with valves 2½" (DN65) and larger.

Model	**25E**			
Sizes	½" to 2" (DN15 to DN50)	2½", 3", 4" (DN65, DN80, DN100)	½" to 2" (DN15 to DN50)	2", 2½", 3", 4" (DN50, DN65, DN80, DN100)
Connections	NPT	ANSI 125	NPT	ANSI 300
Construction	Cast Iron		Cast Steel	
Options		ANSI 250		ANSI 150 (excludes 2")
Transmission tubing	Copper Tubing		Stainless Steel Tubing	
Electric pilot specifications	Enclosure: NEMA 2, 3, 3S, 4, and 4X 120 VAC / 60 Hz Holding: 23 VAC Inrush: 45 VAC Normally Closed PMO: 200 psi g (13.8 bar g) TMO: 388 °F (198 °C)			
Electric pilot options	240 VAC / 60Hz 24 VAC / 60 Hz For faster response time PMO: 140 psi g (9.7 bar g) TMO: 361 °F (183 °C)			

½" to 2"



2"* to 4"
***ANSI 300 only**



Typical applications

On/Off control of steam flow in response to remote manual or automatic electrical signals which may originate at safety switches, timers, manual switches, etc.

Limiting operating conditions

Maximum operating pressure (PMO)	NPT:	200 psi g @ 392 °F	(14 bar g @ 200 °C)
	ANSI 125:	125 psi g @ 392 °F	(8 bar g @ 200 °C)
	ANSI 250:	200 psi g @ 392 °F	(14 bar g @ 200 °C)
	ANSI 150:	185 psi g @ 392 °F	(12 bar g @ 200 °C)
	ANSI 300:	200 psi g @ 392 °F	(14 bar g @ 200 °C)
Maximum operating temperature (TMO)		392 °F	(200 °C)

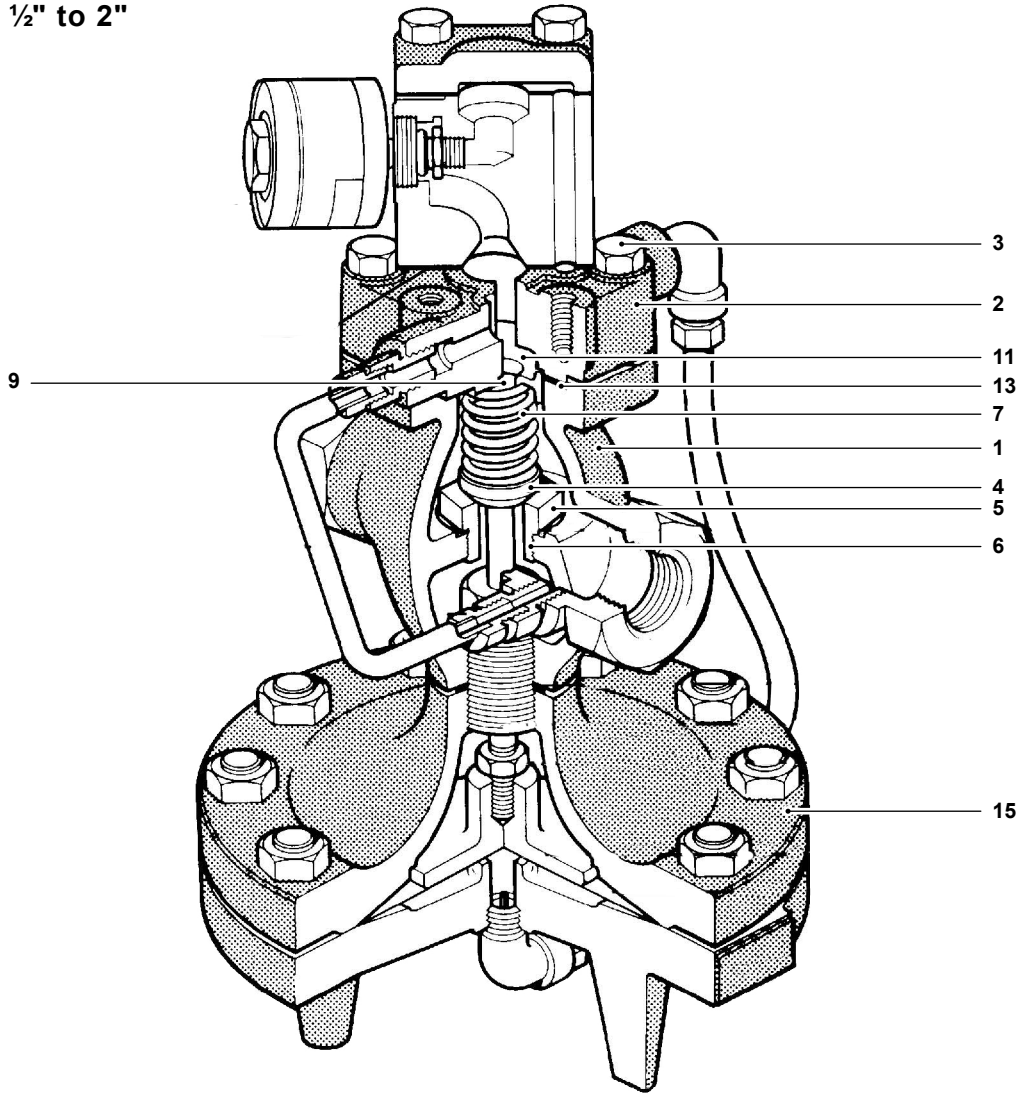
Pressure shell design conditions

PMA Maximum allowable pressure	Cast iron:	250 psi g @ 0-450 °F	(17 bar g @ 0-232 °C)
	Cast steel:	300 psi g @ 0-450 °F	(20 bar g @ 0-232 °C)
TMA Maximum allowable temperature	Cast iron:	450 °F @ 0-250 psi g	(232 °C @ 0-17 bar g)
	Cast steel:	450 °F @ 0-300 psi g	(232 °C @ 0- bar g)

Capacities

For selection and sizing data, see TI-P235-18-US.

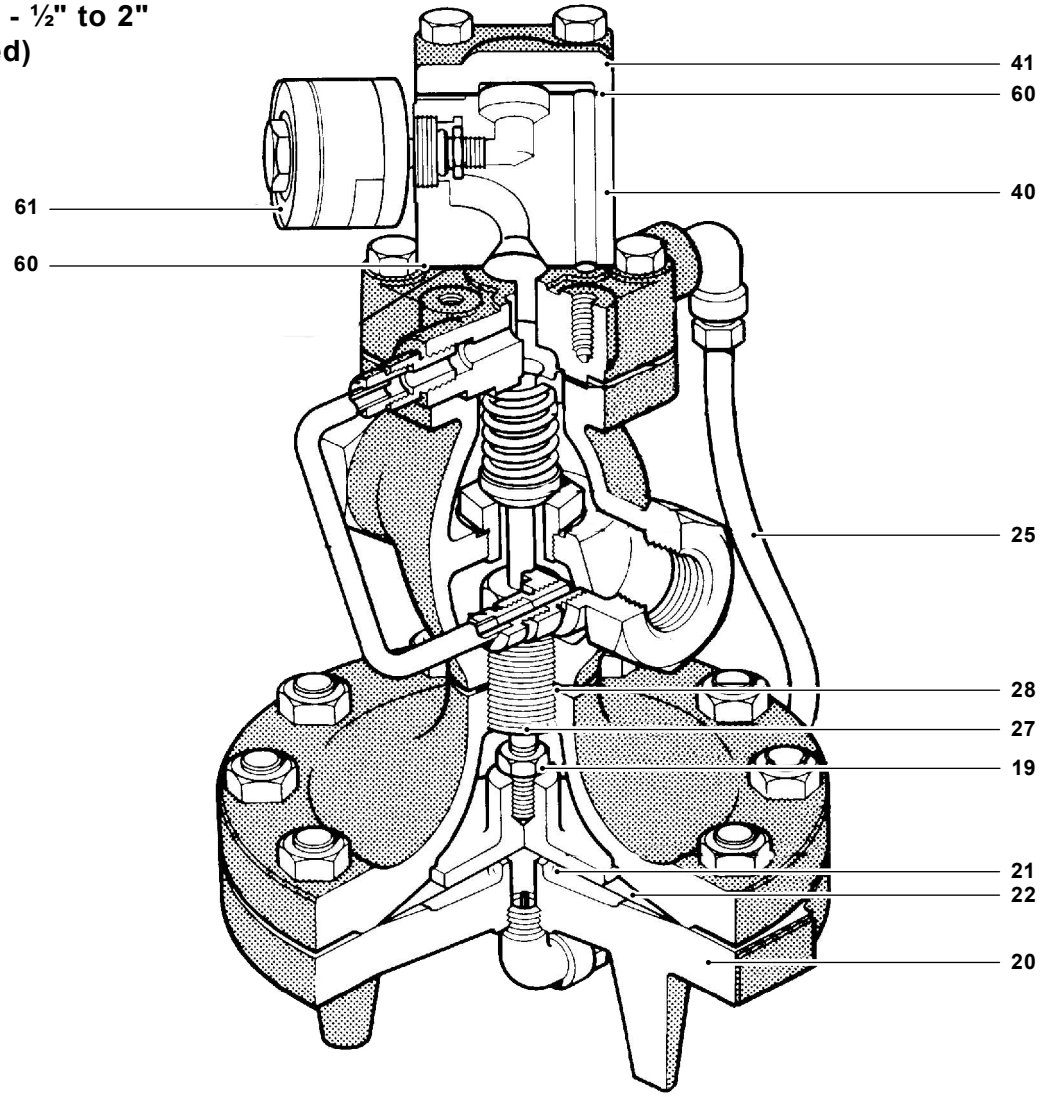
Materials - ½" to 2"



No.	Part	Material	
1	Valve Body	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
2	Cover	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless Steel	
5	Main Valve Seat	Stainless Steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless Steel	
9	Strainer Screen	Stainless Steel	
11	Spring Guide	Cast Iron ½"-2"	
		CRS 2"* - 4"	
13	Cover Gasket	Graphite	
15	Upper Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB

Materials continued on next page

Materials - ½" to 2" (continued)

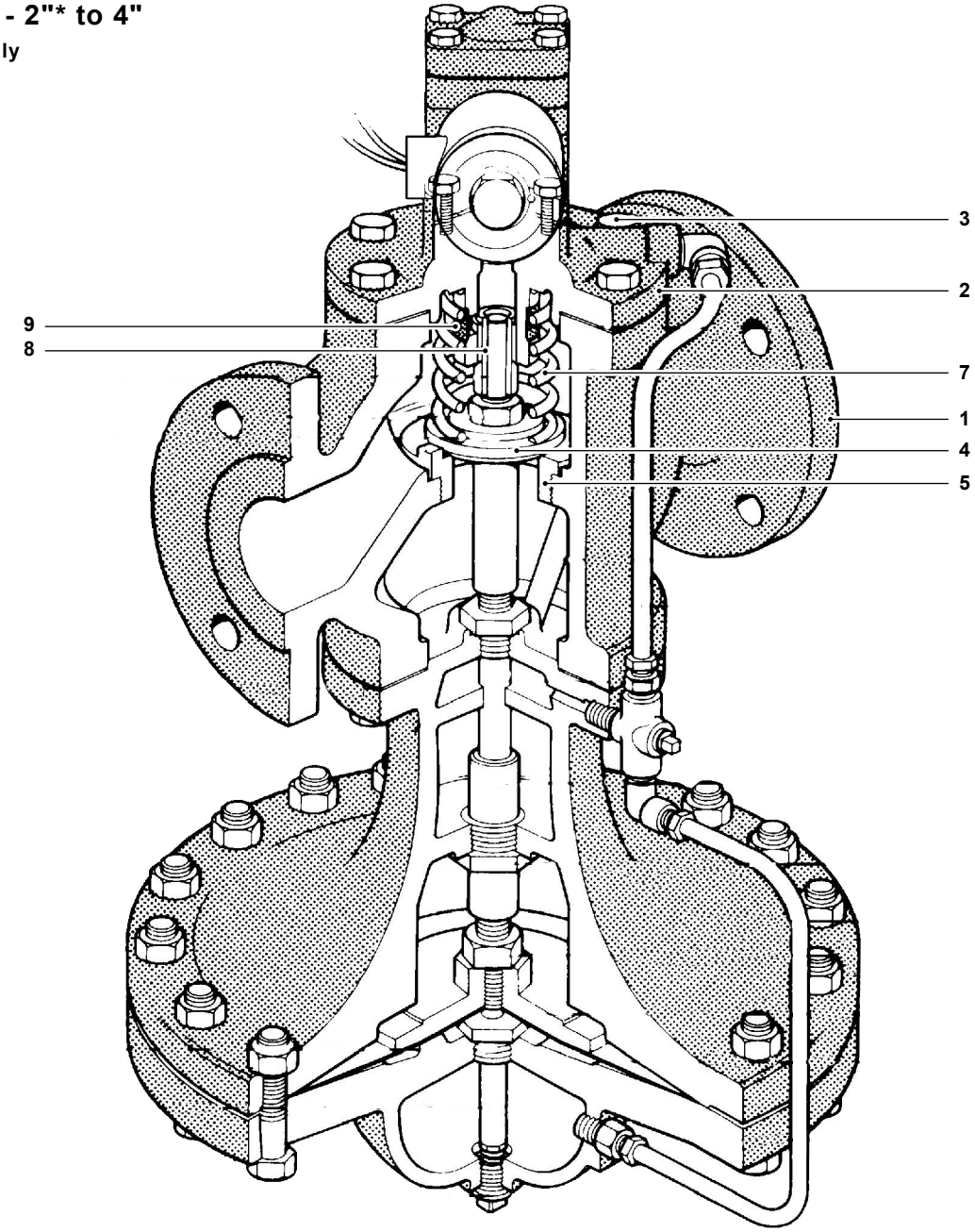


No.	Part	Material	
19	Nut	Brass ½" - 2"	
		Steel 2"* - 4"	
20	Lower Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Brass ½" - 2"	
		C.I. 2"* - 4"	
25	Tubing Assembly Cast Iron	Copper / Brass	
	Tubing Assembly Cast Steel	Stainless Steel	
27	Connector Stud	Stainless Steel	
40	Electric Pilot Body	Cast Iron	ASTM A 126 CL B
		Cast Bronze	ASTM B62
41	Electric Pilot Cover	Cast Iron	ASTM A 126 CL B
42	Cap Screws	Steel	ASTM A449
60	Pilot Gasket	Stainless Steel	
61	Electric Solenoid Valve		

Materials continued on next page

Materials - 2"* to 4"

*ANSI 300 only

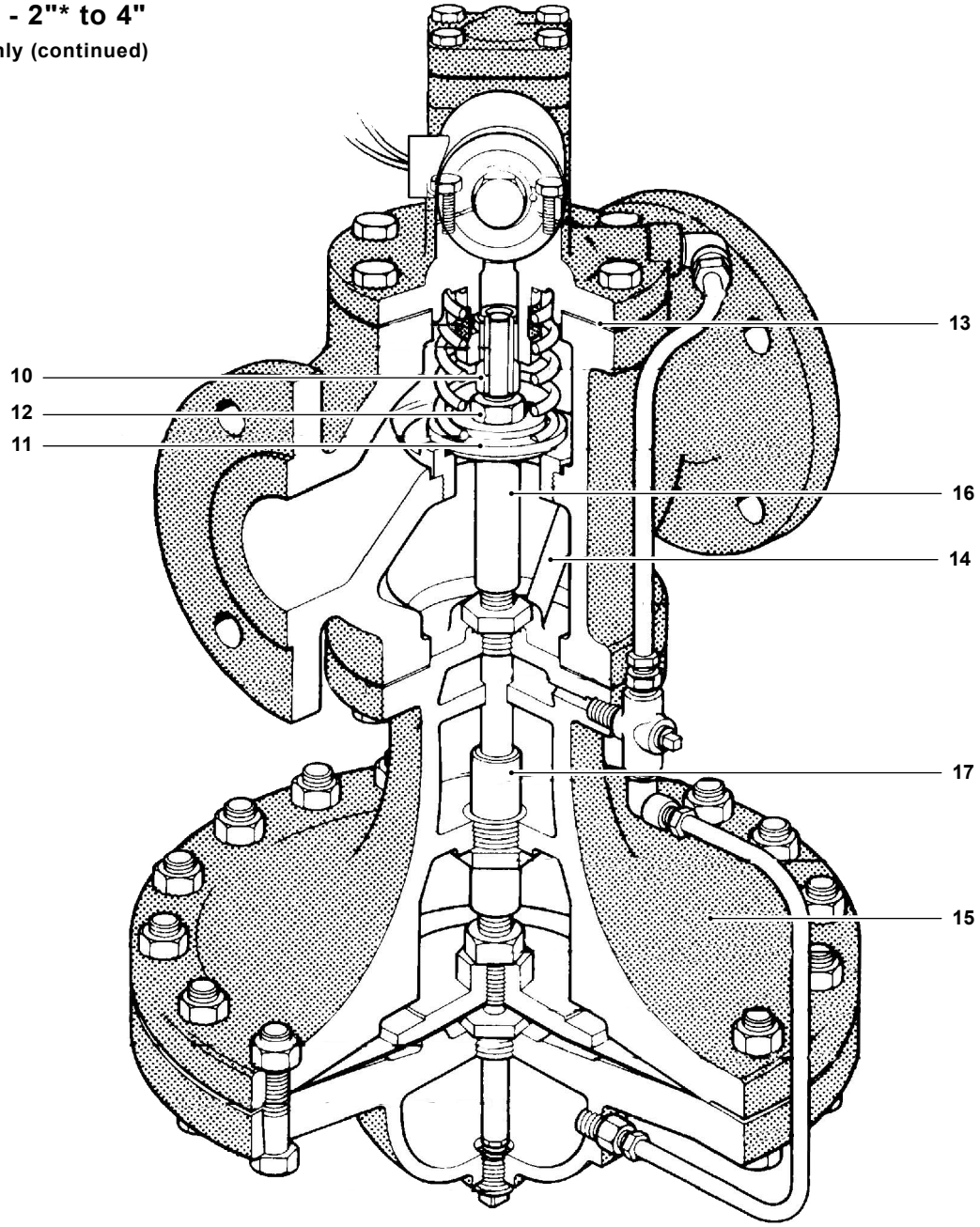


No.	Part	Material	
1	Valve Body	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
2	Cover	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless Steel	
5	Main Valve Seat	Stainless Steel	
7	Valve Return Spring	Stainless Steel	
8	Valve Stem	Stainless Steel	
9	Strainer Screen	Stainless Steel	

Materials continued on next page

Materials - 2"* to 4"

***ANSI 300 only (continued)**

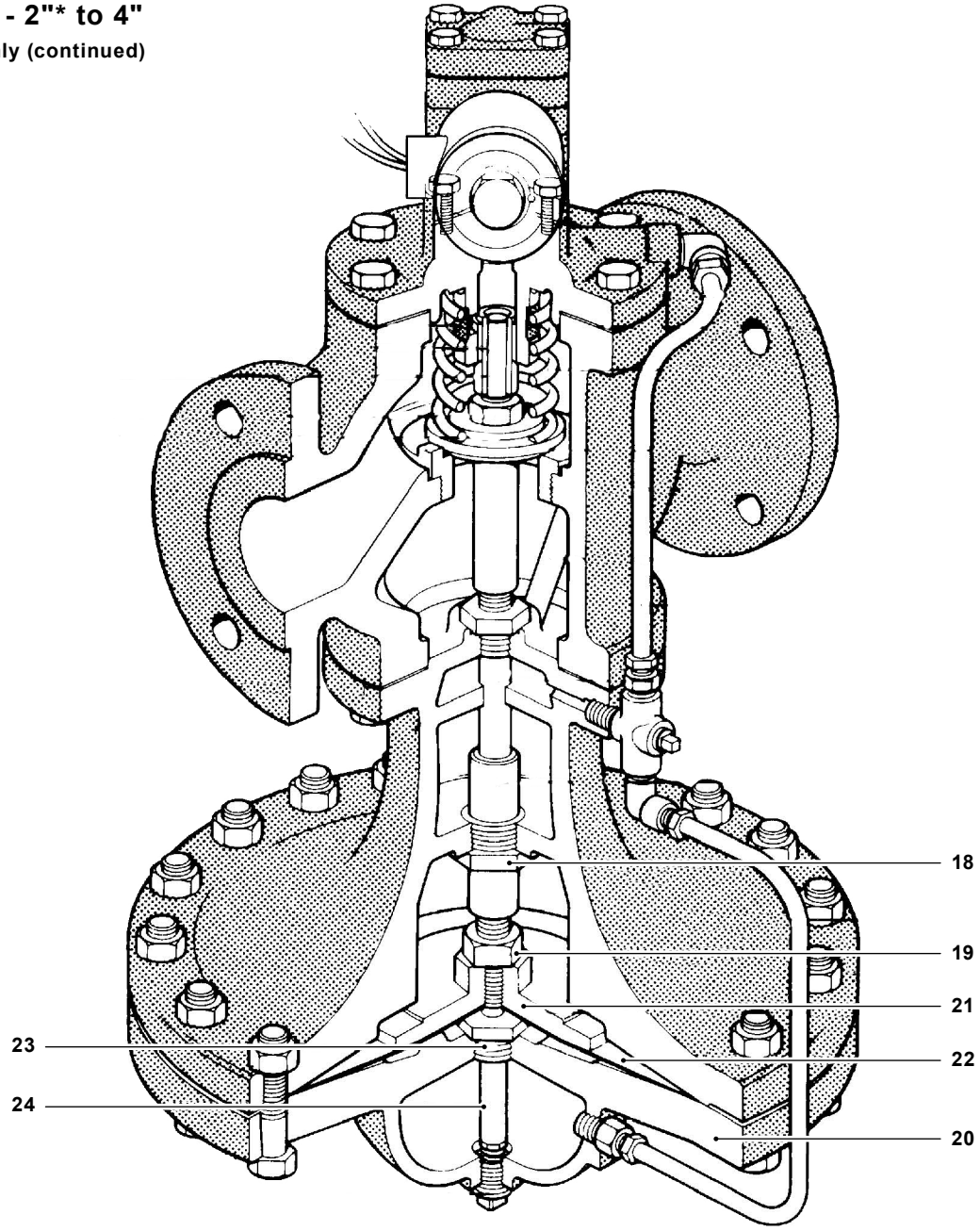


No.	Part	Material	
10	Valve Stem Sleeve	Stainless Steel	
11	Spring Guide	Cast Iron ½"-2"	
		CRS 2"* - 4"	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless Steel	
15	Upper Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
16	Stem Bushing (2-½" - 4" Cast Steel only)	Stainless Steel	
17	Diaphragm Plate Stem	Stainless Steel	

Materials continued on next page

Materials - 2"* to 4"

***ANSI 300 only (continued)**

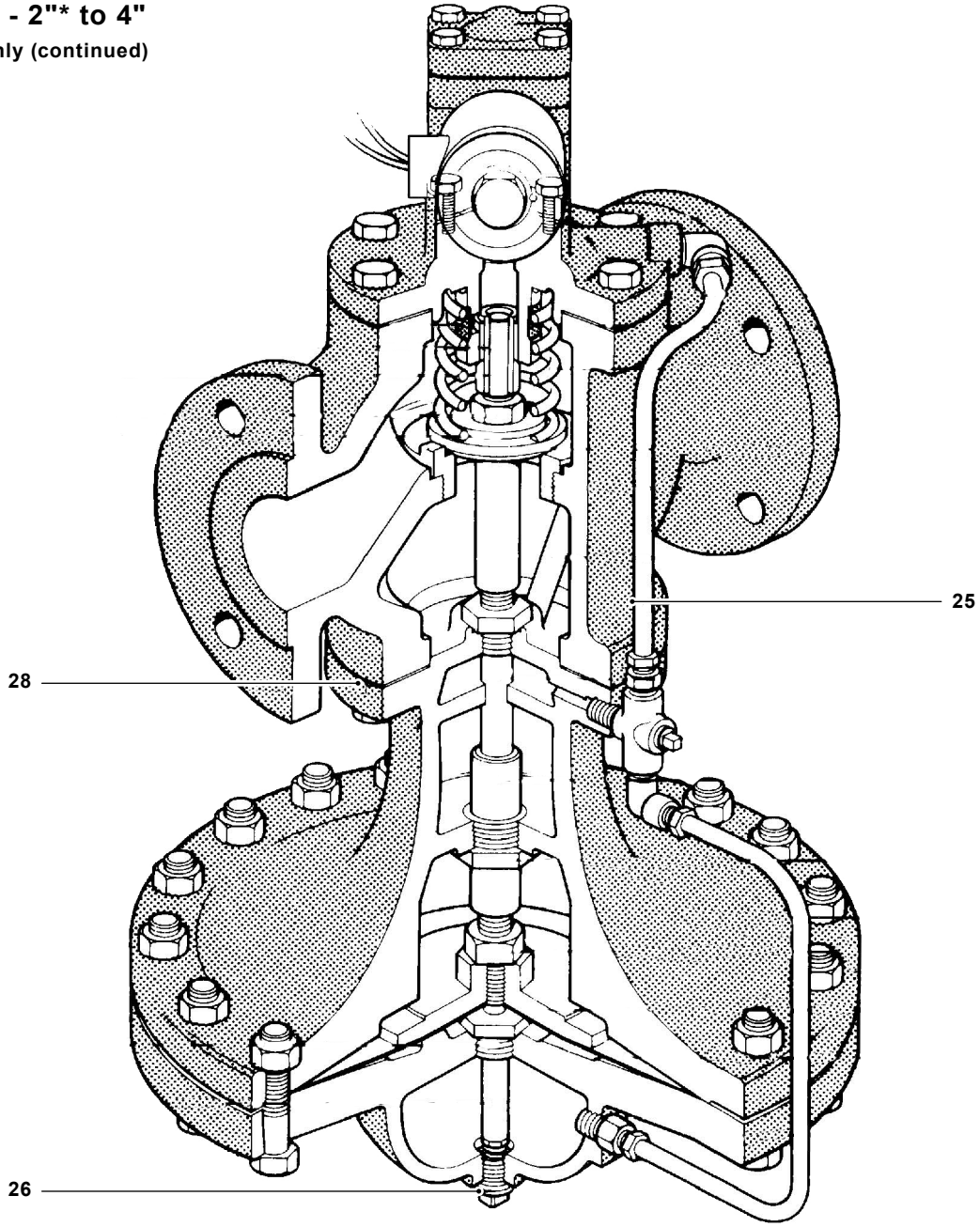


No.	Part	Material	
18	Diaphragm Stem Guide	Stainless Steel	
19	Nut	Brass ½" - 2"	
		Steel 2"* - 4"	
20	Lower Diaphragm Case	Cast Iron	ASTM A 126 CL B
		Cast Steel	ASTM A216 Gr WCB
21	Diaphragm Plate	Brass ½" - 2"	
		C.I. 2"* - 4"	
22	Main Diaphragm (2 ply)	Stainless Steel	
23	Bushing	CRS	
24	Tube and Orifice	Stainless Steel	

Materials continued on next page

Materials - 2"* to 4"

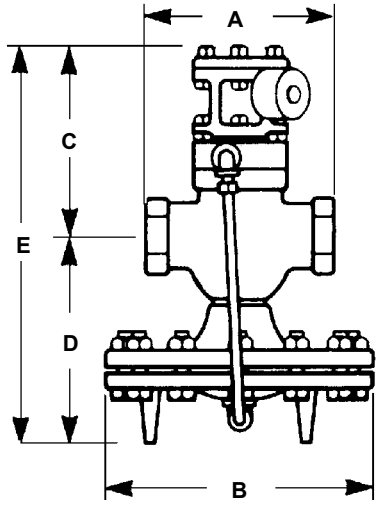
*ANSI 300 only (continued)

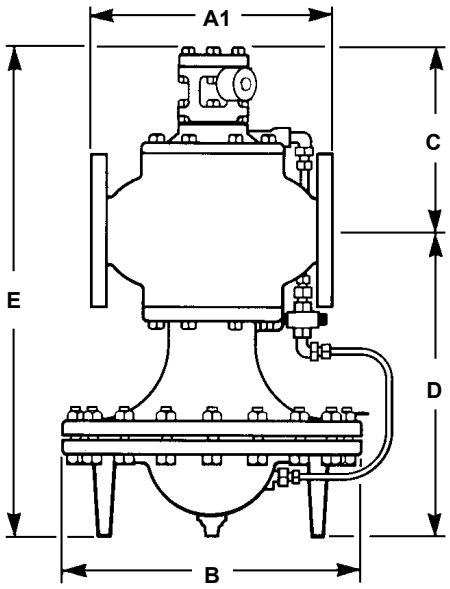


No.	Part	Material
25	Tubing Assembly	Copper
		Brass
26	Plug (Cast Iron)	Brass
	Plug (Cast Steel)	Steel
28	Body Gasket	½" - 2" Copper Clad
		2"* - 4" Graphite

Dimensions/weights (approximate) in inches (mm) and lbs (kg)

½" to 2"





2"* to 4"

Size	A	ANSI 125 ANSI 150 A1	ANSI 250 ANSI 300 A1	B	C	D	E	Weight Cast Iron	Weight Cast Steel
½", ¾"	5.5 (140)			7.6 (193)	6.1 (155)	6.2 (157)	12.25 (311)	28 lb (12.7 kg)	31 lb (14.1 kg)
1"	6.0 (152)			8.6 (218)	6.0 (152)	6.75 (171)	12.75 (324)	35 lb (15.9 kg)	38 lb (17.2 kg)
1¼", 1-½"	7.25 (184)				6.6 (168)	7.1 (180)	13.6 (345)	40.5 lb (18.4 kg)	44 lb (20 kg)
2"	8.5 (216)		9.0 (228)	10.6 (269)	7.2 (183)	8.2 (208)	15.4 (391)	65 lb (29.5 kg)	71 lb (32.2 kg)
2-½"		10.9 (277)	11.5 (292)	13.6 (345)	7.9 (201)	13.9 (353)	21.8 (554)	153.5 lb (69.6 kg)	167 lb (75.8 kg)
3"		11.75 (298)	12.5 (318)			14.4 (367)	22.25 (565)	184 lb (83.7 kg)	201 lb (91.2 kg)
4"		13.9 (353)	14.5 (368)	15.6 (396)	9.1 (231)	16.1 (409)	25.25 (641)	280.5 lb (127 kg)	305 lb (138 kg)

Sample specification

The On/Off operation of the main valve shall be controlled by an electrical solenoid pilot which is bolted directly to the main valve and may be removed without disturbing the control tubing connections. The main valve shall be single seated with hardened stainless steel trim. The valve body shall be cast iron (cast steel).
The electric pilot shall have a NEMA 2, 3, 3S, 4, and 4X enclosure with 120 VAC / 60 Hz coil.

Installation

The valve should be installed in a horizontal pipe with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the valve. The trap and valve should both be protected with a strainer.

Maintenance

Complete installation and maintenance instructions are given in IM-P717-02-US, a copy of which is supplied with each valve. Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

Standard Transmission tubing for Cast Iron Valve will be Copper with Brass fittings.

Standard Transmission tubing for Cast Steel Valve will be Stainless Steel.

If a different material is required order the Spare Part Kit

Stainless Steel Transmission Tubing Kits

Item #	Size	Description
71464	½", ¾"	Kit, ½"-¾", 25 Valve, Stainless Steel, Transmission tubing
71465	1"	Kit, 1", 25 Valve, Stainless Steel, Transmission tubing
71466	1¼", 1½"	Kit, 1¼"-1½", 25 Valve, Stainless Steel, Transmission tubing
71467	2"	Kit, 2", 25 Valve, Stainless Steel, Transmission tubing
71468	2½"	Kit, 2½", 25 Valve, Stainless Steel, Transmission tubing
71469	3"	Kit, 3", 25 Valve, Stainless Steel, Transmission tubing
71470	4"	Kit, 4", 25 Valve, Stainless Steel, Transmission tubing

Copper Tubing Transmission Line Kits

Item #	Size	Description
57302	½", ¾"	Transmission tubing kit, ½"-¾", 25 Valve
57303	1"	Transmission tubing kit, 1", 25 Valve
57304	1¼", 1½"	Transmission tubing kit, 1¼"-1½", 25 Valve
57305	2"	Transmission tubing kit, 2", 25 Valve
58010	2½"	Transmission tubing kit, 2½", 25 Valve
58011	3"	Transmission tubing kit, 3", 25 Valve
58012	4"	Transmission tubing kit, 4", 25 Valve

TI-P237-01-US
Issue 1

Electric Pilot Operated On/Off Regulator 6" 25E

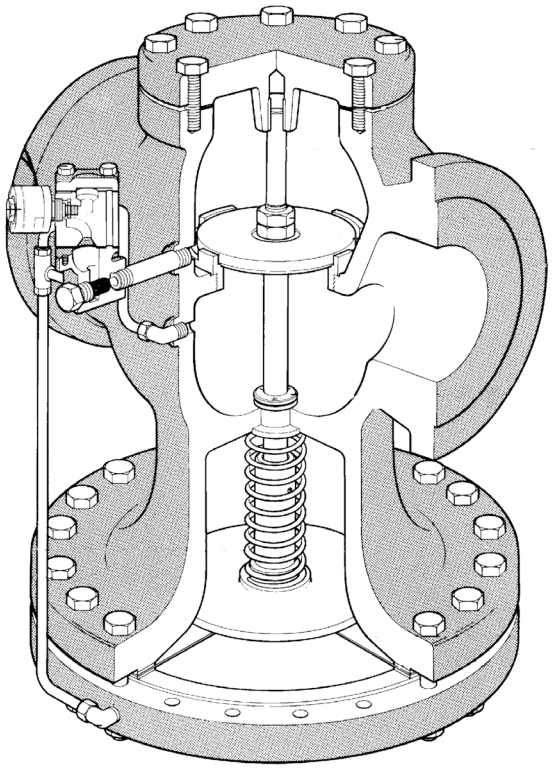
Description

The 25E is controlled by an electric pilot valve. The main valve opens wide when the pilot is energized; it closes when the pilot is de-energized. The 25E does not modulate or throttle steam at part load.
This valve meets Class IV shut-off specifications but is not suitable for dead-end service.

Model	**25E**	
Sizes	6" (DN150)	
Connections	ANSI 125, 250	ANSI 150, 300
Construction	Cast iron	Cast steel
Options	Reduced Orifice Designated by "S"	
Electric pilot specifications	Enclosure: NEMA 2, 3, 3S, 4, & 4X 120 VAC / 60 Hz Holding: 23 VAC Inrush: 45 VAC Normally Closed PMO: 200 psi g (13.8 bar g) TMO: 388 °F (198 °C)	
Electric pilot options	240 VAC / 60Hz 24 VAC / 60 Hz For faster response time PMO: 140 psi g (9.7 bar g) TMO: 361 °F (183 °C)	

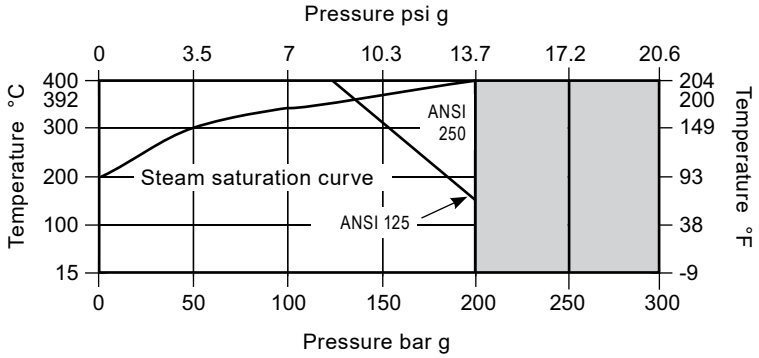
Typical applications

On/Off control of steam flow in response to remote manual or automatic electrical signals which may originate at safety switches, timers, manual switches, etc.

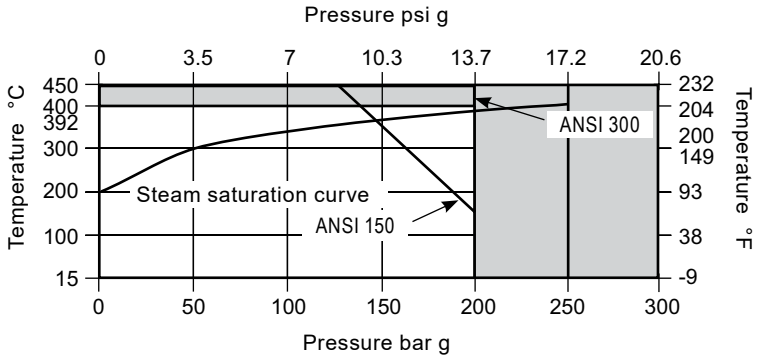


Limiting operating conditions

Cast iron



Cast steel



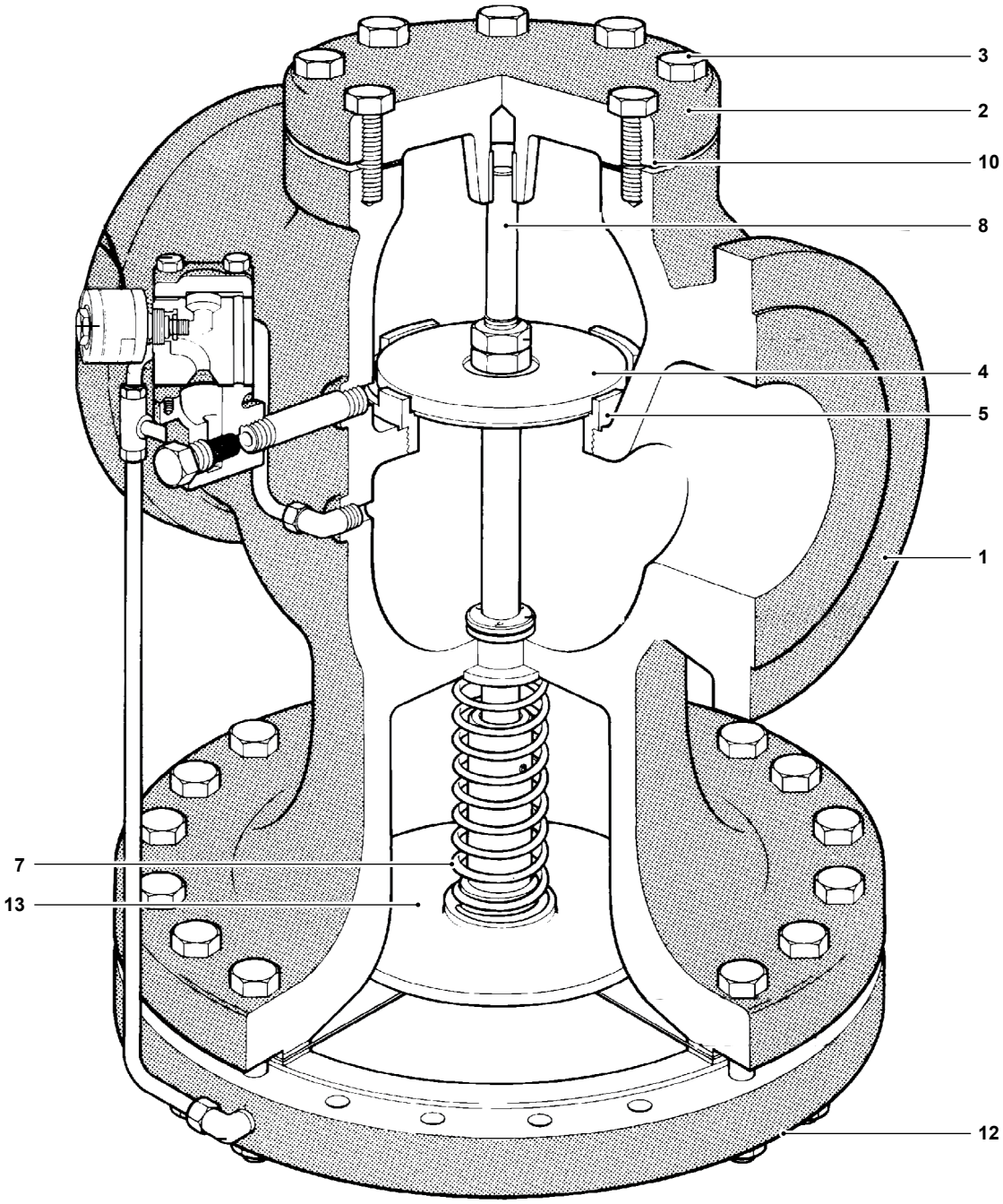
The product **should not** be used in this region.

*The temperature of the sensing bulb must not exceed 350 °F (177 °C)

Cv Values

Size	6"	6" "S"
Cv value	280	156

Materials

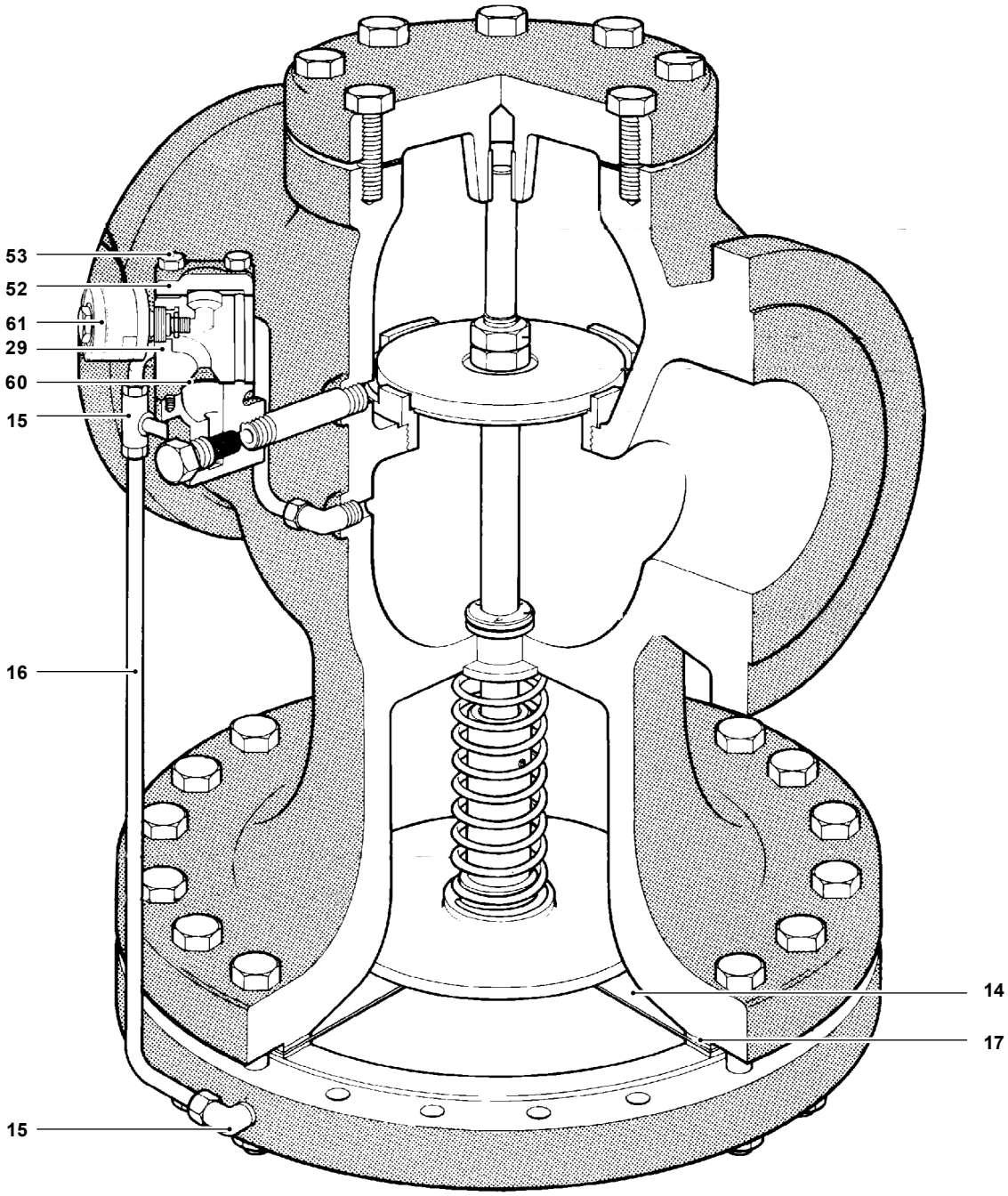


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
3	Cover Bolts	Steel	AISI 1038
4	Main Valve Head	Stainless steel	ASTM A 743 CA 40
5	Main Valve Seat	Stainless steel	ASTM A 743 CA 40

No.	Part	Material	
7	Valve Return Spring	Stainless steel	AISI 302
8	Valve Stem	Stainless steel	AISI 304
10	Cover Gasket	Graphite	BS 2815 A
12	Lower diaphragm case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
13	Diaphragm Plate	Stainless steel	ASTM A 743 CA 40

Materials continued on next page

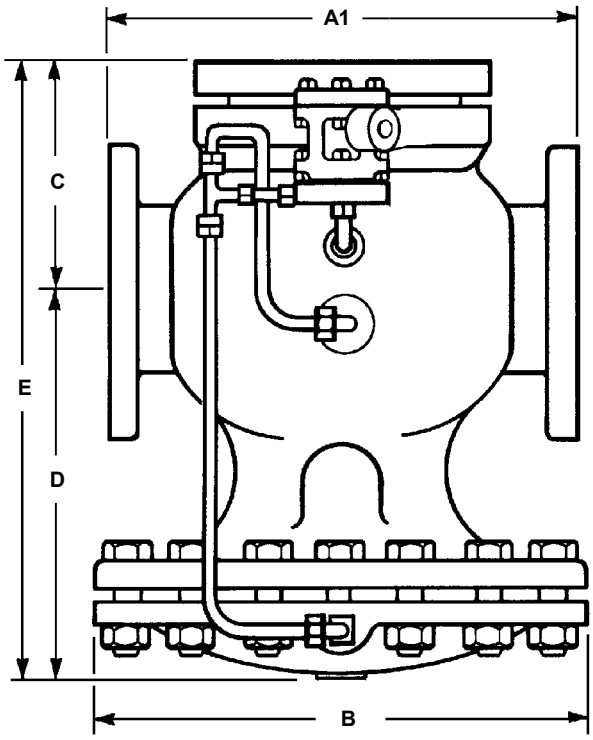
Materials (continued)



No.	Part	Material	
14	Main diaphragm (2 ply)	Stainless steel	ASTM A240
15	Orifice	Brass	ASTM B16
16	Tubing Assembly	Copper	ASTM B280 (122)
17	Diaphragm Gasket	Graphite	BS 2815 A

No.	Part	Material	
29	Electric Pilot Adaptor	Cast iron	ASTM A126 CL B
52	Electric Pilot Cover	Cast iron	ASTM A 126 CL B
53	Cap Screws	Steel	ASTM A449
60	Pilot Gasket	Graphite	
61	Electric Solenoid Valve		

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Size	ANSI 125/150 A1	ANSI 250/300 A1	B	C	D	E	Weight
6"	18.1 (460)	18.9 (480)	19.75 (502)	8.9 (226)	17.1 (434)	26.1 (663)	595 lb (270 kg)

Capacities

The valve is sized according to the temperature control requirements. For selection and sizing, see TI-P235-18-US.

Sample specification

The On/Off operation of the main valve shall be controlled by an electric solenoid pilot which may be removed without disturbing the control tubing connections. The main valve shall be single-seated, with hardened stainless steel trim; the valve body shall be Cast iron. The electric pilot shall have a NEMA 2, 3, 3S, 4, & 4X enclosure with 120 VAC / 60 Hz coil.

Installation

The valve should be installed in a horizontal pipe with suitable by-pass and isolating valves. A steam trap must be installed upstream to prevent condensate from reaching the valve. The trap and valve should both be protected with a strainer separator set.

Maintenance

Complete installation and maintenance instructions are given in
IM-P717-02-US and ADVP 3029, a copy of which is supplied with each valve. Available spare parts are shown on TI-P235-02-US and TI-P335-11-US.

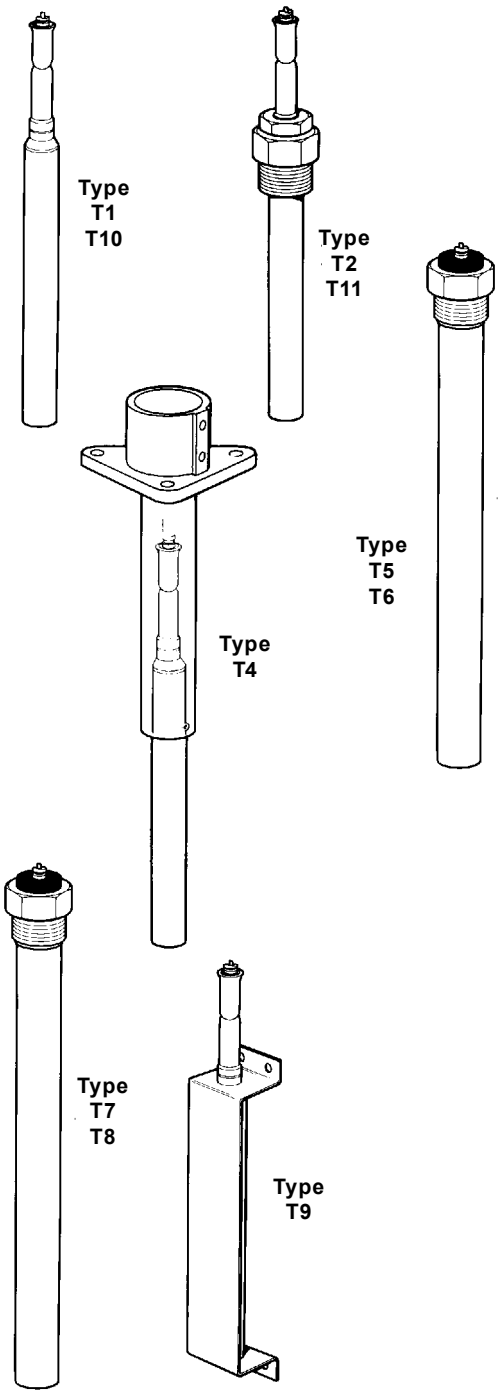
TI-P235-07-US
Issue 3

Pilot Operated Temperature Regulators
25 Series Thermostat Bulb Types

Description

The Thermostat Bulb styles are for temperature pilots used on the following:

- 25T and 25TE Temperature Controls
- 25PT and 25 PTE Pressure Temperature Controls.



Thermostat bulb types

T1	Bulb in copper with brass capillary tubing.
T2	Bulb in copper with union connection ¾" (DN20) NPT, with brass capillary tubing.
T4	T1 flanged temperature pilot well.
T5	Brass, 5¾" (146 mm) extension well for T2 thermostat bulb.
T6	Stainless steel, 5¾" (146 mm) extension well for T2 thermostat bulb.
T7	Brass, 18" (457 mm) extension well for T1 thermostat bulb.
T8	Stainless steel, 18" (457 mm) extension well for T1 thermostat bulb.
T9	Wall mounting bracket for T1 thermostat bulb.
T10	Bulb in stainless steel, with stainless steel capillary tubing.
T11	Bulb in stainless steel with union connection ¾" (DN20) NPT, with stainless steel capillary tubing.

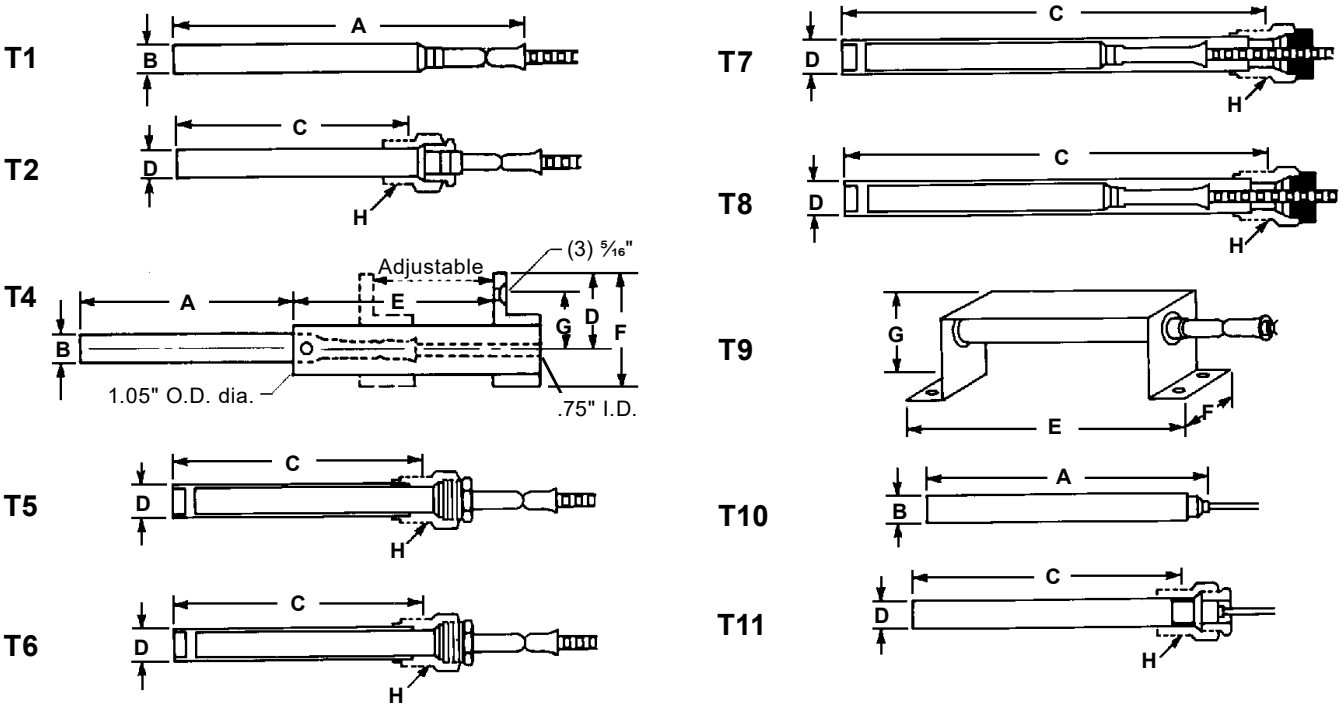
Limiting operating conditions

Up to 200 °F/93 °C above the control set point provided temperatures at the bulb do not exceed 350 °F/176 °C.

Options:

Capillary Tube Length
Standard 8 ft. (2.4 m) and 15 ft. (4.6 m) available.
Intervals of 5 ft. (1.5 m) up to a maximum of 50 ft (15.2 m).

Dimensions (approximate) in inches (mm)



Style	A	B	C	D	E	F	G	NPT H	J
T1	8 (203)	0.62 (15.7)							
T2			5.21 (132)	0.62 (15.7)				¾" (DN20)	
T4	5 (127)	0.62 15.7)		1.4 (36)	7.0 (178)	2.25 (57.2)	1.0 (25.5)		5⁄16" (DN8)
T5 T6			5.75 (146)	0.75 19)				¾" (DN20)	
T7 T8			18 (457)	0.75 (19)				¾" (DN20)	
T9					6.7 (170)	1.5 (38)	2.1 (53)		
T10	6.4 (162)	0.62 (15.7)							
T11			6.12 (155	0.62 (15.7)				¾" (DN20)	

Installation

The thermostatic bulb should be carefully located in the medium being heated. Make sure that the entire length of the thermostatic bulb is immersed in the heated medium with a good circulation left over it.
Locate the thermometer being used to monitor temperature close to the thermostatic bulb. When the bulb is contained in a well, use a heat conducting compound to improve response time.

How to specify

1 – ½" Spirax Sarco 25T Temperature Control with Thermostat Bulb Style T2.

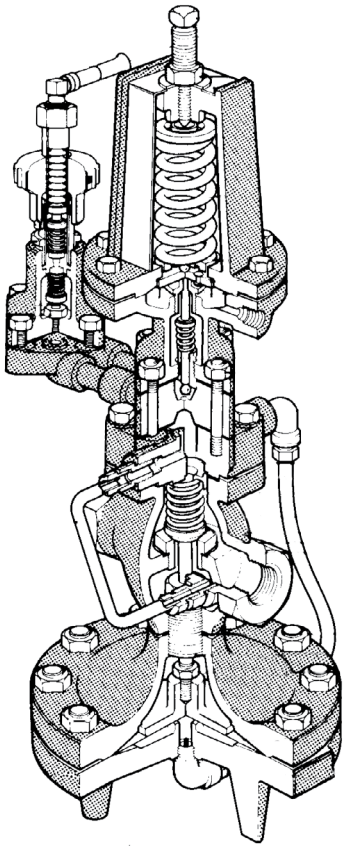
TI-P235-14-US
Issue 2

Combination Pressure/Temperature Regulator ½" to 4" 25PT

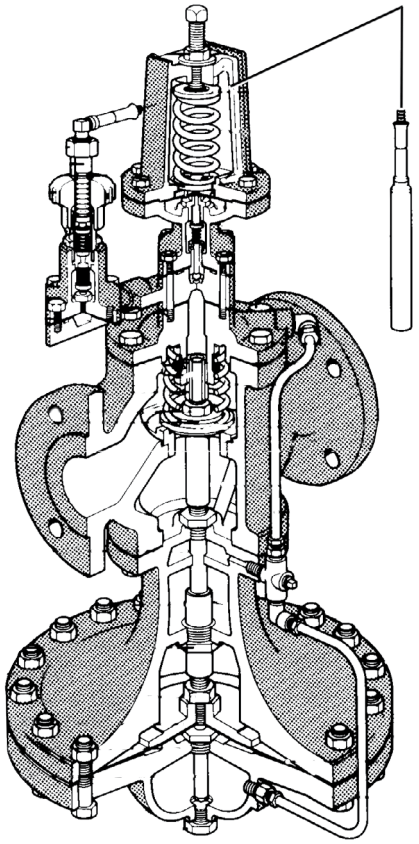
Description

The 25PT eliminates the need for a separate pressure regulator and a temperature regulator. Normal operation is controlled by the temperature pilot, and the pressure pilot sets an upper limit on the downstream steam pressure. The temperature pilot has a calibrated dial for accurate temperature setting, and is available with a variety of solid-fill sensing bulbs (See TI-P235-07-US). The standard capillary tubing length is 8 feet (2.4 meters), with an optional standard length of 15 feet (4.6 meters).

Model	**25PT**			
Sizes	½" to 2" (DN15 to DN50)	2½", 3", 4" (DN65, DN80, DN100)	½" to 2" (DN15 to DN50)	2", 2½", 3" 4" (DN50, DN65, DN80, DN100)
Connections	NPT	ANSI 125	NPT	ANSI 300
Construction	Cast iron		Cast steel	
Options		ANSI 250		ANSI 150 (excludes 2")
	Non-Standard capillary tubing length (see TI-P235-07-US)			
Transmission Tubing	Copper Tubing		Stainless Steel Tubing	



½" to 2"



2"* to 4"
***ANSI 300 ONLY**

Typical applications

Storage steam water heaters, instantaneous heat exchangers and converters, air handling coils, tank heating coils, steam jacketed vessels, steam chests, molds and platens, and other temperature control applications where it is necessary or desirable to set an upper limit on the delivered steam pressure.

Capacities

The regulator is sized according to the temperature control requirements. For selection and sizing, see TI-P235-18-US.

Limiting operating conditions

PMO	Maximum operating pressure	NPT:	250 psi g (17 bar g) @ 450 °F (232 °C)
		ANSI 125:	125 psi g (8 bar g) @ 450 °F (232 °C)
		ANSI 250:	250 psi g (17 bar g) @ 450 °F (232 °C)
		ANSI 150:	185 psi g (12 bar g) @ 450 °F (232 °C)
		ANSI 300:	300 psi g (20 bar g) @ 450 °F (232 °C)
Maximum Operating Temperature			450 °F (232 °C)

*The temperature of the sensing bulb must not exceed 350 °F (177 °C)

Standard temperature ranges

30 °F to 90 °F	(0 °C to 32 °C)
60 °F to 120 °F	(16 °C to 49 °C)
100 °F to 160 °F	(38 °C to 71 °C)
120 °F to 180 °F	(49 °C to 82 °C)
160 °F to 220 °F	(71 °C to 104 °C)
200 °F to 260 °F	(93 °C to 127 °C)
260 °F to 320 °F	(127 °C to 160 °C)

Downstream pressure ranges

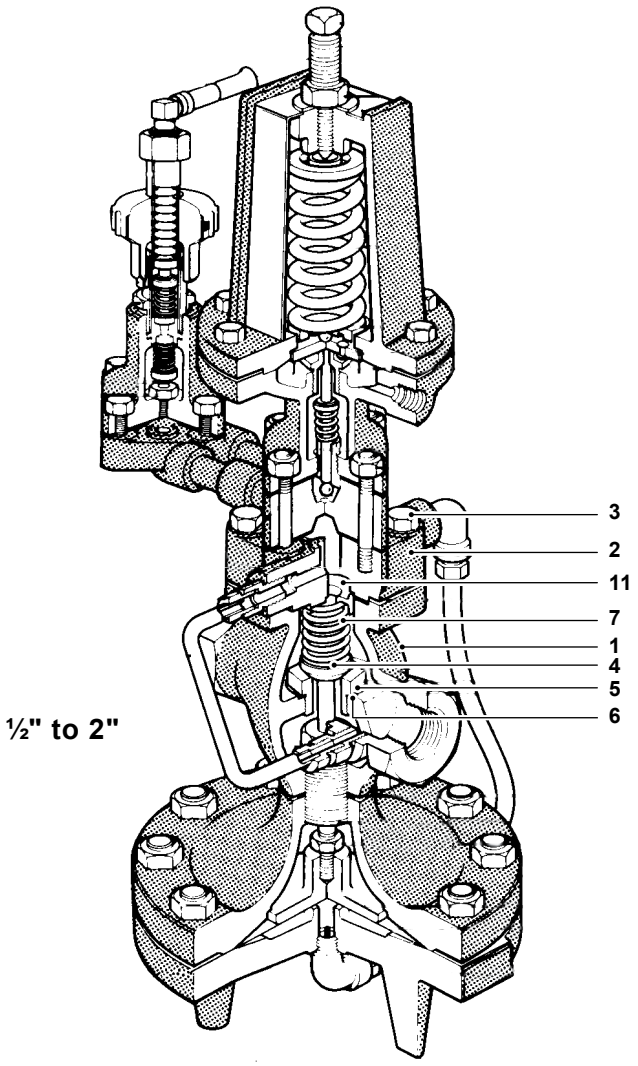
For the following downstream pressures, three color-coded pilot valve springs are available:

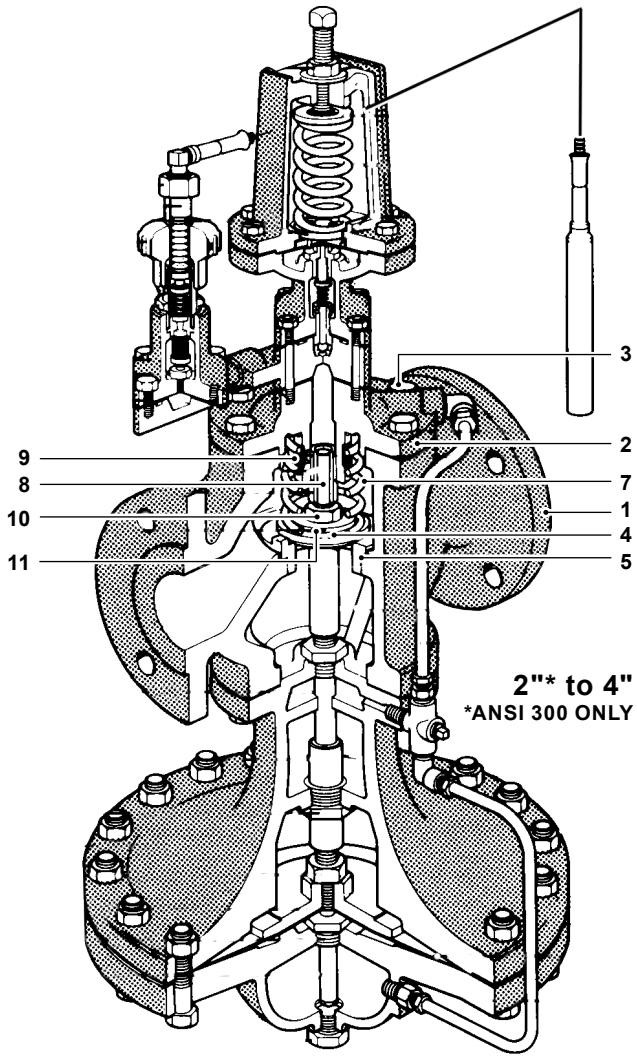
Yellow	Blue	Red
3 to 30 psi	20 to 100 psi	80 to 290 psi

Pressure shell design conditions

PMA	Maximum allowable pressure	Cast iron	250 psi g @ 0-450 °F	(17 bar g @ 0-232 °C)
		Cast steel	300 psi g @ 0-600 °F	(21 bar g @ 0-316 °C)
TMA	Maximum allowable temperature	Cast iron	450 °F @ 0-250 psi g	(232 °C @ 0-17 bar g)
		Cast steel	600 °F @ 0-300 psi	(316 °C @ 0-21 bar g)

Materials

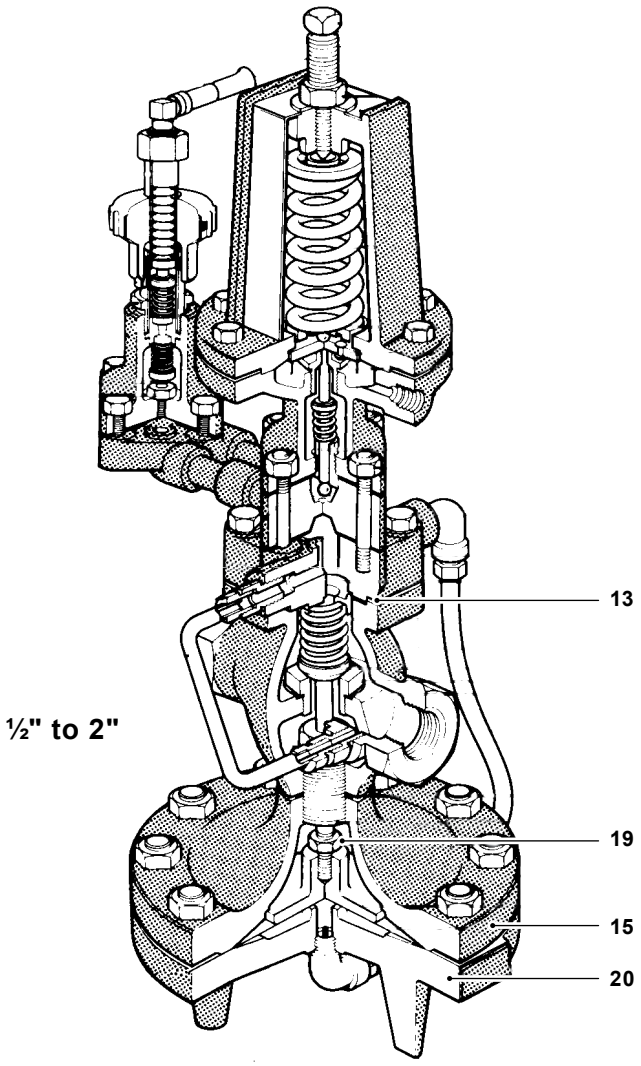


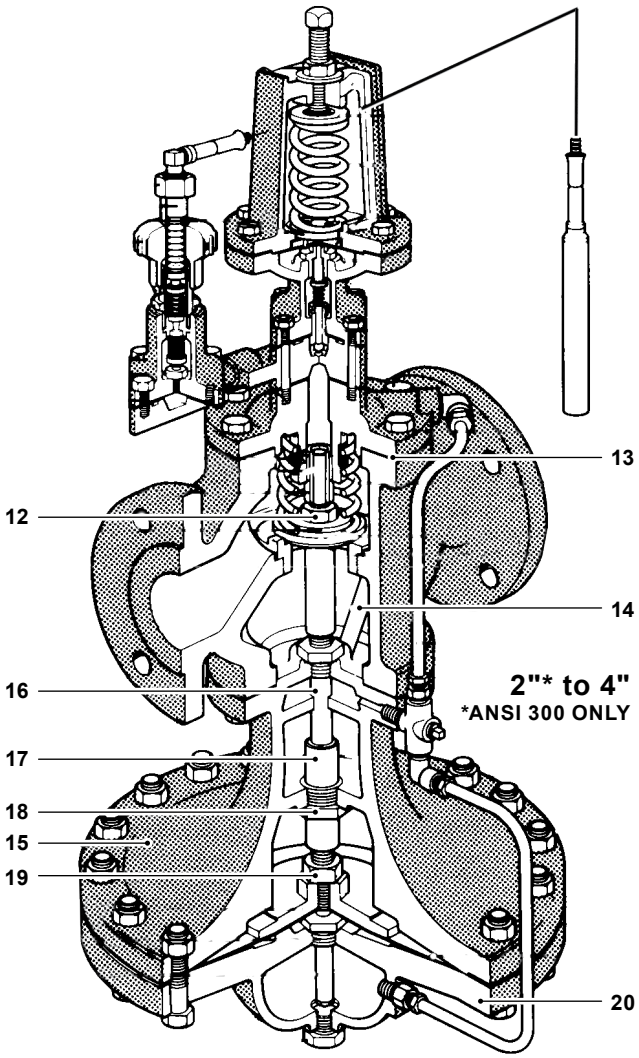


No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB
3	Cover Bolts	Steel	ASTM A449
4	Main Valve Head	Stainless steel	
5	Main Valve Seat	Stainless steel	
6	Main Valve Seat Gasket	Copper	
7	Valve Return Spring	Stainless steel	
8	Valve Stem	Stainless steel	
9	Strainer Screen	Stainless steel	
10	Valve Stem Sleeve	Stainless steel	
11	Spring Guide	Cast iron ½"-2" (DN15 - DN50)	
		CRS 2"* - 4" (DN50 - DN100)	

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Materials (continued)

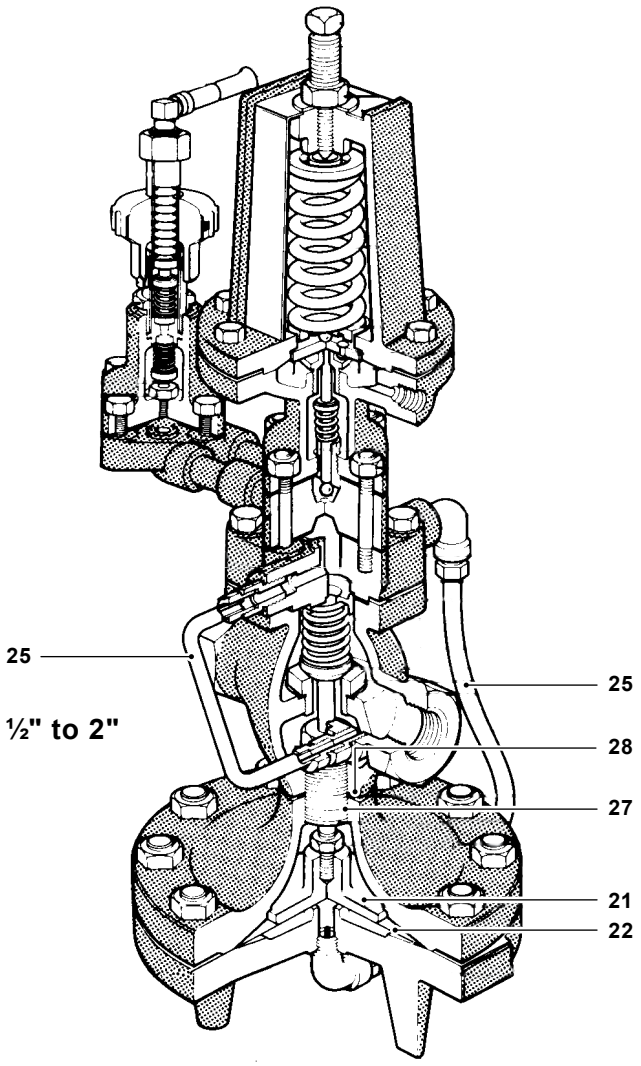


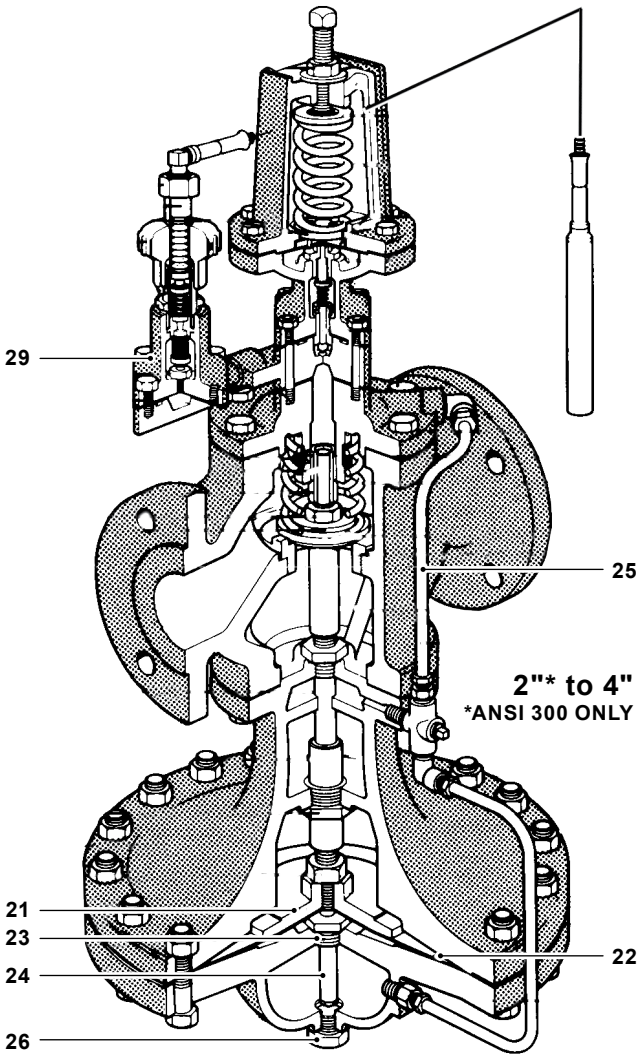


No.	Part	Material	
12	Nut	Steel	
13	Cover Gasket	Graphite	
14	Pressure Equalizer Pipe	Stainless steel	
15	Upper Diaphragm Case	Cast iron	
		Cast steel	
16	Stem Bushing (2½" - 4" Cast steel only)	Stainless steel	AISI 303
17	Diaphragm Plate Stem	Stainless steel	
18	Diaphragm Stem Guide	Stainless steel	
19	Nut	Brass ½" - 2" (DN15 - DN50)	
		Steel 2"* - 4" (DN50 - DN100)	
20	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A216 Gr WCB

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Materials (continued)

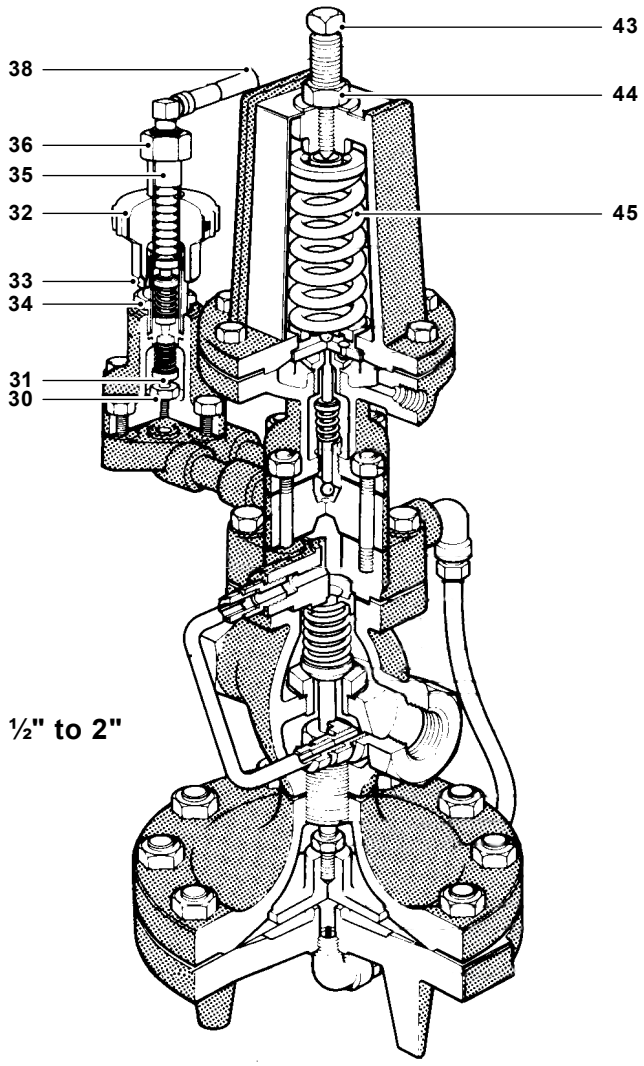




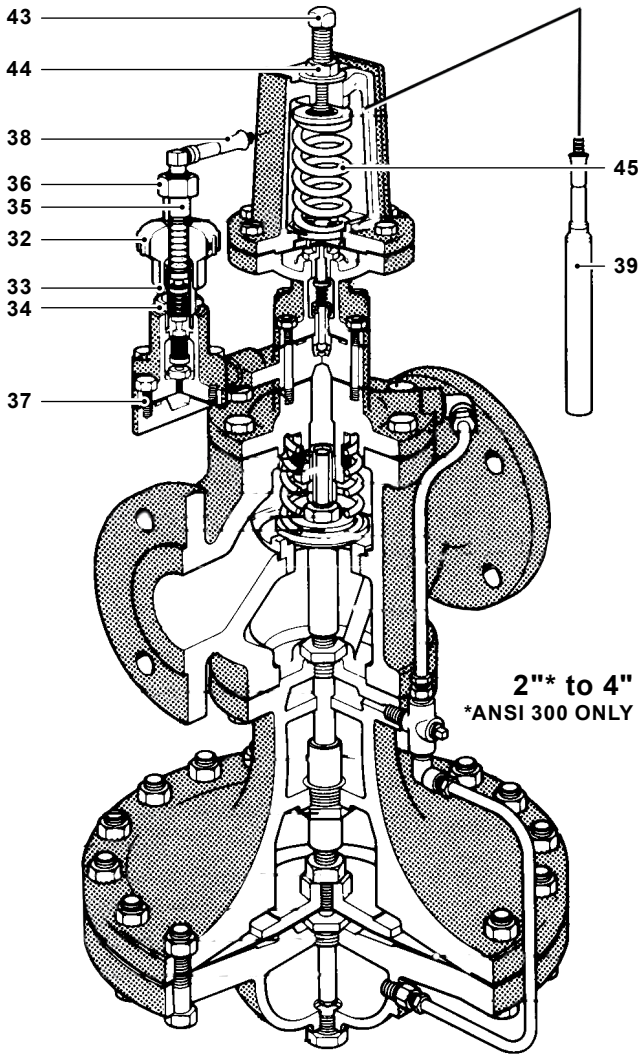
No.	Part		Material	
21	Diaphragm Plate		Brass ½" - 2" (DN15 - DN50)	
			C.I. 2"* - 4" (DN50 - DN100)	
22	Main Diaphragm (2 ply)		Stainless steel	
23	Bushing		CRS	
24	Tube & Orifice		Stainless steel	
25	Tubing Assembly Cast Iron		Copper / Brass	
	Tubing Assembly Cast Steel		Stainless Steel	
26	Plug	(Cast iron)	Brass	
		(Cast steel)	Steel	
27	Connector Stud		Stainless steel	
28	Body Gasket		½" - 2" Copper Clad (DN15 - DN50)	
			2"* - 4" Graphite (DN50 - DN100)	
29	Pilot Valve Body		Cast iron	ASTM A 126 CL B
			Cast steel	ASTM A216 Gr WCB

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Materials (continued)



½" to 2"

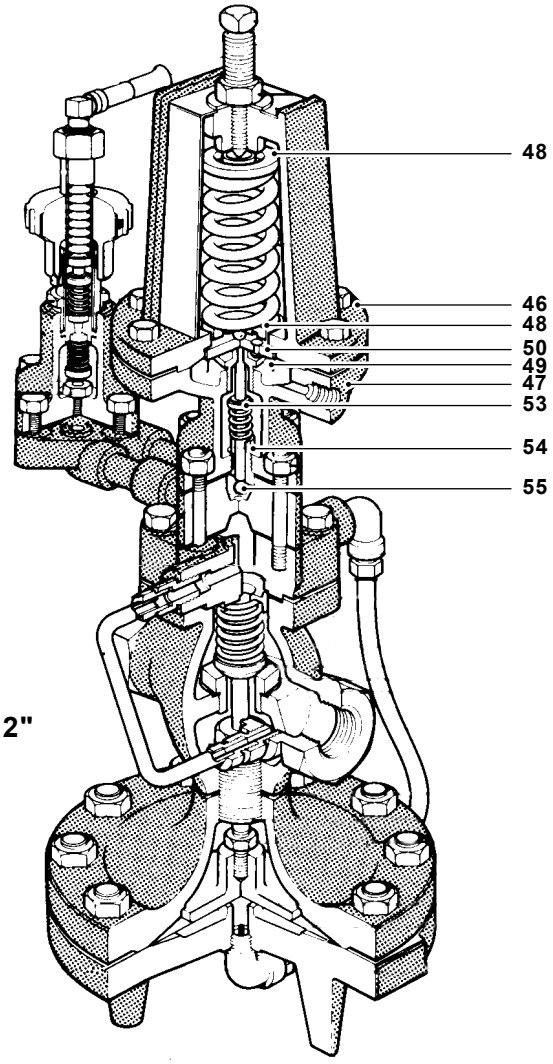


2"* to 4"
*ANSI 300 ONLY

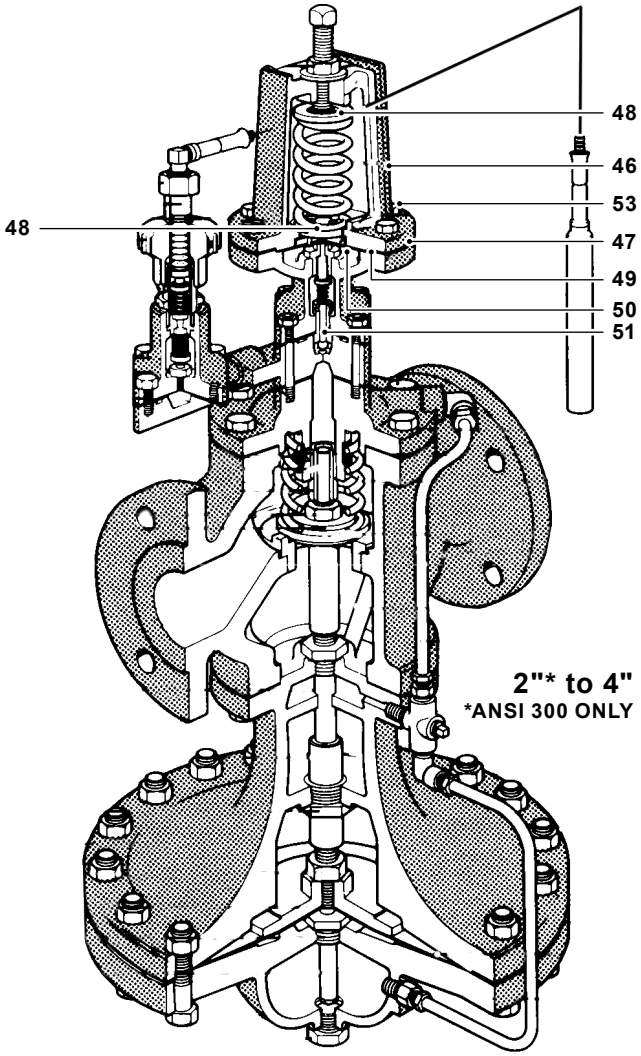
No.	Part	Material
30	Pilot Valve Seat	Stainless steel
31	Pilot Valve Head	Stainless steel
32	Adjustment Knob	Phenolic
33	Pointer	Stainless steel
34	Extension Nut	Brass
35	Case Tube	Brass
36	Retaining Nut	Brass
37	Pilot Mounting Screws	Steel
38	Capillary Tube	Varies with style selected
39	Bulb	Varies with style selected
43	Adjustment Screw	Stainless steel
44	Jam Nut	Brass
45	Pilot Valve Spring	Steel

Materials continued on next page

Materials (continued)



½" to 2"

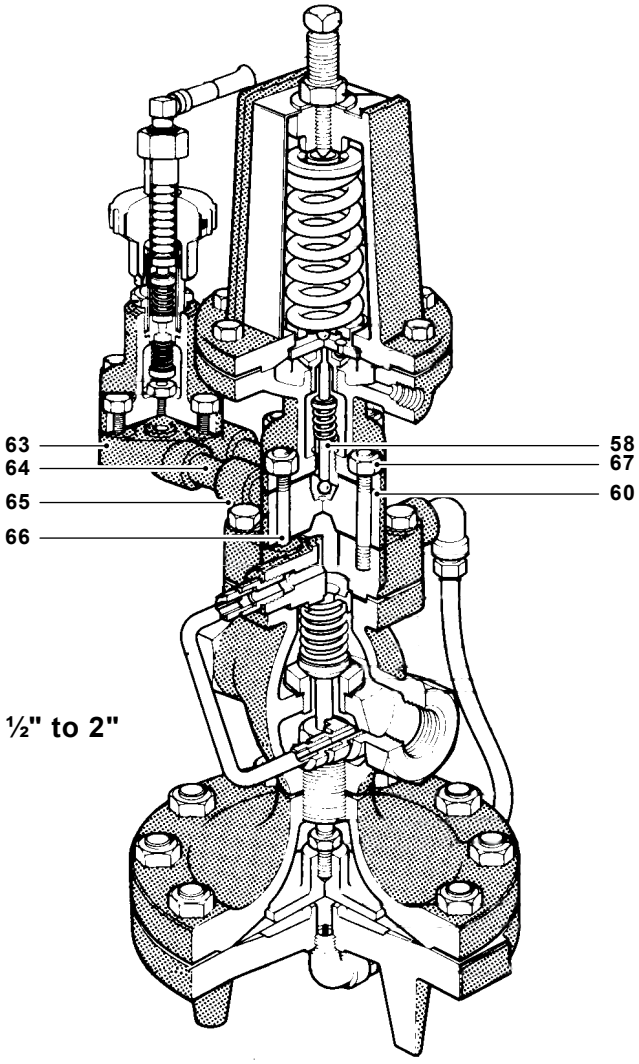


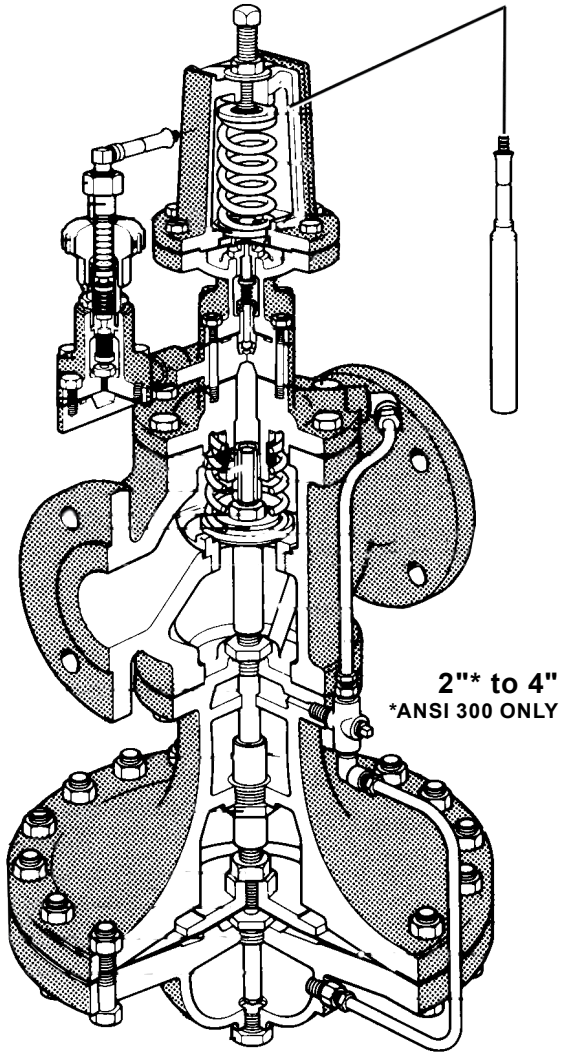
2"* to 4"
*ANSI 300 ONLY

No.	Part	Material	
46	Upper Diaphragm Case	Cast iron	
		Cast steel	
47	Lower Diaphragm Case	Cast iron	
		Cast steel	
48	Spring Plate	Steel	ASTM A569
49	Diaphragm	Stainless steel	
50	Diaphragm Plate	Brass	
51	Pilot Head Spring	Stainless steel	
52	Spring Retainer Cup	Stainless steel	
53	Retaining Ring	Brass	
54	Pilot Seat	Stainless steel	
55	Pilot Head	Stainless steel	
56	Head Stem	Stainless steel	

Materials continued on next page

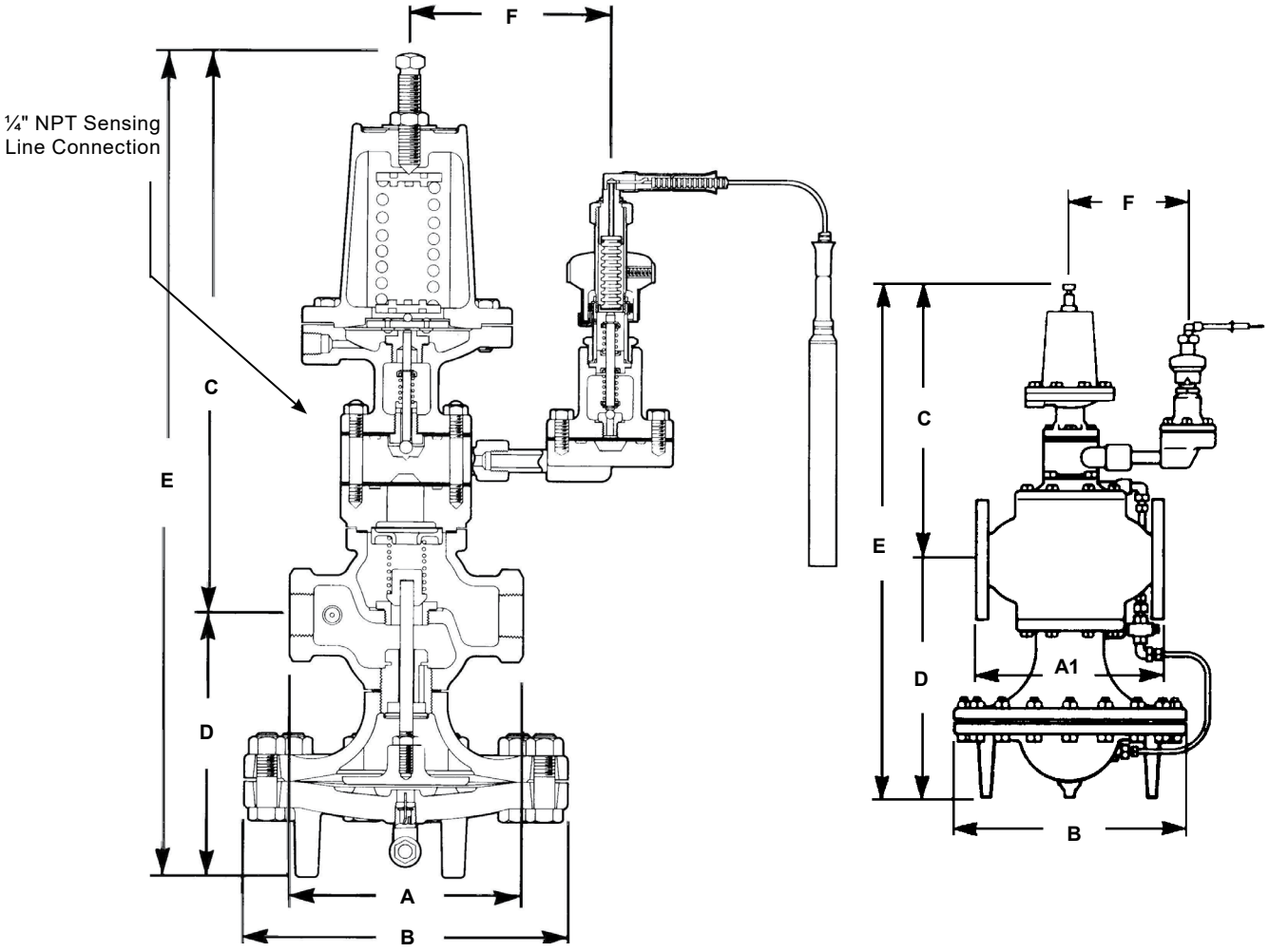
Materials (continued)





No.	Part	Material	
57	Stem Guide	Stainless steel	
58	Stem Guide Gasket	Stainless steel	
59	Seat Gasket	Stainless steel	
60	Pilot Gasket	Graphite	
61	Pilot Mounting Screws	Steel	ASTM A449
62	Diaphragm Case Screws	Steel	
63	"T" Pilot Adapter	Brass	
64	Adapter Pipe	Steel	
65	"P" Pilot Adapter	Ductile Iron	
		Cast steel	
66	Adapter Stud	Steel	
67	Adapter Nut	Steel	

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



½" to 2"

2"* to 4"

Size	A	ANSI 125 A1	ANSI 250 ANSI 300 A1	B	C	D	E	F	Weight	
									Cast iron	Cast steel
½", ¾"	5.5 (140)			7.6 (193)	13.25 (337)	6.2 (157)	19.4 (493)	5.0 (127)	38 lb (17.2 kg)	41 lb (18.6 kg)
1"	6.0 (152)			8.6 (218)	13.2 (335)	6.75 (171)	19.9 (505)	5.0 (127)	45 lb (20.4 kg)	49 lb (22.2 kg)
1¼", 1½"	7.25 (184)			8.6 (218)	13.75 (349)	7.1 (180)	20.8 (528)	5.0 (127)	50.5 lb (22.9 kg)	55 lb (25.0 kg)
2"	8.5 (216)		9.0 (229)	10.6 (269)	14.4 (366)	8.2 (208)	22.6 (574)	5.0 (127)	75 lb (34 kg)	82 lb (37.2 kg)
2½"		10.9 (277)	11.5 (292)	13.6 (345)	15.1 (384)	13.9 (353)	29.0 (737)	5.0 (127)	163.5 lb (74.2 kg)	178 lb (80.7 kg)
3"		11.75 (298)	12.5 (318)	13.6 (345)	15.0 (381)	14.4 (366)	29.4 (747)	5.0 (127)	194.5 lb (88.2 kg)	212 lb (96.2 kg)
4"		13.9 (353)	14.5 (368)	15.6 (396)	16.3 (414)	16.1 (409)	32.4 (823)	5.0 (127)	290.5 lb (132 kg)	316 lb (143 kg)

Sample specification

Pressure/Temperature Regulators shall be of the pilot-actuated, diaphragm-operated type with separate pressure and temperature pilots. The main valve shall be single-seated, with hardened stainless steel trim; the regulator shall be cast iron (cast steel). The pilots shall be removable without disturbing the control connections. The temperature setting shall be adjustable without the use of tools, and the set point shall be indicated on a calibrated dial. The thermostatic system shall be solid fill, and shall incorporate overheat protection. The regulator shall be capable of dead-end shut-off.

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer. The thermostatic bulb must be carefully located in the medium being heated. The pressure sensing line may be located either in the downstream piping or in the steam space. Complete installation instructions are given in IM-3-000-US.

Maintenance

Complete installation and maintenance instructions are given in IM-3-000-US, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P717-09-US and TI-P235-02-US.

Standard Transmission tubing for Cast Iron Valve will be Copper with Brass fittings.

Standard Transmission tubing for Cast Steel Valve will be Stainless Steel.

If a different material is required order the Spare Part Kit

Stainless Steel Transmission Tubing Kits

Item #	Size	Description
71464	½", ¾"	Kit, ½"-¾", 25 Valve, Stainless Steel, Transmission tubing
71465	1"	Kit, 1", 25 Valve, Stainless Steel, Transmission tubing
71466	1¼", 1½"	Kit, 1¼"-1½", 25 Valve, Stainless Steel, Transmission tubing
71467	2"	Kit, 2", 25 Valve, Stainless Steel, Transmission tubing
71468	2½"	Kit, 2½", 25 Valve, Stainless Steel, Transmission tubing
71469	3"	Kit, 3", 25 Valve, Stainless Steel, Transmission tubing
71470	4"	Kit, 4", 25 Valve, Stainless Steel, Transmission tubing

Copper Tubing Transmission Line Kits

Item #	Size	Description
57302	½", ¾"	Transmission tubing kit, ½"-¾", 25 Valve
57303	1"	Transmission tubing kit, 1", 25 Valve
57304	1¼", 1½"	Transmission tubing kit, 1¼"-1½", 25 Valve
57305	2"	Transmission tubing kit, 2", 25 Valve
58010	2½"	Transmission tubing kit, 2½", 25 Valve
58011	3"	Transmission tubing kit, 3", 25 Valve
58012	4"	Transmission tubing kit, 4", 25 Valve

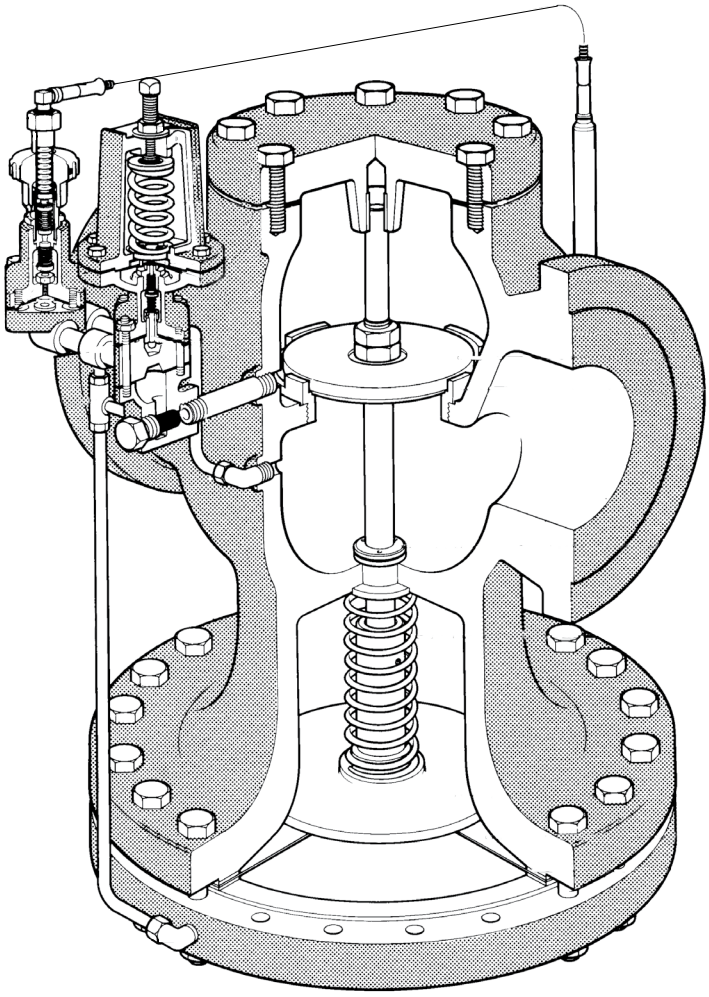
TI-P235-15-US
Issue 1

Combination Pressure/Temperature Regulator 6" 25PT

Description

The 25PT eliminates the need for a separate pressure regulator and a temperature regulator. Normal operation is controlled by the temperature pilot, and the pressure pilot sets an upper limit on the downstream steam pressure. The temperature pilot has a calibrated dial for accurate temperature setting, and is available with a variety of solid-fill sensing bulbs (See TI-P235-07-US). Standard capillary tubing lengths are 8ft (2.4 m) and 15ft (4.6 m). This valve meets Class IV shut-off specifications but is not suitable for dead-end service.

Model	**25PT**	
Sizes	6" (DN150)	
Connections	ANSI 125, 250	ANSI 150, 300
Construction	Cast iron	Cast steel
Options	Reduced Orifice Designated by "S" Non-standard capillary tubing length in 5 ft (1.5 m). intervals to a maximum of 50 ft (15.2 m). (See TI-P235-07-US)	

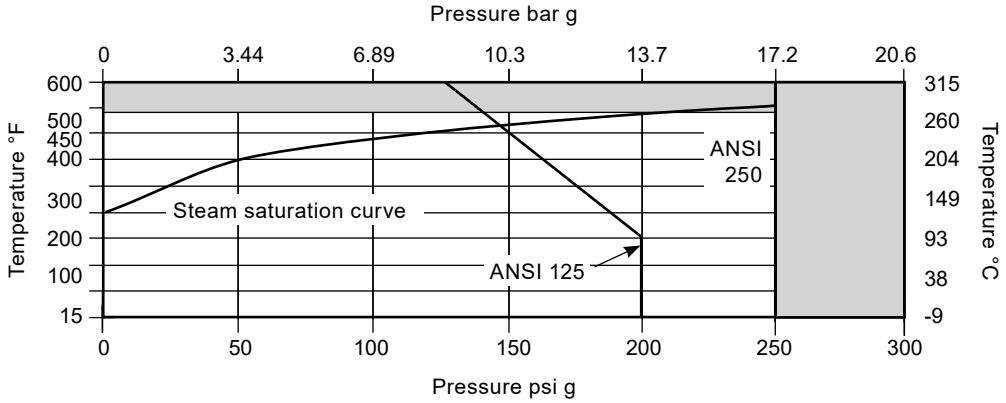


Typical applications

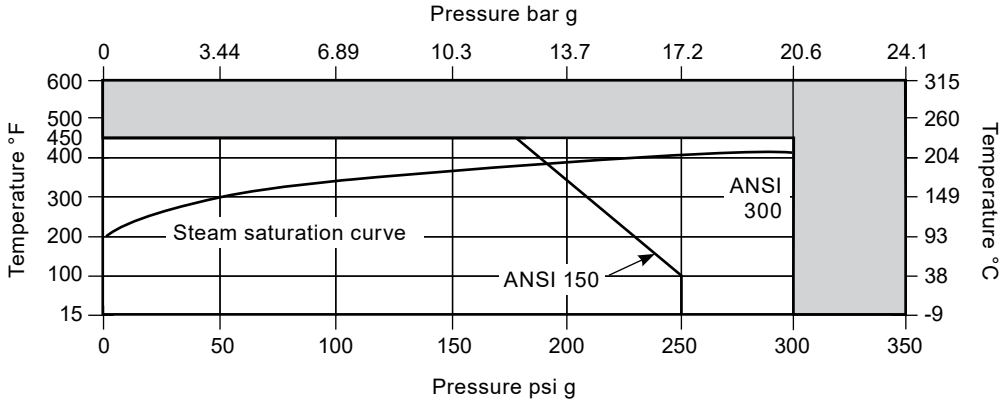
Storage steam water heaters, instantaneous heat exchangers and converters, air handling coils, tank heating coils, steam jacketed vessels, steam chests, molds and platens, and other temperature control applications where it is necessary or desirable to set an upper limit on the delivered steam pressure.

Pressure/temperature limits

Cast iron



Cast steel



The product **must not** be used in this region.

*The temperature of the sensing bulb must not exceed 350 °F (177 °C)

Downstream pressure ranges

For the following downstream pressures, 3 color-coded pilot valve springs are available:

Yellow	Blue	Red
3 to 30 psi	20 to 100 psi	80 to 250 psi

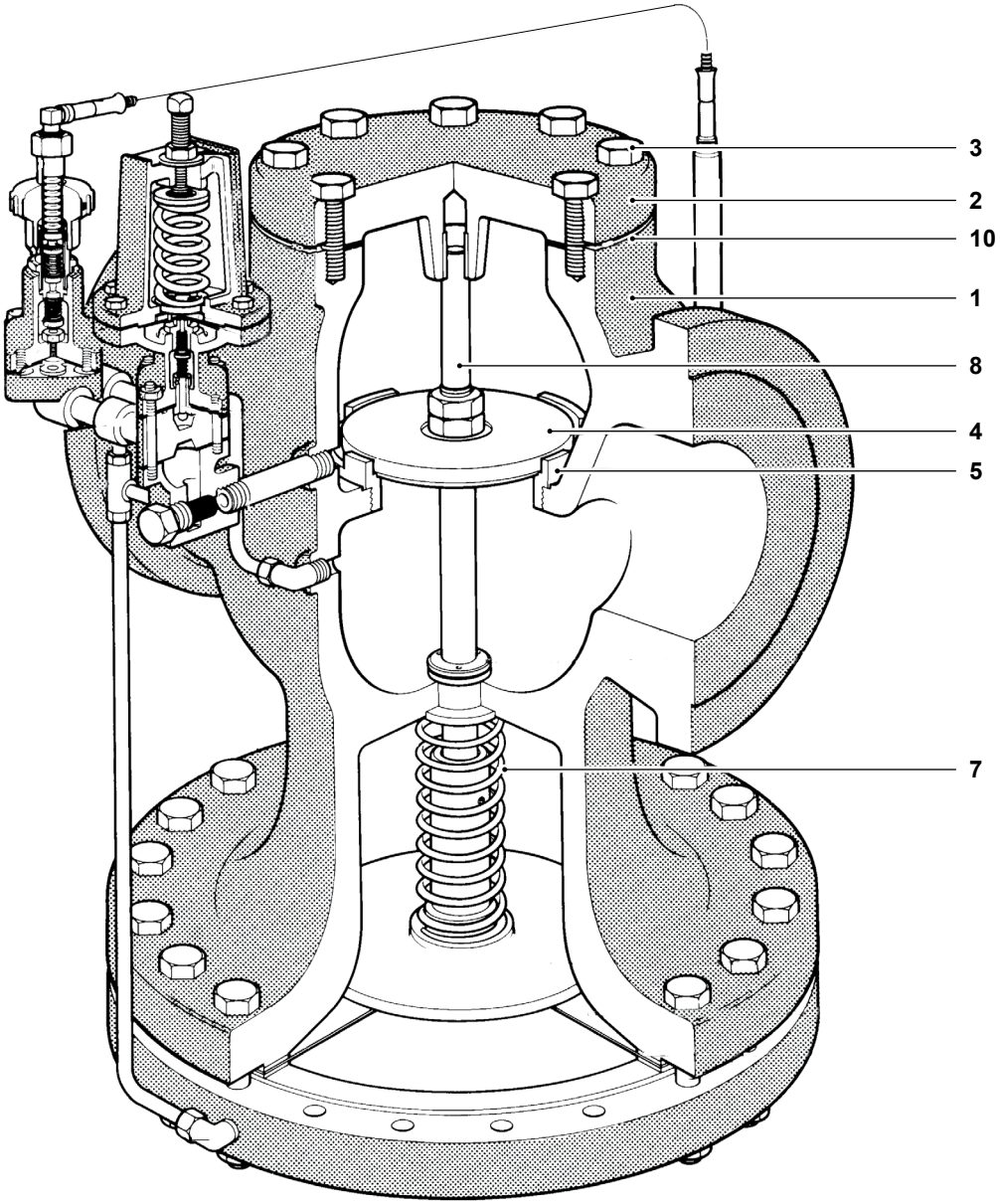
Cv Values

Size	6"	6" "S"
Cv value	280	156

Standard temperature ranges

30 °F to 90 °F	*0 °C to 32 °C*
60 °F to 120 °F	*15 °C to 50 °C*
100 °F to 160 °F	*40 °C to 70 °C*
120 °F to 180 °F	*50 °C to 80 °C*
160 °F to 220 °F	*70 °C to 105 °C*
200 °F to 260 °F	*95 °C to 125 °C*
260 °F to 320 °F	*125 °C to 160 °C*

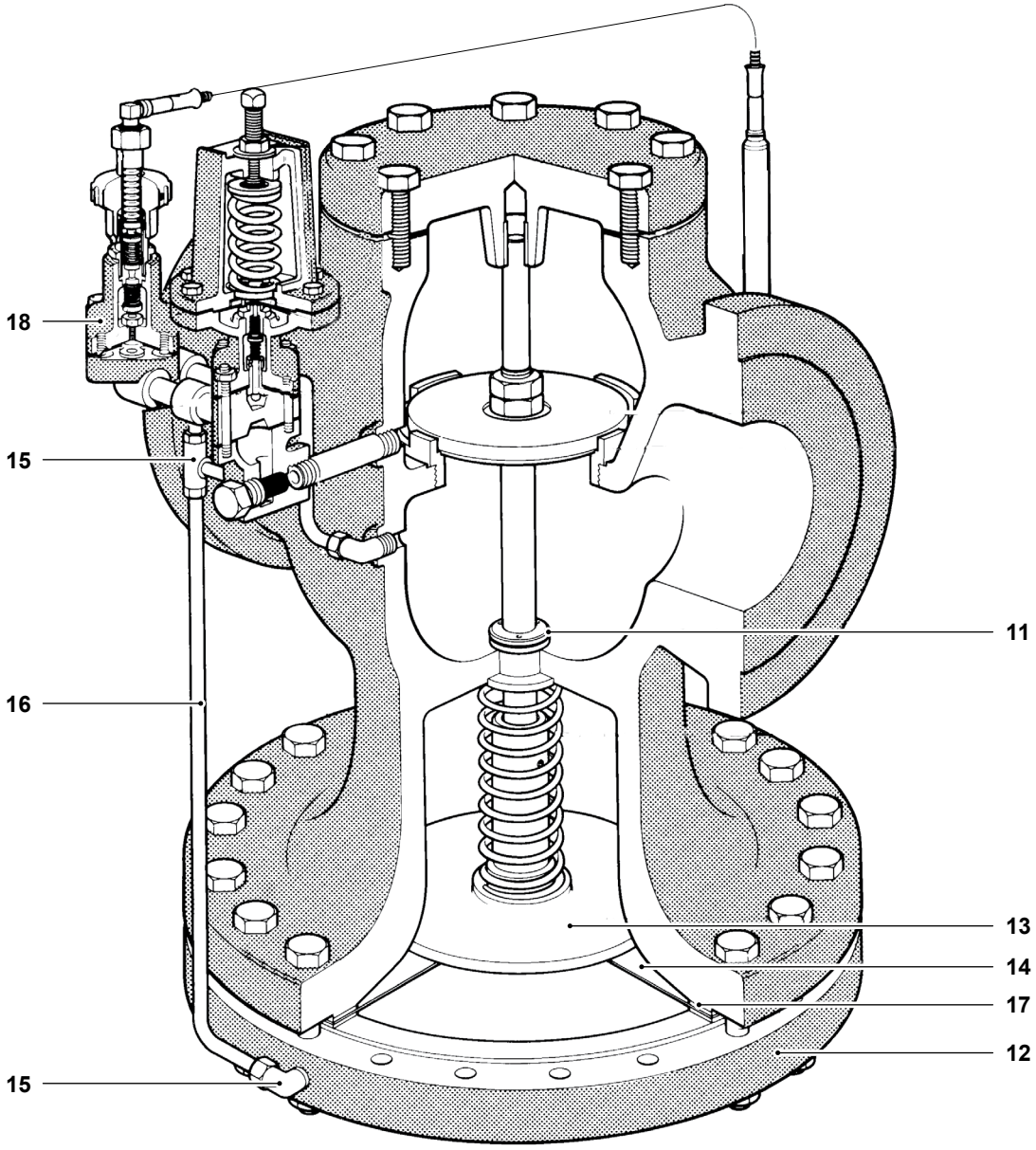
Materials



No.	Part	Material	
1	Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
2	Cover	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
3	Cover Bolts	Steel	AISI 1038
4	Main Valve Head	Stainless steel	ASTM A 743 CA 40
5	Main Valve Seat	Stainless steel	ASTM A 743 CA 40
7	Valve Return Spring	Stainless steel	AISI 302
8	Valve Stem	Stainless steel	AISI 304
10	Cover Gasket	Graphite	BS 2815A

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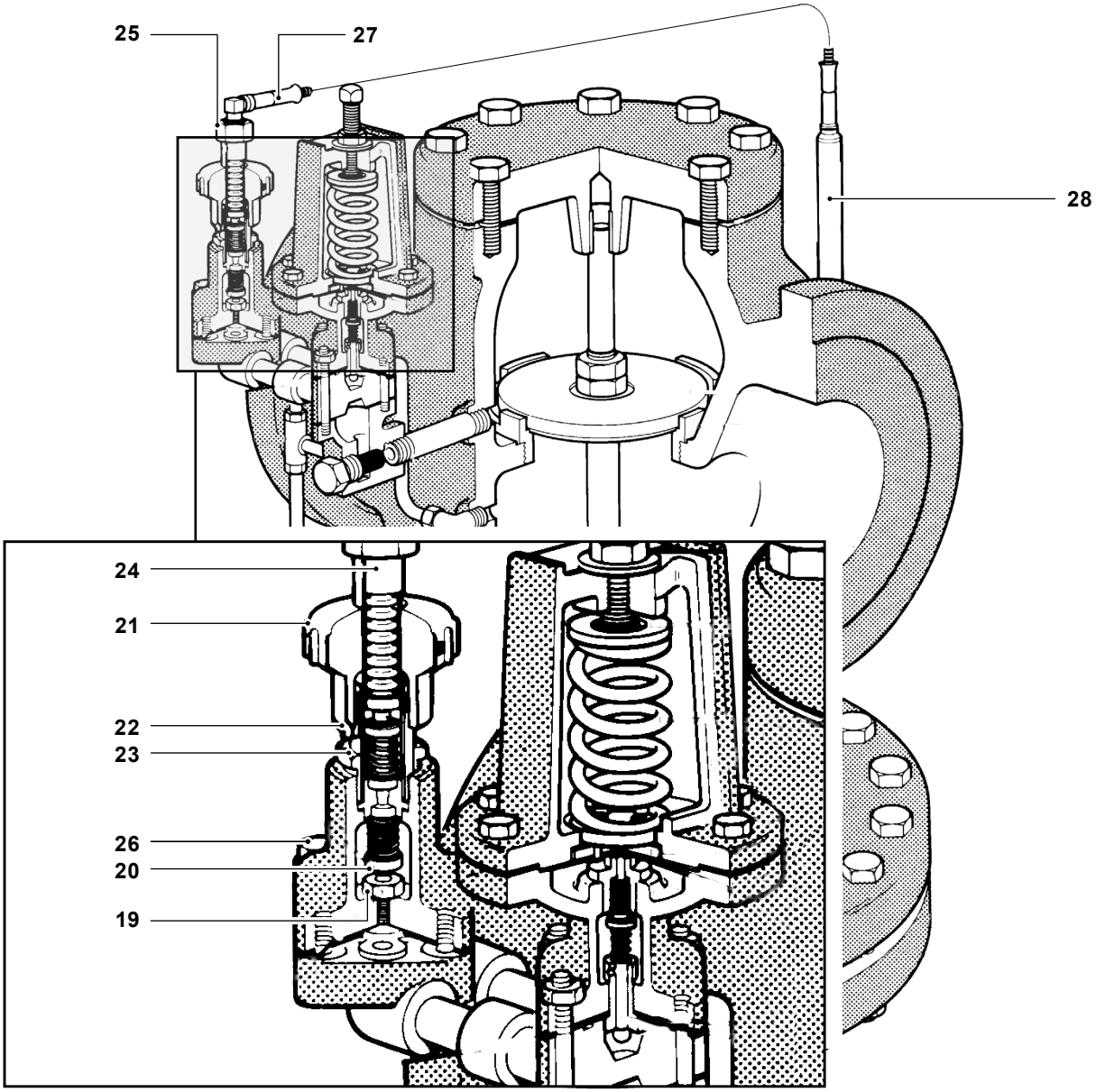
Materials (continued)



No.	Part	Material	
11	Stem Bushing	Brass	ASTM B16
12	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
13	Diaphragm Plate	Stainless steel	ASTM A 743 CA 40
14	Main Diaphragm (2 ply)	Stainless steel	ASTM A240
15	Tube & Orifice	Brass	ASTM B16
16	Tubing Assembly	Copper	ASTM B280 (122)
17	Diaphragm Gasket (2)	Graphite	BS 2815 A
18	Pilot Valve Body	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B

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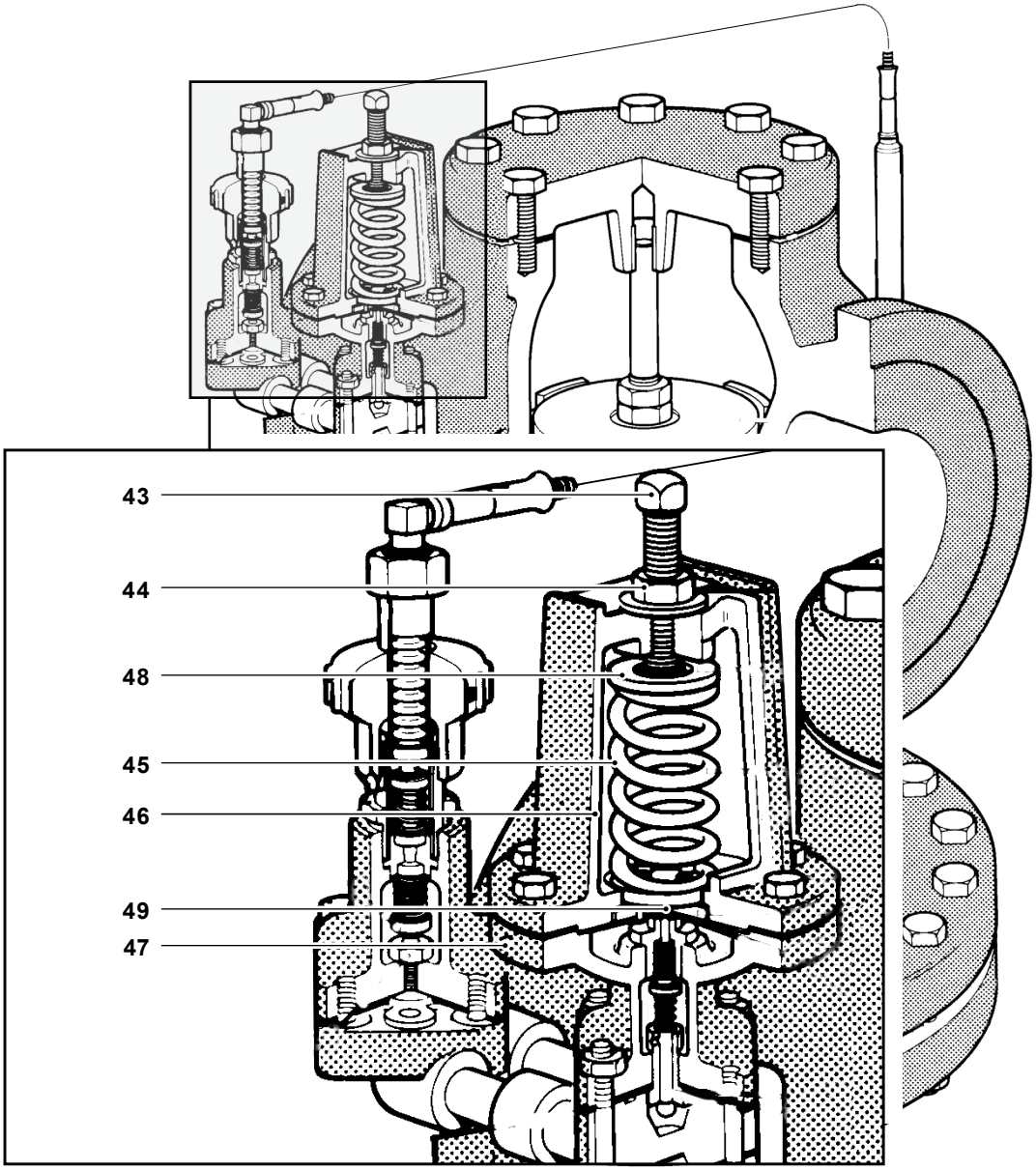
Materials (continued)



No.	Part	Material	
19	Pilot Valve Seat	Stainless steel	AISI 303
20	Pilot Valve Head	Stainless steel	AISI 440A
21	Adjustment Knob	Phenolic	ASTM D 700 Ty2
22	Pointer	Stainless steel	AISI 301
23	Extension Nut	Brass	ASTM B16
24	Case Tube	Brass	ASTM B 135 (330)
25	Retaining Nut	Brass	ASTM B 16
26	Pilot Mounting Screws	Steel	ASTM A449
27	Capillary Tube	Varies with style selected	
28	Bulb	Varies with style selected	

Materials continued on next page

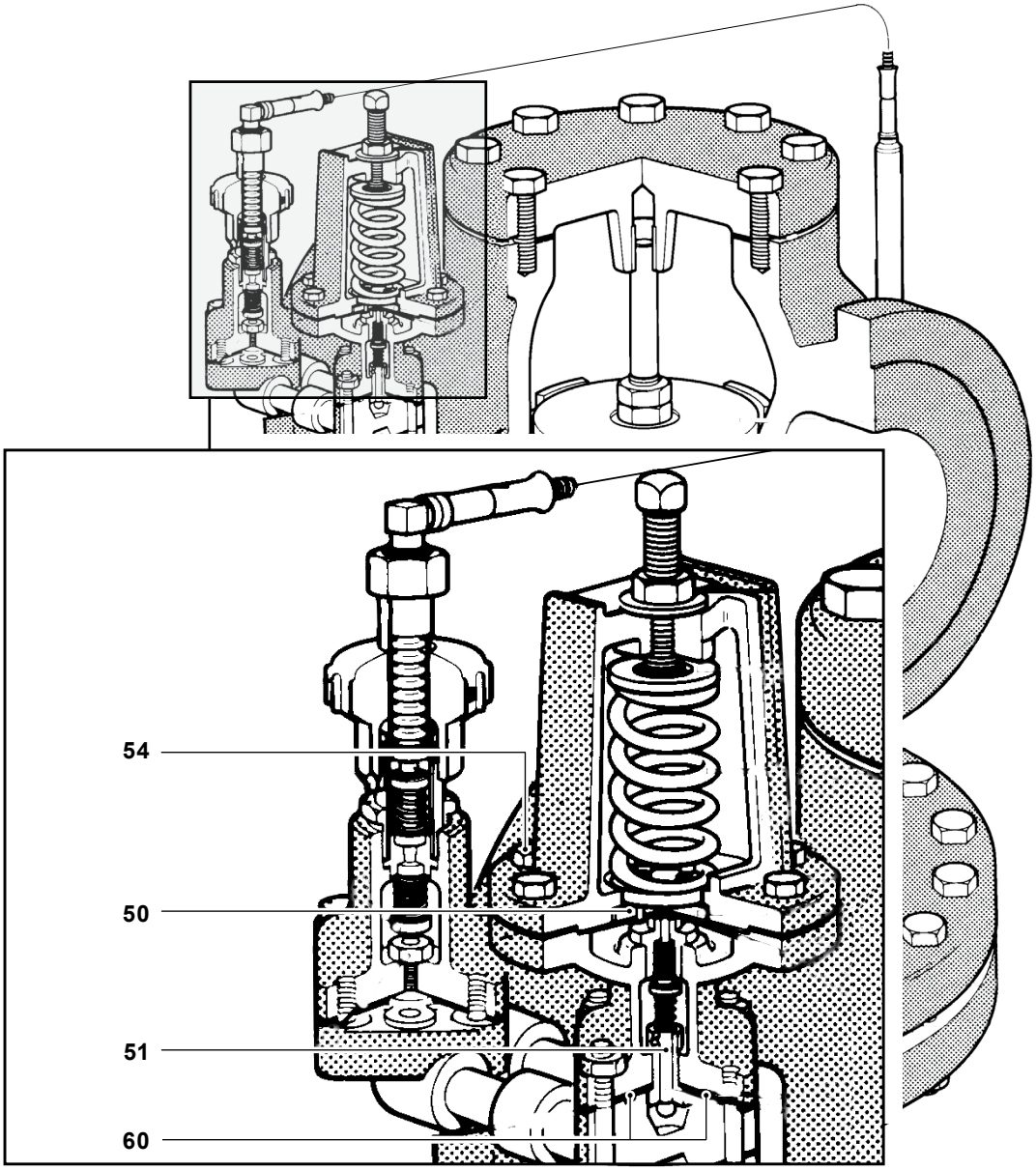
Materials (continued)



No.	Part	Material	
43	Adjustment Screw	Stainless steel	AISI 304
44	Jam Nut	Brass	ASTM B16
45	Pilot Valve Spring	Steel	AISI 1060
46	Upper Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
47	Lower Diaphragm Case	Cast iron	ASTM A 126 CL B
		Cast steel	ASTM A 216 WC B
48	Spring Plate	Steel	ASTM A569
49	Diaphragm	Stainless steel	ASTM A240

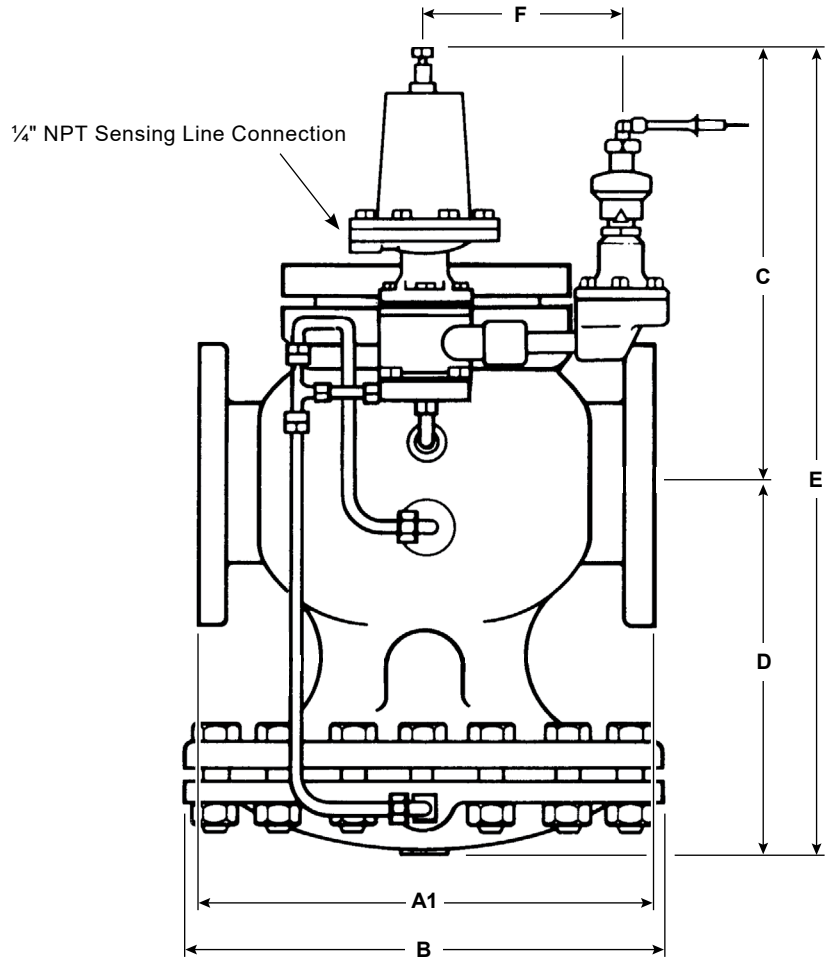
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Materials (continued)



No.	Part	Material	
50	Diaphragm Plate	Brass	ASTM B36
51	Head & Seat Assembly	Stainless steel	AISI 440
		Stainless steel	AISI 440F
54	Diaphragm Case Screws	Steel 5/16" - 18 x 1"	ASTM A449
60	Pilot Gasket	Graphite	

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Size	ANSI 125/150 A1	ANSI 250/300 A1	B	C	D	E	F	Weight
6"	18.1 (460)	18.9 (481)	19.75 (502)	16.1 (408)	17.1 (435)	33.2 (843)	5.0 (127)	595 (270)

Sample specification

Pressure/Temperature Regulators shall be of the pilot-actuated, diaphragm-operated type with separate pressure and temperature pilots. The main valve shall be single-seated, with hardened stainless steel trim; the regulator body shall be cast iron. The pilots shall be removable without disturbing the control connections. The temperature setting shall be adjustable without the use of tools, and the set point shall be indicated on a calibrated dial. The thermostatic system shall be solid fill, and shall incorporate overheat protection.

Installation

The regulator should be installed in a horizontal line with suitable bypass and isolating valves. A steam trap should be installed upstream to prevent condensate from reaching the regulator. The trap and regulator should both be protected with a strainer separator set. The thermostatic bulb must be carefully located in the medium being heated. The pressure sensing line may be located either in the downstream or in the steam space. Complete installation instructions are given in IM-P717-05-US.

Maintenance

Complete installation and maintenance instructions are given in IM-P717-05-US and ADVP 3029, a copy of which is supplied with each regulator. Available spare parts are shown on TI-P335-11 and TI-P235-02.

TI-P235-18-US
Issue 1

Sizing and Selection Chart
25T, 25TE, 25E, 25PT, 25PTE

How to Select and Size

25T and 25TE Temperature Controls
25E Electric On/Off Valve
25PT and 25PTE Pressure/Temperature Controls

Select the pilot or pilots best suited to the application, then determine the regulator size required to meet the steam capacity load. Satisfactory temperature control and low control maintenance depend on sizing each regulator correctly for its intended application.

Too large a regulator may tend to hunt or it may operate for long periods with the main valve just barely cracked open. Wire drawing – the erosive scouring of high-velocity steam – can subject an oversized valve seat to premature wear.

Too small a regulator will not meet peak heating load requirements. It will increase the time a system requires for coming up to temperature during start-up.

Size of the regulator should be determined by actual steam capacity requirements, not by pipe sizes in the system. For most applications, regulator size will be smaller than the sizes of connected piping.

Determining steam capacity

For heating water with steam: lbs. of steam/h = $\frac{\text{GPM}}{2}$ x temp rise ˚F x 1.1

For heating fuel oil with steam: lbs. of steam/h = $\frac{\text{GPM}}{4}$ x temp rise ˚F x 1.1

For heating air with steam coils: lbs. of steam/h = $\frac{\text{CFM}}{800}$ x temp rise ˚F

For radiation: lbs. of steam/h = $\frac{\text{sq. ft. EDR}}{4}$

How to size a valve

Proper regulator sizing requires the following information:

1) The steam capacity required for the application in pounds per hour.

2) Inlet supply pressure of the steam taken immediately ahead of the regulator.

3) Outlet steam pressure from the allowable pressure drop across the regulator.

Where it is impossible to calculate the pressure drop, 35% to 40% of the gage supply pressure can be used as a reasonable approximation. Noise level increases with the pressure drop. Install regulator with properly sized piping.

Example

Determine what size Spirax Sarco 25T Temperature Regulator will be required for an instantaneous water heater heating 20 GPM of water from 60˚ to 160˚F (15.5 °C to 71.1 °C).

Steam supply pressure at the heater is 75 psi g (5.17 bar g). Permissible drop across the regulator is 20 psi (1.37 bar).

Solution: Using formula for heating water:

$$\text{lbs. of steam/hr.} = \frac{\text{GPM}}{2} \times \text{temp rise } ^\circ\text{F} \times 1.1$$

$$= \frac{20}{2} \times 100 \times 1.1$$

$$= 1{,}100 \text{ lbs/h } (498 \text{ kg/h})$$

From the capacity chart on the next page, look in the first column for 75 psi g (5.17 bar g) inlet pressure.

In second column, find 55 psi g (3.79 psi g) downstream pressure (75 psi g (5.17 bar g) inlet less 20 psi (1.37 bar) permissible drop).

Follow a horizontal line to the sixth column where we find that a 1" (25.4 mm) regulator is required to supply no less than 1,100 lbs/h (498 kg/h)

Capacities (Pounds of saturated steam per hour)

Inlet steam pressure psi g	Outlet steam pressure psi g	Nominal valve vize										
		½"S (DN15)	½" (DN15)	¾" (DN20)	1" (DN25)	1¼" (DN32)	1½" (DN40)	2" (DN50)	2½" (DN65)	3" (DN80)	4" (DN100)	6" (DN150)
	Cv Factor	1.16	3.48	6.5	10.5	14	20	35	56	74	115	280
†2	0	15	45	85	140	180	260	455	725	960	1,490	
†3	0	19	55	105	170	225	320	560	900	1,185	1,840	
†5	2	20	57	106	171	228	326	572	915	1,200	1,875	
	1	23	70	131	211	282	405	705	1,125	1,490	2,310	
†7	4	21	63	117	189	252	360	630	1,010	1,330	2,070	
	2	27	81	151	245	326	466	815	1,300	1,725	2,680	
† 10	5	29	86	160	260	345	495	865	1,385	1,830	2,840	
	3	37	110	205	332	442	632	1,105	1,770	2,340	3,635	
†12	7	29	90	167	270	360	515	990	1,445	1,910	2,965	
	4	43	128	238	386	515	735	1,285	2,060	2,720	4,220	
†15	10	30	95	175	285	380	540	950	1,500	2,000	3,100	7,140
	8	37	110	210	335	450	640	1,120	1,795	2,370	3,680	8,486
	5	45	135	250	405	545	780	1,365	2,185	2,890	4,480	10,373
20	15	34	101	190	310	410	585	1,025	1,640	2,165	3,365	7,752
	10	47	140	265	425	570	810	1,420	2,270	3,000	4,660	10,741
	0-5	60	180	335	540	720	1,025	1,795	2,870	3,790	5,895	13,592
25	20	36	107	200	325	430	650	1,080	1,725	2.280	3,545	8,160
	15	50	145	270	435	580	830	1,450	2,325	3,070	4,770	11,006
	0-7	70	205	385	620	825	1,180	2,065	3,305	4,360	6,785	15,647
30	24	41	125	230	374	500	715	1,250	1,995	2,640	4,100	9,455
	18	65	195	365	590	785	1,120	1,960	3,135	4,245	6,440	14,851
	0-12	75	230	430	695	925	1,320	2,310	3,695	4,885	7,590	17,503
40	34	45	97	255	410	545	780	1,365	2,180	2,885	4,480	10,338
	24	86	256	478	772	1,030	1,470	2,570	4,115	5,440	8,450	19,492
	0-18	95	280	525	850	1,135	1,620	2,835	4,535	5,995	9,315	21,481
50	42	57	170	320	515	690	985	1,720	2,755	3,640	5,660	13,046
	35	95	275	515	830	1,105	1,58 0	2,765	4,425	5,850	9,085	20,951
	0-21	115	350	650	1,050	1,400	2,000	3,500	5,600	7,400	11,500	26,520
60	50	69	210	385	625	835	1,190	2,085	3,330	4,400	6,845	15,785
	40	110	235	610	990	1,315	1,880	3,290	5,265	6,955	10,810	24,888
	0-27	130	385	720	1,165	1,555	2,220	3,885	6,215	8,215	12,765	29,437

Table continued on next page

Inlet steam pressure psi g	Outlet steam pressure psi g	Nominal valve vize										
		½"S (DN15)	½" (DN15)	¾" (DN20)	1" (DN25)	1¼" (DN32)	1½" (DN40)	2" (DN50)	2½" (DN65)	3" (DN80)	4" (DN100)	6" (DN150)
	Cv Factor	**1.16**	**3.48**	**6.5**	**10.5**	**14**	**20**	**35**	**56**	**74**	**115**	**280**
75	65	75	225	420	675	900	1,285	2,250	3,600	4,760	7,400	17,070
	55	122	365	685	1,100	1,475	2,110	3,695	5,910	7,810	12,135	27,979
	0-35	155	470	875	1,415	1,890	2,700	4,725	7,560	9,990	12,525	35,802
100	85	102	305	575	925	1,235	1,765	3,085	4,940	6,525	10,140	23,384
	75	155	460	865	1,395	1,860	2,660	4,655	7,450	9,840	15,295	35,272
	0-48	200	600	1,120	1,815	2,420	3,460	6,055	9,690	12,800	19,895	45,900
125	110	110	335	625	1,000	1,345	1,920	3,360	5,375	7,100	11,040	25,459
	90	205	615	1,150	1,860	2,480	3,540	6,195	9,910	13,100	20,355	46,920
	0-62	245	730	1,365	2,220	2,940	4,200	7,350	11,760	15,540	24,150	55,692
150	130	140	425	790	1,280	1,700	2,440	4,265	6,825	9,000	14,000	32,314
	105	255	760	1,410	2,290	3,050	4,360	7,630	12,210	16,130	25,100	57,834
	0-76	285	860	1,600	2,590	3,460	4,940	8,645	13,830	18,280	28,400	65,504
175	155	150	450	840	1,360	1,810	2,585	4,525	7,240	9,570	14,870	34,272
	120	300	910	1,700	2,740	3,655	5,220	9,135	14,620	19,310	30,000	69,217
	0-87	330	985	1,840	2,970	3,960	5,660	9,900	15,850	20,950	32,545	75,052
200	170	215	645	1,200	1,950	2,600	3,700	6,490	10,380	13,700	21,300	49,164
	140	330	980	1,830	2,960	3,950	5,640	9,870	15,800	20,870	32,430	74,786
	0-103	375	1,125	2,100	3,390	4,520	6,460	11,300	18,000	23,900	37,145	91,780
250	210	285	850	1,590	2,450	3,430	4,900	8,575	13,700	18,130	28,200	64,974
	175	410	1,220	2,280	3,685	4,920	7,020	12,280	19,660	25,980	40,365	93,085
	0-131	460	1,385	2,590	4,180	5,570	7,960	13,930	22,300	29,450	45,800	105,570
***275**	225	290	880	1,640	2,650	3,530	5,050	8,830	14,130	18,670	29,000	
	200	415	1,240	2,320	3,750	4,990	7,130	12,480	19,980	26,400	41,000	
	0-145	505	1,510	2,830	4,570	6,090	8,700	15,230	24,360	32,200	50,000	
***300**	250	310	920	1,720	2,780	3,700	5,290	9,250	14,800	19,600	30,400	
	225	415	1,250	2,330	3,770	5,020	7,170	12,550	20,100	26,500	41,300	
	0-160	550	1,640	3,070	4,960	6,600	9,440	16,320	26,400	34,900	54,300	

† Specify low pressure main valve and low pressure "T" pilot for 2-½", 3" & 4" at inlet pressures of 15 psi g and below. Not available in cast steel.

6" size not recommended below 15 psi g. "E" pilot is not recommended for use with 2-½", 3" & 4" valves at pressures below 15 psi g.

* Cast steel construction required for service above 250 psi g.

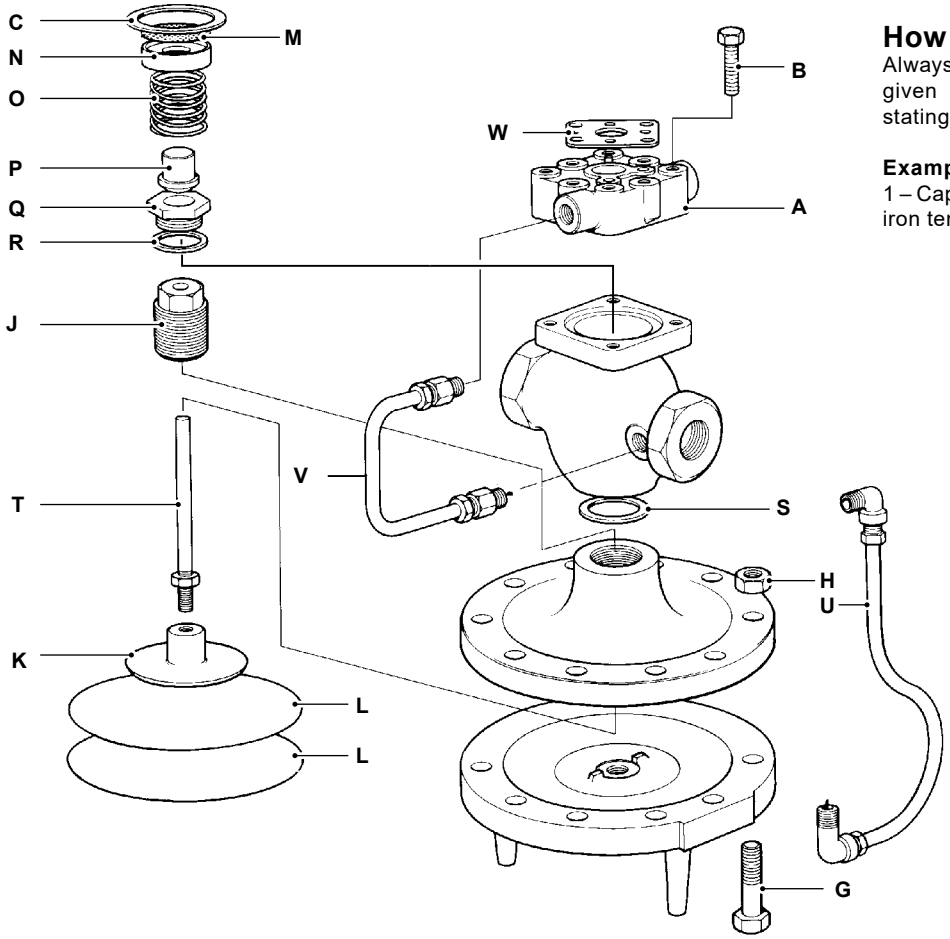
TI-P717-09-US
Issue 2

Spare parts guide
½" to 2" and 2½" to 4"
25- and 26-Series main valves

½" to 2" (DN15 to DN50) 25- and 26-Series main valves

Cap assembly with cap screws and gasket	**A, B, C**
Diaphragm case bolts and nuts	**G, H**
Screen, spring support disc, valve spring and cap gasket	**M, N, O, C**
Cap gasket, valve head, seat and seat gasket (specify regular or reduced port "S" valve)	**C, P, Q, R**
Valve stem guide and gasket	**J, S, T**

Diaphragm (2 per set)	**L**
Transmission tubing with fittings	**U, V**
Gasket kit	**C, R, S, W**
Diaphragm plate	**K**
Rebuild kit	**B, C, L, M, O, P, Q, R, U, V, W**



How to order
Always order spares by using the description given in the column headed Spare Parts, stating the valve size and material.

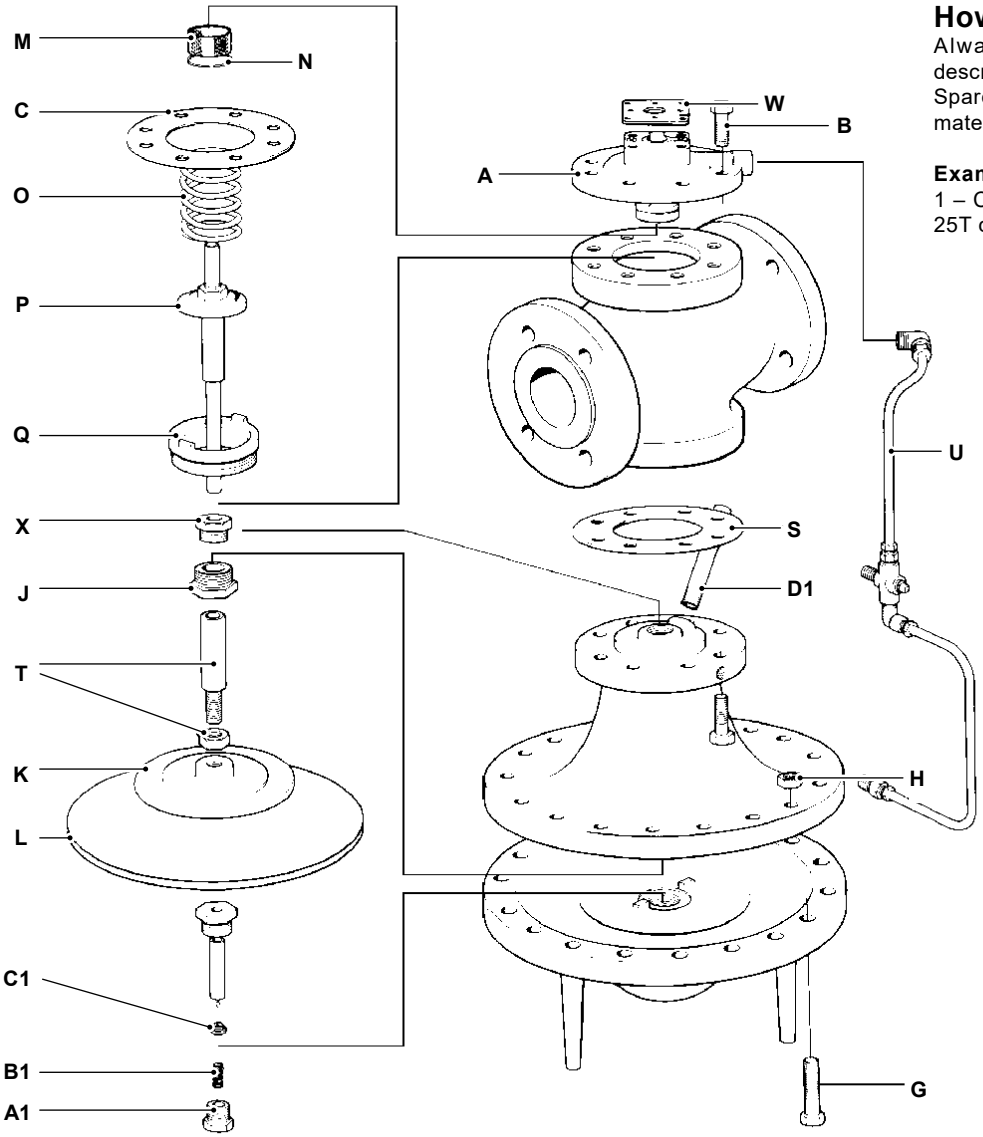
Example:
1 – Cap assembly for ½" Spirax Sarco 25T cast iron temperature regulator.

Maintenance
For complete installation and maintenance instructions, see the IMI sheet, which accompanies the product.

2½" to 4" 25- and 26-Series main valves

Cap assembly with cap screws and gasket	**A, B, C**
Diaphragm case bolts and nuts	**G, H**
Screen, retaining ring, main valve spring and cap gasket cap	**M, N, O, C**
Gasket, valve head and seat (specify regular or reduced port "S" valve)	**C, P, Q, X**
Lower stem and guide	**J, S, T**

Diaphragms (2 per set)	**L**
Transmission tubing with assembly	**U**
Gasket kit	**C, S, W**
Damping assembly	**A1, B1, C1**
Diaphragm plate	**K**
Rebuild kit	**B, C, L, M, N, O, P, Q, U, W**
Relief tube	**D1**



How to order

Always order spares by using the description given in the first column under Spare Parts, stating the valve size and material.

Example:
1 – Cap assembly for 2½" Spirax Sarco 25T cast iron temperature regulator

Maintenance

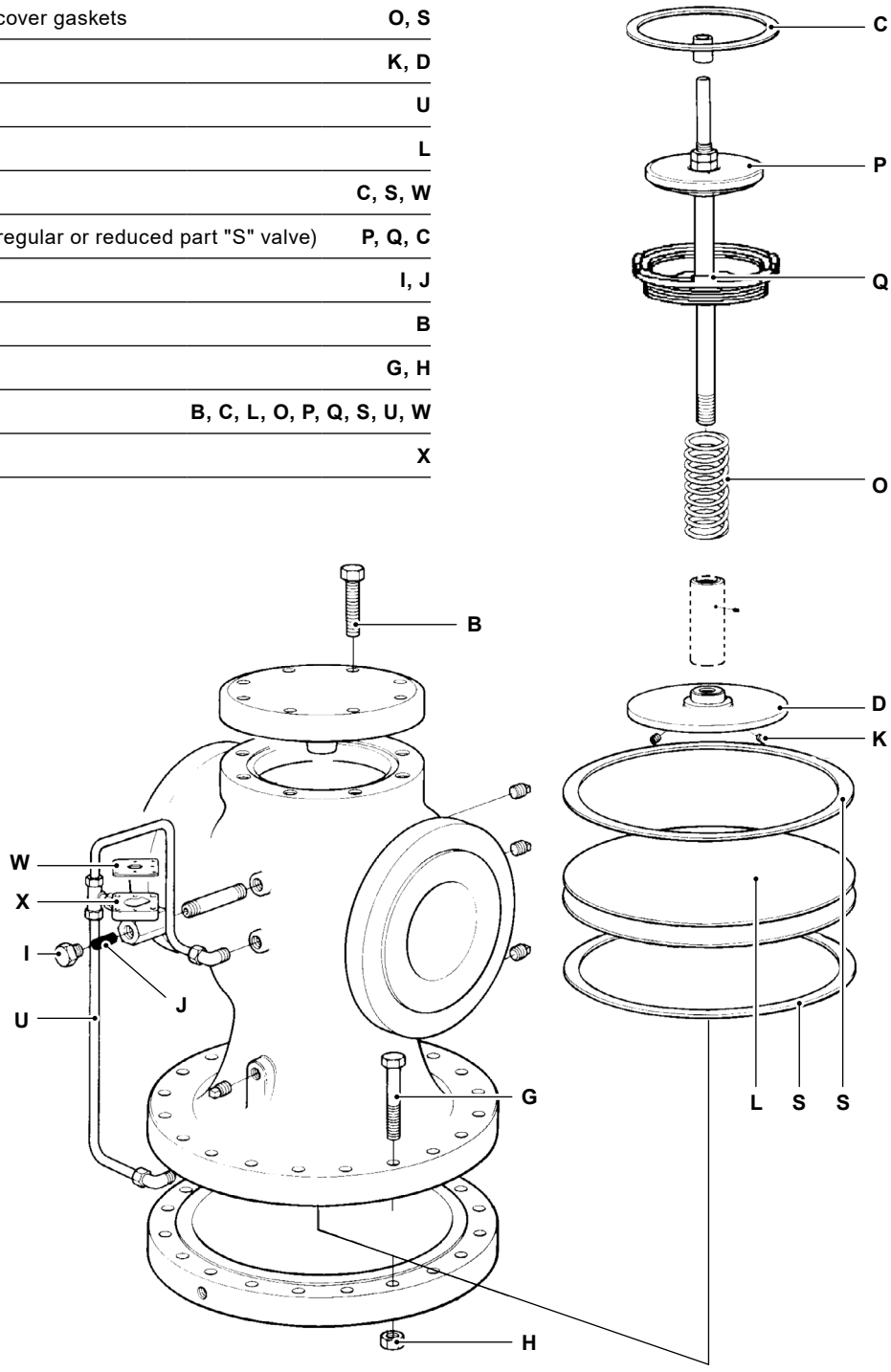
For complete installation and maintenance instructions, see the IMI sheet, which accompanies the product.

TI-P335-11-US
Issue 2

Spare Parts Guide
6" Main Valves

Main valve

Main valve spring and lower diaphragm cover gaskets	O, S
Diaphragm plate and set screws	K, D
Transmission tubing with fittings	U
Diaphragms (2 per set)	L
Gasket kit	C, S, W
Head, stem and seat assembly (specify regular or reduced part "S" valve)	P, Q, C
Screen assembly	I, J
Cover bolt kit	B
Diaphragm case bolt kit	G, H
Rebuild kit	B, C, L, O, P, Q, S, U, W
Pilot platform	X



How to order

Always order spares by using the description given in the first column under Spare Parts, stating the valve size and material.

Example:
1 - Diaphragm plate and set screws for 6" Spirax Sarco 25T cast iron reducing valve.

Maintenance

See installation and maintenance instructions supplied with each valve, copies are available on request.

Main valve seat in 6" regulator is field replaceable. Please consult factory for seat removal tool. To retain tight shut off, minor wear can be corrected by lapping with suitable grinding compound.

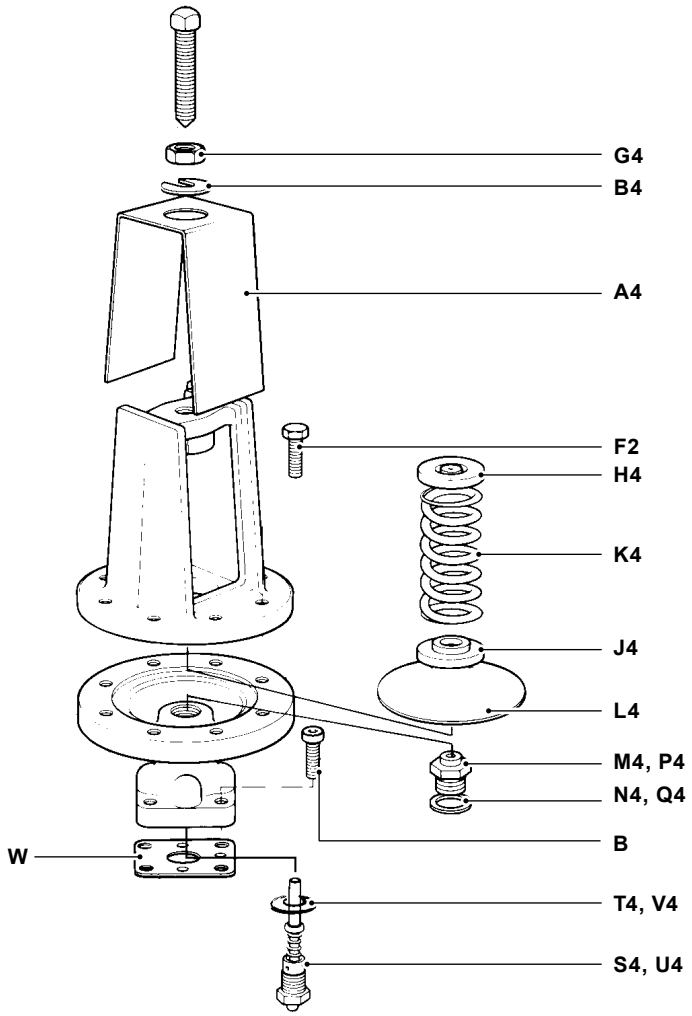
TI-P235-02-US
Issue 2

25 Series Spare Parts Guide
½" to 6" Pilots

Pressure Pilot, P and BP

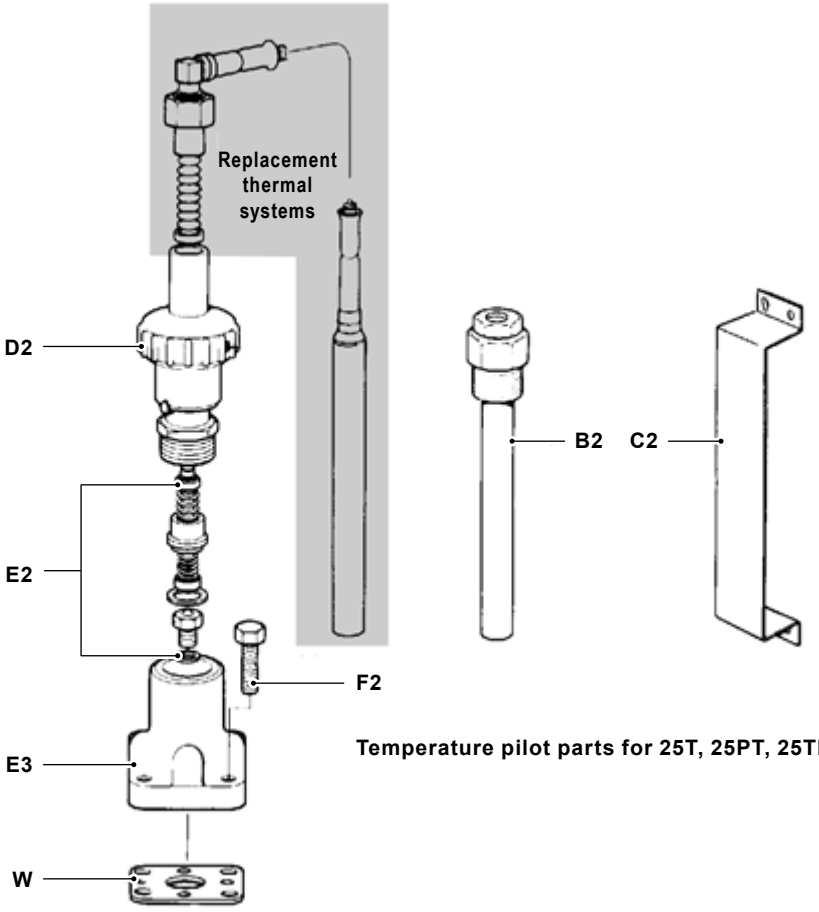
Cover Plate with Retaining Ring	**A4, B4**
Pilot Screws with Gasket	**B, W**
Adjustment Screw with Nut, and Upper	**G4, H4**
and Lower Spring Support Discs	**J4**
Adjustment Spring Specify controlled pressure and spring color Yellow 3 to 30 psi (0.21 to 2.1 bar) Blue 20 to 100 psi (1.4 to 6.9 bar) Red 80 to 250 psi (5.5 to 17.2 bar)	**K4**

Diaphragm (2)	**L4**
Stem Guide with Gasket (25P, 25PA)	**M4, N4**
Stem Guide and Seal Gasket (25BP)	**P4, Q4**
Head and Seat Assembly with Gasket (25P, 25PA and 25MP)	**S4, T4**
Head and Seat Assembly (25BP)	**U4, V4**
Square Gasket for all Pilots (set of 3)	**W**
Pilot Kit	**L4, M4, N4, S4, T4, W**



Temperature pilot see TI-1-1123-US

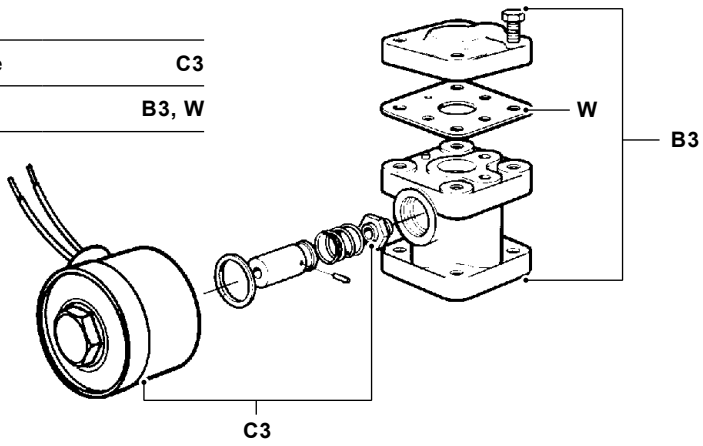
Thermal System (T1, T2, T3, T10, T11) State bulb style, capillary tube length and temperature range	**A2**
Well (T5, T6, T7, T8, T4) State bulb style	**B2**
Wall Mounting Bracket (T9) State bulb style	**C2**
Pilot Body Assembly	**W**
Body with Cap Screws and Gaskets (Specify 15 psi g (1.0 bar) or below assembly or standard assembly)	**E2, F2, W**
Head and Guide Assembly w/ Gasket, Seat and Seat Gasket (Specify 15 psi g (1.0 bar) or below assembly or standard assembly)	**E2**



Temperature pilot parts for 25T, 25PT, 25TE, 25PTE and 25MT

Electric pilot

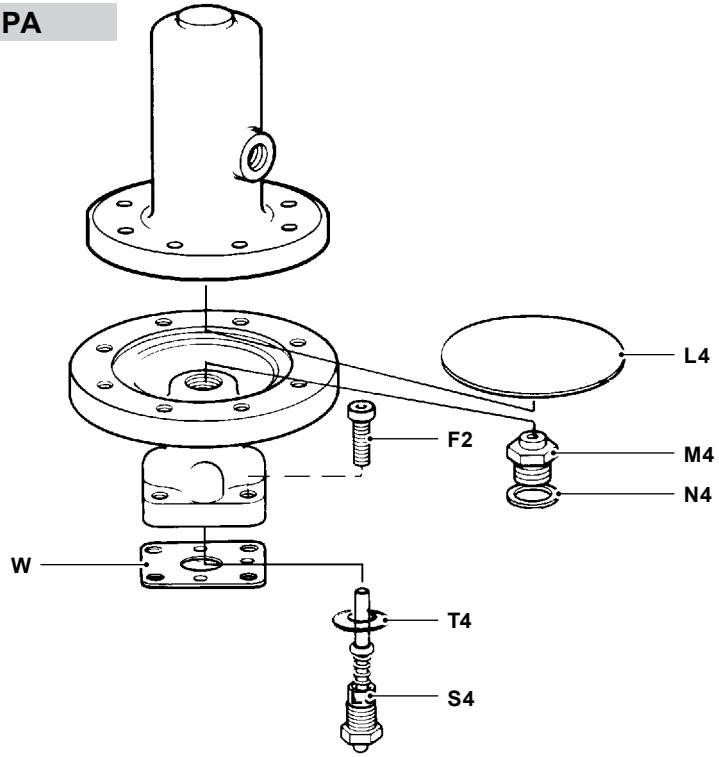
NEMA 4 and 7 Solenoid specify voltage and steam pressure	**C3**
Complete "E" Pilot Body Assembly	**B3, W**



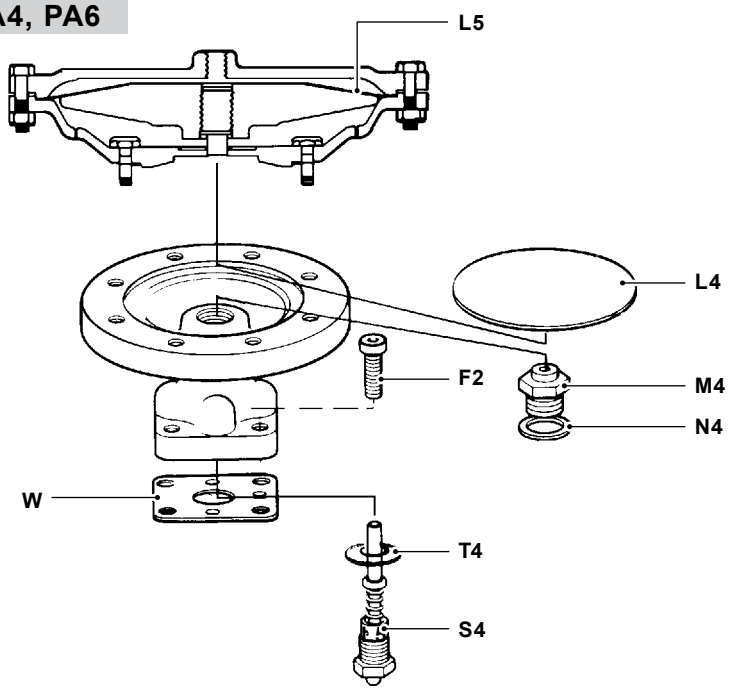
PA (air loaded) Pilot

Pilot Mounting Screws	**F2**
Lower Diaphragm (**2**)	**L4**
Upper Diaphragm for PA4	**L5**
Upper Diaphragm for PA6	**L5**
Stem Guide with Gasket	**M4, N4**
Head and Seat Assembly with Gasket	**S4, T4**
Square Gasket for all Pilots	**W**

PA



PA4, PA6



How to order

Always order spares by using the description given in the first column under Spare Parts, stating the valve size and material.
When ordering temperature pilots, specify the bulb style, capillary length and temperature range.
When ordering electric pilots, specify electrical characteristics, pressures and size of main valve.

Example: 1 – Thermal System style T1 for 2**"** Spirax Sarco 25PT Pressure Temperature control with 8-ft capillary tubing and temperature range 120˚F to 180˚F.

1 – NEMA 4 Solenoid for 1½**"** Spirax Sarco 25PE Reducing Valve with 115 volt, 60 Hz AC coil steam pressure 200 psi.

Maintenance

See installation and maintenance instructions supplied with each valve, copies are available on request.

TI-P139-04-US
Issue 1

Acoustic Blankets

Description

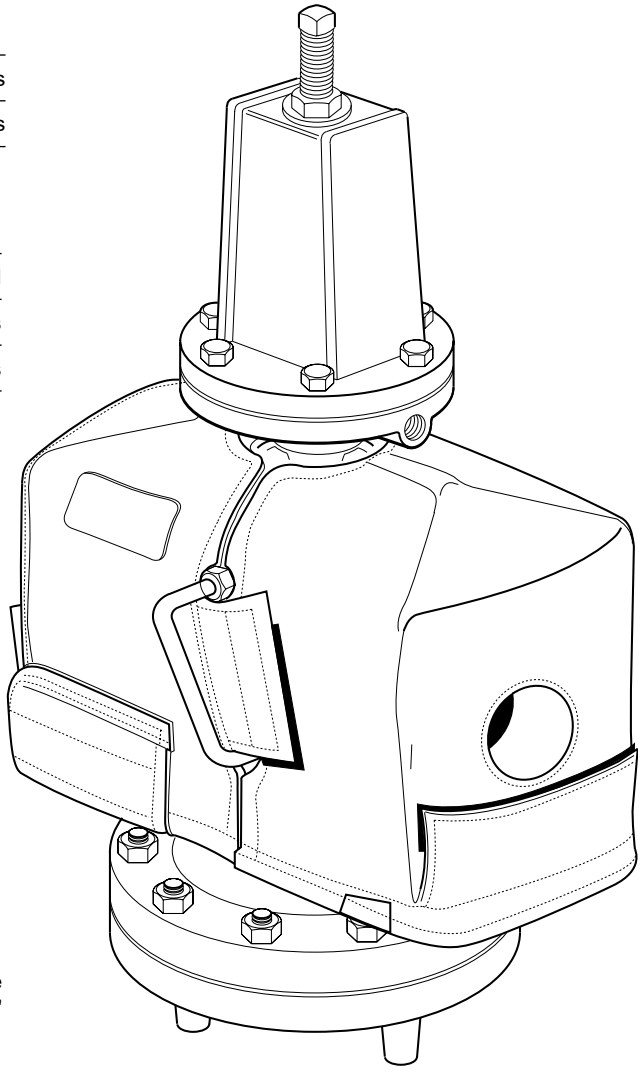
The Spirax Sarco removable Acoustic Blanket is an easy to install, reusable, one-piece asbestos free encapsulation designed specifically to fit and be used on Spirax Sarco 25 series main valves and L and K series control valves. In addition to providing reductions in harmful noise levels by 5 dBa, these blankets also provide insulation to limit heat energy losses. The Acoustic Blanket comes complete with inner and outer chemical resistant teflon fiberglass cloth with 1" thick high density fiberglass mat. Simple, but effective Velcro® fasteners make the blankets easy to install.

Limiting operating conditions

Maximum operating temperature	600 °F (315 °C) continuous
Available range	½" to 6" AB Acoustic Blankets

Materials

Part	Material
Jacket	Teflon Coated Fiberglass
Insulation Mat	Fiberglass



Sizing and Selection

Match Acoustic Blanket size to pilot operated regulator or control valve size regardless of end connection. For example: Select ½" AB for ½" 25P cast iron, NPT pilot operated regulator.

Installation

Check the nameplate on the Acoustic Blanket to be sure you have the correct blanket for your valve. Slip the blanket around the valve making sure the drawstrings are located at the inlet and outlet connections of the valve. Cut-outs for piloted operated regulators are provided to slip around external transmission tubing and pilot assemblies. Attached Velcro® fastening system making sure blanket fits snug to valve.

Safety information, installation and maintenance

Installation
Extra care must be taken if the item is in operation as it is likely to be operating at steam/process temperature. Ensure that adequate personal protection equipment is used to avoid injury.
With the product installed, the insulation jacket can be fitted. Wrap the jacket around the item, locating the holes in the jacket with the features on the product where necessary. Secure the jacket in position using the Velcro fastenings.
Ensuring the jacket is installed centrally on the item, pull tight and securely tie the draw strings.
If needed, disengage and re-attach the Velcro to achieve the tightest possible fit.

Note: Discolouration of the internal jacket material will occur with exposure to heat. This will not impair the performance.

Removal
Before removing the jacket, check if the item is in operation. If so, suitable protective clothing (gloves) should be worn to reduce the risk of burns. Removal is the reverse procedure of the above.

Disposal
This product is not recyclable and is non-combustible. For disposal purposes consider the product to be mineral fibre and dispose of in accordance with local regulations.

Handling
When the jacket is new, the insulation material is fully enclosed within the inner and outer face and retained by the stitching. In this condition, no special protective clothing is required for handling.
If the inner and outer faces have become damaged or unstitched, so as to expose the insulation material, suitable protective clothing (e.g. gloves, safety glasses, face mask and overalls) should be worn.

Spare parts
There are no spare parts available for the insulation jackets.

TI-P108-01-US
Issue 2

Acoustic Plates

Description

The Spirax Sarco model AP Acoustic Plate is designed to graduate the expansion across a valve, and therefore reduce valve noise. The acoustic plate absorbs the impact of the vent pressure at the downstream side of the valve. It distributes the steam flow and provides a noise frequency shift to reduce the perceived noise using a multiple hole orifice pattern in the plate inserted on the downstream side of the valve. Noise level reductions of up to 10 dBa can be achieved.

Limiting operating conditions

Maximum operating pressure	250 psi g (17.2 bar g)
Maximum operating temperature	650 °F (343 °C)
Pressure drop	Less than 1%

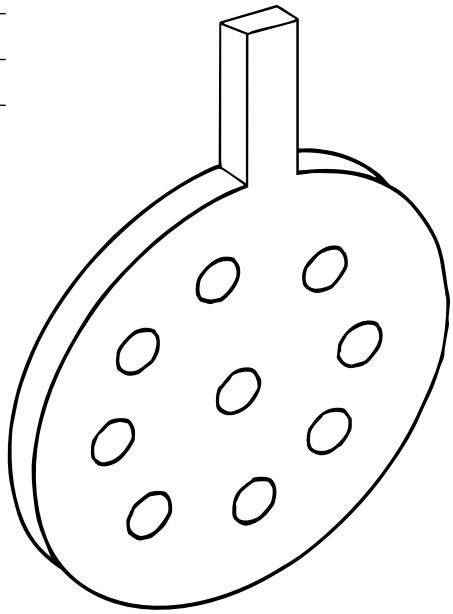
Standard connections - AP plates are installed between standard flanges:
ANSI 150 RF flange designated "A"
ANSI 300 RF flange designated "B"

Installation

The Series AP Acoustic Plate is designed to reduce control valve and/or regulator noise. The plate is installed between standard ANSI 125/150 flanges or ANSI 250/300 downstream of a valve and reorients the normal exit turbulence of the steam flow. Noise reduction of up to 10 dBa can be achieved. The plates can be used in conjunction with D series noise diffusers and acoustic silencers for additional noise attenuation. See below for dimensions.

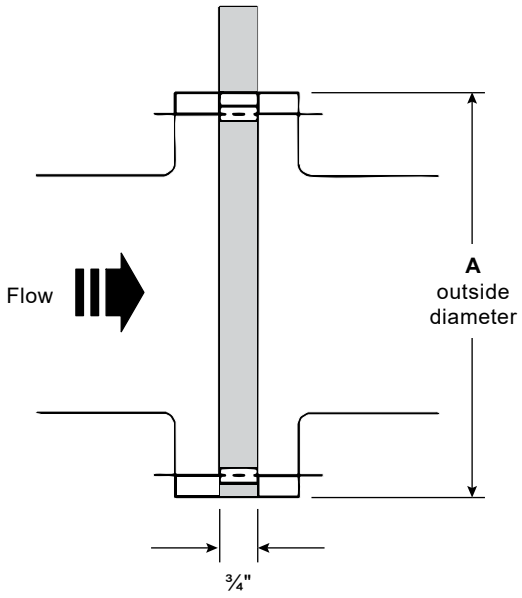
Materials

Part	Material
Plate	Cast steel



Dimensions/weights (nominal) in inches (mm) and lbs (kg)

Nominal pipe size	Dimension A of ANSI 150 Flange	Dimension A of ANSI 300 Flange	Average weight
½"	1.75 (44)	2 (51)	1 (0.5)
¾"	2.12 (54)	2.5 (64)	3.4 (1.5)
1"	2.5 (64)	2.75 (70)	3.6 (1.6)
1¼"	2.88 (73)	3.12 (79)	4.3 (2.0)
1½"	3.25 (83)	3.62 (92)	6 (2.7)
2"	4 (102)	4.25 (108)	6.5 (2.9)
2½"	4.75 (121)	5 (127)	10 (4.5)
3"	5.25 (133)	5.75 (146)	11.5 (5.2)
4"	6.75 (171)	7 (178)	12.4 (5.6)
6"	8.62 (219)	9.75 (248)	14 (6.4)
8"	10.88 (276)	12 (305)	14 (6.4)



How to order quantity one of:

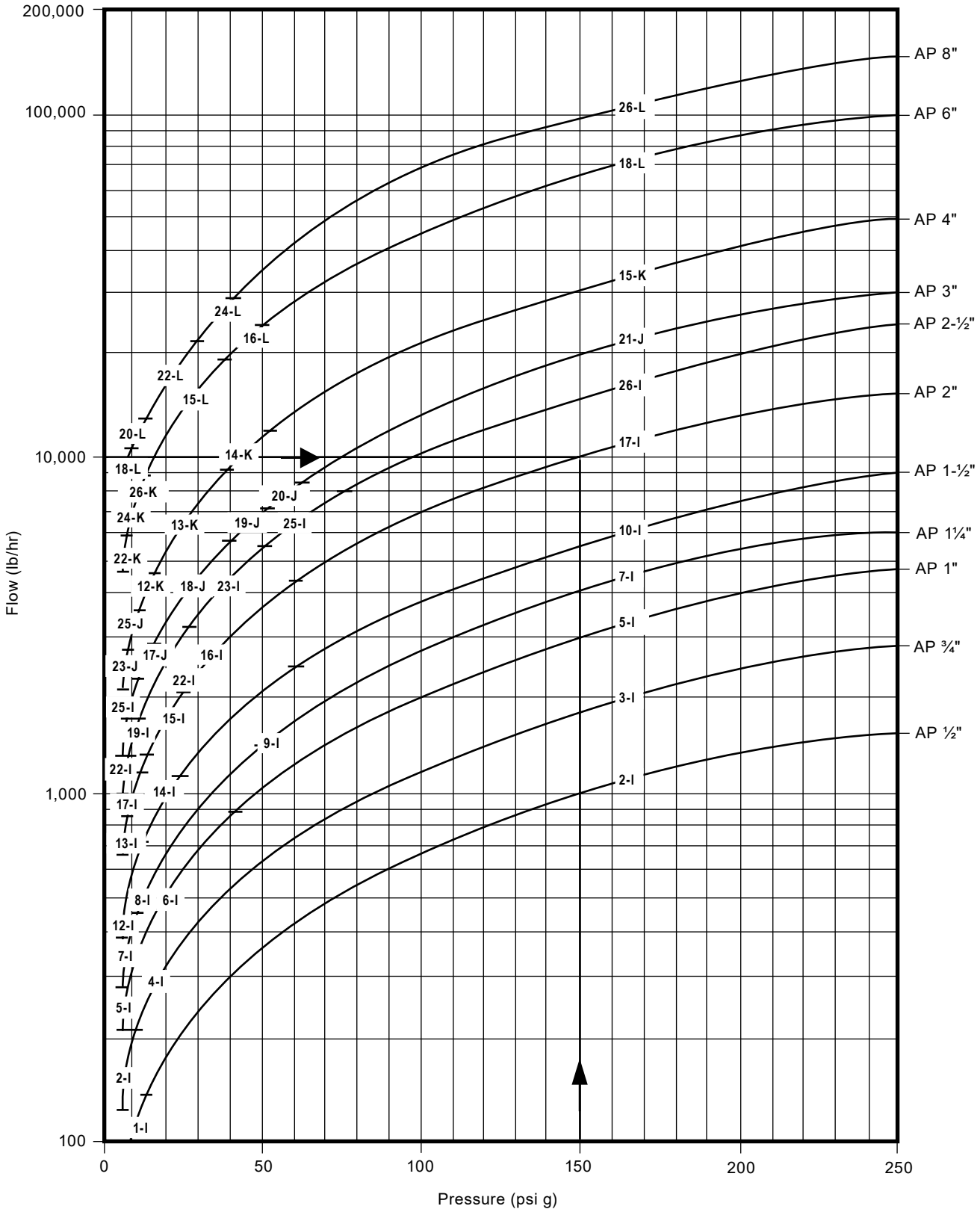
AP	-	1½"	A	-	10-I
Acoustic Plate		Size	Flange		No. of Holes and Configurations

Sizing and Selection Chart for Acoustic Plates

How to use the sizing chart

Select correct acoustic plate by known flow rates (lb/hr.) and inlet pressure of control valve or regulator.
Example: Inlet pressure of control valve 150 psi g @ 10,000 lb./hr.

- Move horizontal to intersect with 150 psi g.
- Follow 150 psi g line vertically to intersect with 10,000 lb./hr. horizontal line.
- Select AP 2" - 17 - I.



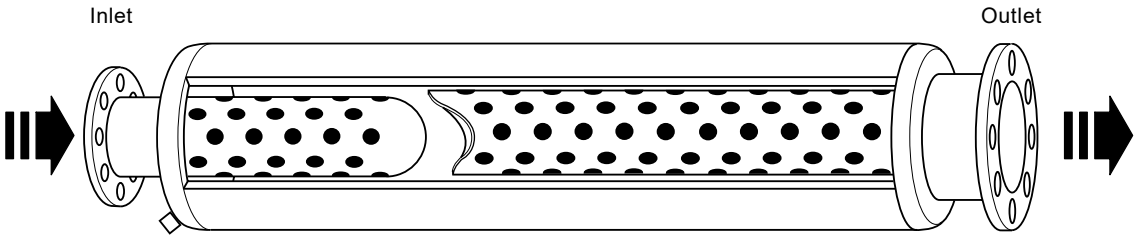
TI-P108-02-US
Issue 2

Acoustic Silencers

Description

The Spirax Sarco acoustic silencer is designed to attenuate noise generated by control valves and/or pilot operated regulators. The silencers are particularly effective in limiting the propagation of valve generated noise into the downstream piping.

Upon flow and piping configuration, noise attenuation of 20-30 dB based on noise frequency.



¾" NPT drain connection with plug

LCV series

Limiting operating conditions

Maximum operating pressure	300 psi g (21 bar g)
Maximum operating temperature	650 °F (343 °C)
Standard range	½" to 24" LCV Acoustic Silencers.
Connections	Standard connections ANSI 300 lb. raised face flange. ¾" - 3000 lb. drain with plug. Options of ANSI 150 lb. raised face flange available.

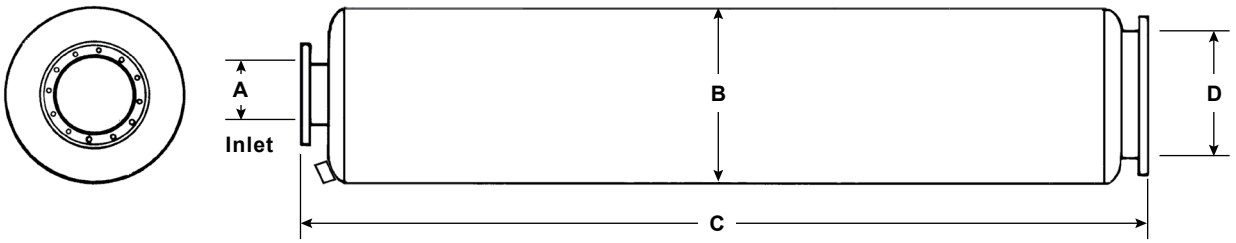
Materials

Part	Material
Silencer	All welded steel. ASME Section VIII Div I
Insulation mat	Fiberglass

Installation

Connect the inlet of the silencer directly to the outlet connection of the valve. The required pipeline expansion takes place within the silencer. This expanded outlet feature eliminates the expense associated with separate expansion fittings. A suitable float and thermostatic steam trap is recommended for removing condensate from the silencer. The drain connection must always point vertically down.

Dimensions/weights (nominal) in inches and pounds



Model	A	B	C	D	Weight
LCV-2	½" to 2"	5"	35"	2"	120
LCV-3	½" to 3"	6½"	46"	3"	150
LCV-4	½" to 4"	10"	52"	4"	200
LCV-5	¾" to 4"	12"	60"	5"	250
LCV-6	2" to 6"	12"	66"	6"	400
LCV-8	2" to 6"	14"	72"	8"	550
LCV-10	1¼" to 6"	16"	78"	10"	650
LCV-12	2" to 6"	18"	90"	12"	800
LCV-14	2½" to 6"	20"	104"	14"	1200
LCV-16	2½" to 6"	22"	116"	16"	1500
LCV-18	3" to 6"	24"	132"	18"	1750
LCV-20	4" to 6"	26"	146"	20"	2200
LCV-22	6"	30"	158"	22"	2800
LCV-24	6"	30"	174"	24"	3100
LCV-26	6"	32"	186"	26"	3500
LCV-28	6"	36"	202"	28"	4850
LCV-30	6"	36"	216"	30"	5000

Frequency table

Frequency (Hz)	63	125	250	500	1K	2K	4K	8K
DIL (ΔdBa)	-7	-15	-23	-30	-32	-30	-27	-24

Sizing acoustic silencers

Select correct silencer by known flow rates (lb/hr), inlet, outlet pressue (psig) and size of regulator or control valve.

Example: -
- Inlet pressure to IN 25P regulator is 100 psi g, outlet pressure is 60 psi g @ 2400 lb/hr.
- Move horizontal accross the 100 psig inlet line to 60 psig outlet to vertically intersect with a 1" regulator to meet or exceed capacity of 2400 lb/hr.
- Selection 1" LCV-2.

Inlet pressure (psi g)	Outlet pressure (psi g)	Valve Size							
		½"		¾"		1"		1¼"	
		Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model
15	10	855	LCV-2	855	LCV-2	855	LCV-2	855	LCV-2
	5	695	LCV-2	695	LCV-2	695	LCV-2	695	LCV-2
	3	630	LCV-2	630	LCV-2	630	LCV-2	630	LCV-2
20	12	920	LCV-2	920	LCV-2	920	LCV-2	920	LCV-2
	8	795	LCV-2	795	LCV-2	795	LCV-2	795	LCV-2
	0-5	520	LCV-2	520	LCV-2	1 145	LCV-3	1 145	LCV-3
25	15	1 020	LCV-2	1 020	LCV-2	1 020	LCV-2	1 020	LCV-2
	10	855	LCV-2	855	LCV-2	855	LCV-2	855	LCV-2
	0-7	520	LCV-2	520	LCV-2	1 145	LCV-3	1 145	LCV-3
30	20	1 175	LCV-2	1 175	LCV-2	1 175	LCV-2	1 175	LCV-2
	15	1 020	LCV-2	1 020	LCV-2	1 020	LCV-2	1 020	LCV-2
	0-12	520	LCV-2	520	LCV-2	1 145	LCV-3	1 145	LCV-3
40	30	1 485	LCV-2	1 485	LCV-2	1 485	LCV-2	1 485	LCV-2
	25	1 330	LCV-2	1 330	LCV-2	1 330	LCV-2	1 330	LCV-2
	0-18	520	LCV-2	1 145	LCV-3	1 145	LCV-3	1 145	LCV-3
50	40	1 795	LCV-2	1 795	LCV-2	1 795	LCV-2	1 795	LCV-2
	30	1 485	LCV-2	1 485	LCV-2	1 485	LCV-2	1 485	LCV-2
	0-21	520	LCV-2	1 145	LCV-3	1 145	LCV-3	2 305	LCV-4
60	45	1 950	LCV-2	1 950	LCV-2	1 950	LCV-2	1 950	LCV-2
	35	1 640	LCV-2	1 640	LCV-2	1 640	LCV-2	1 640	LCV-2
	0-27	250	LCV-2	1 145	LCV-3	2 305	LCV-4	2 305	LCV-4
75	60	2 405	LCV-2	2 405	LCV-2	2 405	LCV-2	2 405	LCV-2
	50	2 010	LCV-2	2 010	LCV-2	2 010	LCV-2	2 010	LCV-2
	0-35	520	LCV-2	1 145	LCV-3	2 305	LCV-4	2 305	LCV-4
85	70	2 705	LCV-2	2 705	LCV-2	2 705	LCV-2	2 705	LCV-2
	50	2 100	LCV-2	2 100	LCV-2	2 100	LCV-2	2 100	LCV-2
	0-43	520	LCV-2	1 145	LCV-3	2 305	LCV-4	2 305	LCV-4
100	80	3 005	LCV-2	3 005	LCV-2	3 005	LCV-2	3 005	LCV-2
	60	2405	LCV-2	2 405	LCV-2	2 405	LCV-2	2 405	LCV-2
	0-48	1 145	LCV-3	1 145	LCV-3	2 305	LCV-4	3 490	LCV-5
125	100	3 600	LCV-2	3 600	LCV-2	3 600	LCV-2	3 600	LCV-2
	80	3 005	LCV-2	3 005	LCV-2	3 005	LCV-2	3 005	LCV-2
	0-62	1 145	LCV-3	2 305	LCV-4	2 305	LCV-4	3 490	LCV-5

Table continued on next page

Sizing acoustic silencers (continued)

Inlet pressure (psi g)	Outlet pressure (psi g)	Valve Size							
		½"		¾"		1"		1¼"	
		Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model
150	125	4 155	LCV-2	4 155	LCV-2	4 155	LCV-2	4 155	LCV-2
	100	3 600	LCV-2	3 600	LCV-2	3 600	LCV-2	3 600	LCV-2
	0-76	1 145	LCV-3	2 305	LCV-4	3 490	LCV-5	3 490	LCV-5
175	150	5 110	LCV-2	5 110	LCV-2	5 110	LCV-2	5 110	LCV-2
	125	4 155	LCV-2	4 155	LCV-2	4 155	LCV-2	4 155	LCV-2
	0-87	1 145	LCV-3	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6
200	150	5 110	LCV-2	5 110	LCV-2	5 110	LCV-2	5 110	LCV-2
	125	4 155	LCV-2	4 155	LCV-2	4 155	LCV-2	9 560	LCV-3
	0-103	1 145	LCV-3	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6
225	175	5 815	LCV-2	5 815	LCV-2	5 815	LCV-2	5 815	LCV-2
	150	5 110	LCV-2	5 110	LCV-2	5 110	LCV-2	5 110	LCV-2
	0-117	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6	5 035	LCV-6
250	200	6 560	LCV-2	6 560	LCV-2	6 560	LCV-2	6 560	LCV-2
	150	5 110	LCV-2	5 110	LCV-2	5 110	LCV-2	11 250	LCV-3
	0-131	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6	8 530	LCV-8
275	225	7 285	LCV-2	7 285	LCV-2	7 285	LCV-2	7 285	LCV-2
	200	6 500	LCV-2	6 500	LCV-2	6 500	LCV-2	6 500	LCV-2
	0-145	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6	8 530	LCV-8
300	250	8 025	LCV-2	8 025	LCV-2	8 025	LCV-2	8 025	LCV-2
	225	7 285	LCV-2	7 285	LCV-2	7 285	LCV-2	7 285	LCV-2
	0-160	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6	8 530	LCV-8

Table continued on next page

Sizing acoustic silencers (continued)

Inlet pressure (psi g)	Outlet pressure (psi g)	Valve Size							
		1½"		2"		2½"		3"	
		Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model
15	10	855	LCV-2	1 885	LCV-3	1 885	LCV-3	3 790	LCV-4
	5	1 530	LCV-2	1 530	LCV-3	3 075	LCV-4	3 075	LCV-4
	3	1 385	LCV-3	2 780	LCV-4	2 785	LCV-4	4 215	LCV-5
20	12	920	LCV-2	2 025	LCV-3	2 025	LCV-3	4 065	LCV-4
	8	1 745	LCV-3	1 745	LCV-3	3 510	LCV-4	3 510	LCV-4
	0-5	1 145	LCV-3	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6
25	15	1 020	LCV-2	2 245	LCV-3	4 510	LCV-4	4 510	LCV-4
	10	1 895	LCV-3	3 790	LCV-4	3 790	LCV-4	5 740	LCV-5
	0-7	2 305	LCV-4	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6
30	20	1 175	LCV-2	2 585	LCV-3	2 585	LCV-3	5 190	LCV-4
	15	2 245	LCV-3	2 245	LCV-3	4 510	LCV-4	6 830	LCV-5
	0-12	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6	5 035	LCV-6
40	30	1 485	LCV-2	3 275	LCV-3	3 275	LCV-3	6 575	LCV-4
	25	2 930	LCV-3	2 930	LCV-3	5 885	LCV-4	5 885	LCV-4
	0-18	2 305	LCV-4	3 490	LCV-5	5 035	LCV-6	8 530	LCV-8
50	40	1 795	LCV-2	3 955	LCV-3	3 955	LCV-3	7 940	LCV-4
	30	3 275	LCV-3	3 275	LCV-3	6 575	LCV-4	9 955	LCV-6
	0-21	2 305	LCV-4	5 035	LCV-6	8 530	LCV-8	8 530	LCV-8
60	45	1 950	LCV-2	4 290	LCV-3	:8 615	LCV-4	8 615	LCV-4
	35	3 615	LCV-3	3 615	LCV-3	7 260	LCV-4	10 995'	LCV-5
	0-27	2 305	LCV-4	5 035	LCV-6	8 530	LCV-8	8 530	LCV-8
75	60	2 405	LCV-2	5 295	LCV-3	5 295	LCV-3	10 635	LCV-4
	50	4 825	LCV-3	4 825	LCV-3	9 290	LCV-4	9 290	LCV-4
	0-35	3 490	LCV-5	5 035	LCV-6	8 530	LCV-8	13 430	LCV-10
85	70	2 705	LCV-2	5 955	LCV-3	5 953	LCV-3	11 960	LCV-4
	50	4 625	LCV-3	9 290	LCV-4	9 290	LCV-4	14 075	LCV-5
	0-43	3 490	LCV-5	8 530	LCV-8	8 530	LCV-8	13 430	LCV-10
100	80	3 005	LCV-2	6 620	LCV-3	6 620	LCV-3	13 290	LCV-4
	60	5 295	LCV-3	10 635	LCV-4	10 635	LCV-4	16 110	LCV-5
	0-48	3 490	LCV-5	8 530	LCV-8	13 430	LCV-10	13 430	LCV-10
125	100	3 600	LCV-2	7 930	LCV-3	7 930	LCV-3	15 920	LCV-4
	80	6 615	LCV-3	13 285	LCV-4	13 285	LCV-4	20 125	LCV-5
	0-62	5 035	LCV-6	8 530	LCV-8	13 430	LCV-10	19 030	LCV-12
150	125	4 155	LCV-2	9 560	LCV-3	9 560	LCV-3	19 195	LCV-4
	100	7 930	LCV-3	15 920	LCV-4	15 920	LCV-4	24 115	LCV-5
	0-76	5 035	LCV-6	13 430	LCV-10	19 030	LCV-12	19 030	LCV-12

Table continued on next page

Sizing acoustic silencers (continued)

Inlet pressure (psi g)	Outlet pressure (psi g)	Valve Size			
		4"		6"	
		Max.lb/hr:	Model	Max.lb/hr:	Model
15	10	3 790	LCV-4	8 280	LCV-6
	5	4 675	LCV-5	11 370	LCV-8
	3	6 080	LCV-8	16 210	LCV-10
20	12	4 065	LCV-4	15 040	LCV-8
	8	5 315	LCV-5	12 985	LCV-6
	0-5	8 530	LCV-8	13 430	LCV-10
25	15	6 830	LCV-5	16 685	LCV-8
	10	8 280	LCV-6	22 080	LCV-10
	0-7	8 530	LCV-8	19 030	LCV-12
30	20	5 190	LCV-4	19 210	LCV-8
	15	9 850	LCV-6	16 665	LCV-8
	0-12	8 530	LCV-8	19 030	LCV-12
40	30	6 575	LCV-4	14 360	LCV-6
	25	8 910	LCV-5	21 770	LCV-8
	0-18	13 430	LCV-10	23 015	LCV-14
50	40	7 940	LCV-4	17 350	LCV-6
	30	14 360	LCV-6	24 315	LCV-8
	0-21	13 430	LCV-10	30 225	LCV-16
60	45	13 050	LCV-5	31 880	LCV-8
	35	16 860	LCV-6	26 860	LCV-8
	0-27	13 430	LCV-10	30 225	LCV-16
75	60	10 635	LCV-4	23 235	LCV-6
	50	14 075	LCV-5	34 375	LCV-8
	0-35	19 030	. LCV-12	38 395	LCV-18
85	70	11 960	LCV-4	26 125	LCV-6
	50	20 300	LCV-6	54 125	LCV-10
	0-43	19 030	LCV-12	47 530	LCV-20
100	80	13 290	LCV-4	29 030	LCV-6
	60	23 235	LCV-6	61 950	LCV-10
	0-48	23 105	LCV-14	47 530	LCV-20
125	100	15 920	LCV-4	34 765	LCV-6
	80	29 025	LCV-6	77 390	LCV-10
	0-62	30 225	LCV-16	57 851	LCV-22
150	125	19 195	LCV-4	41 935	LCV-6
	100	34 785	LCV-6	111 815	LCV-10
	0-76	30 225	LCV-16	68 755	LCV-24

Table continued on next page

Sizing acoustic silencers (continued)

Inlet pressure (psi g)	Outlet pressure (psi g)	Valve Size							
		1½"		2"		2½"		3"	
		Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model	Max.lb/hr:	Model
175	150	5 110	LCV-2	5 110	LCV-2	11 250	LCV-3	11 250	LCV-3
	125	9 560	LCV-3	9 560	LCV-3	19 195	LCV-4	19 195	LCV-4
	0-87	8 530	LCV-8	13 430	LCV-10	19 030	LCV-12	23 015	LCV-14
200	150	5 110	LCV-2	11 250	LCV-3	22 585	LCV-4	22 585	LCV-4
	125	9 560	LCV-3	19 195	LCV-4	19 195	LCV-4	29 075	LCV-5
	0-103	8 530	LCV-8	13 430	LCV-10	19 030	LCV-12	30 225	LCV-16
225	175	5 815	LCV-2	12 805	LCV-3	25 715	LCV-4	25 715	LCV-4
	150	11 250	LCV-3	22 585	LCV-4	22 585	LCV-4	34 210	LCV-5
	0-117	8 530	LCV-8	13 430	LCV-10	23 015	LCV-14	30 525	LCV-16
250	200	6 560	LCV-2	14 450	LCV-3	29 010	LCV-4	29 010	LCV-4
	150	11 250	LCV-3	22 585	LCV-4	22 585	LCV-4	34 210	LCV-5
	0-131	8 530	LCV-8	19 030	LCV-12	23 015	LCV-14	30 225	LCV-16
275	225	7 285	LCV-2	16 045	LCV-3	16 045	LCV-4	32 220	LCV-4
	200	14 450	LCV-3	14 450	LCV-3	29 010	LCV-4	29 010	LCV-4
	0-145	13 430	LCV-10	19 930	LCV-12	20 225	LCV-16	38 395	LCV-18
300	250	8 025	LCV-2	17 685	LCV-3	17 685	LCV-3	35 475	LCV-4
	225	7 285	LCV-2	16 048	LCV-3	32 220	LCV-4	32 220	LCV-4
	0-160	13 430	LCV-10	19 030	LCV-12	30 225	LCV-16	38 395	LCV-18

Table continued on next page

Sizing acoustic silencers (continued)

Inlet pressure (psi g)	Outlet pressure (psi g)	Valve Size			
		4"		6"	
		Max.lb/hr:	Model	Max.lb/hr:	Model
175	150	22 585	LCV-4	49 340	LCV-6
	125	29 075	LCV-5	71 015	LCV-8
	0-87	38 395	LCV-18	80 175	LCV-26
200	150	34 210	LCV-5	83 550	LCV-8
	125	41 935	LCV-6	111 815	LCV-10
	0-103	38 395	LCV-18	93 180	LCV-28
225	175	38 950	LCV-5	95 130	LCV-8
	150	49 340	LCV-6	131 550	LCV-10
	0-117	47 530	LCV-20	107 175	LCV-30
250	200	43 940	LCV-5	107 320	LCV-8
	150	49 340	LCV-6	131 555	LCV-10
	0-131	47 530	LCV-20	107 175	LCV-30
275	225	32 220	LCV-5		
	200	43 940	LCV-5		
	0-145	57 650	LCV-22		
300	250	35 475	LCV-4		
	225	48 800	LCV-5		
	0-160	57 650	LCV-22		

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Issue 1

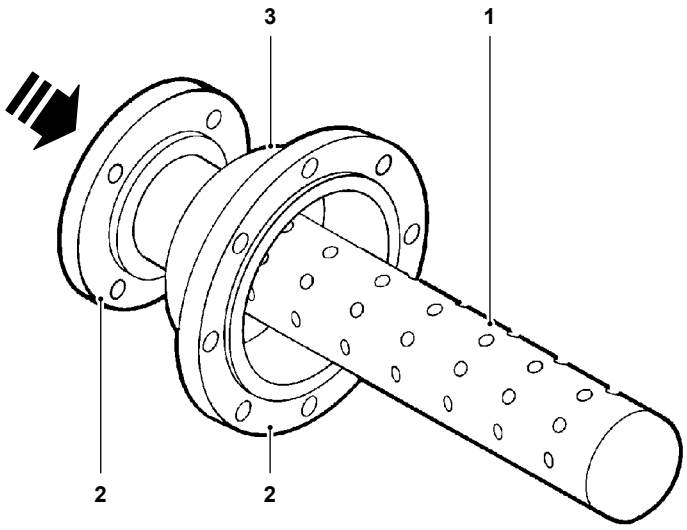
Noise Diffuser
D Series

Description

The D Series Noise Diffuser is designed to reduce Pressure Reducing Valve noise generation. The diffuser breaks up the normal exit turbulance of the steam flow using an engineered orifice pattern in a pipe nozzle inserted on the downstream side of a pressure reducing valve.

The amount of noise level reduction produced by the diffuser can be approximately 10-15 dBa depending on frequency. Pressure drop through the diffuser will not exceed 1% of line pressure upstream of the pressure reducing valve.

Model	D-1 to D-24
PMO	320 psi g
Sizes	½"x 2" to 6"x20" (see overleaf)
Connections	Male NPT/ANSI Flgd. (see overleaf)
Construction	Carbon Steel Body
Options	Buttweld outlet connection



Materials

No.	Part	Material	
			ASTM A106 GrB
1	Pipe	Steel	ASTM A-53-GrB
			ASTM A516 Gr70
2	Flanges	Steel	ASTM A105
3	Head	Steel	ASTM A-516 Gr70

Limiting operating conditions

PMO	Maximum operating pressure	320 psi g (22 bar g)
TMO	Maximum operating temperature	600 °F (316 °C) at all operating pressures

Sample specification

An in-line noise diffuser shall be installed directly attached to the downstream connection of a pressure reducing valve to reduce noise output by up to 10-15 dBa based on frequency when measured by a sound level meter meeting ANSI standards. Noise Diffuser shall be manufactured of rolled and welded steel components that have been welded in accordance with ASME Section IX weld procedures. Pressure drop through the diffuser shall not exceed 1% of line pressure upstream of the pressure reducing valve. No additional pipe expansion shall be necessary downstream of the diffuser.

Installation

The Noise Diffuser inlet should be directly attached to the outlet of the Pressure Reducing Valve. This type of installation is recommended to avoid the generation of flanking noise normally found when separately installing the Pressure Reducing Valve and Diffuser with a section of pipe between them.

Table 1: Acoustic Diffusers

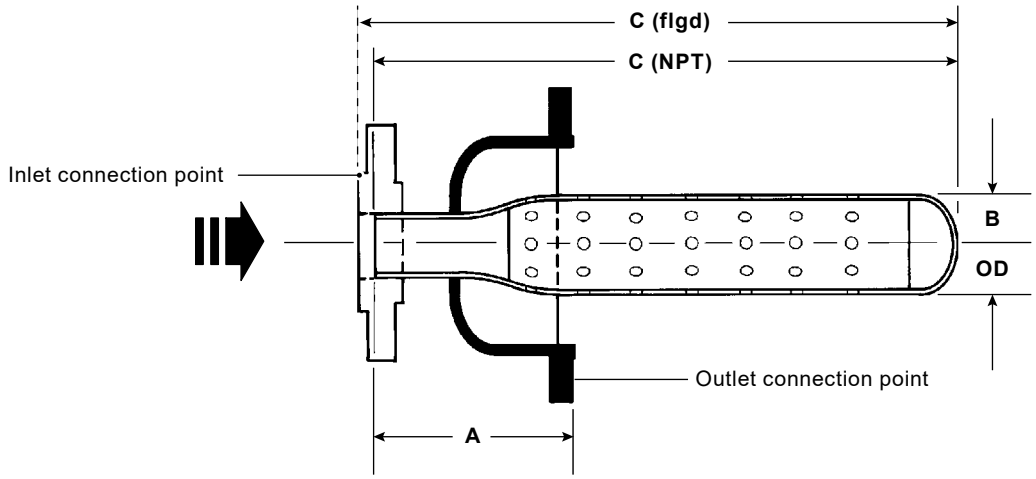
Frequency (Hz)	63	125	250	500	1K	2K	4K	8K
DIL (ΔdBa)	-2	-3	-6	-10	-13	-15	-12	-8

Capacities – Pounds of Saturated Steam per Hour

Inlet steam Pressure to PRV psi g	Model No												
	D1	D3	D4	D5	D6	D8	D10	D12	D14	D16	D18	D20	D24
15	1000	1500	3000	4000	6000	10,000							
20	1000	1500	3000	4000	6000	12,000	15,000						
25	1000	1500	3000	4000	6000	12,000	16,500						
30	1000	1500	3000	4000	6000	12,000	18,000						
40	1000	1500	3000	4000	6000	12,000	18,000						
50	1000	1500	2000	4000	6000	12,000	18,000	25,000					
60	1000	1500	2000	4000	6000	12,000	18,000	25,000	35,000				
75	1000	1500	2000	4000	6000	12,000	18,000	25,000	35,000	40,000	50,000		
85	1000	1500	2000	4000	6000	12,000	16,800	25,000	35,000	40,000	50,000		
100	1000	1500	2000	4000	6000	12,000	15,000	25,000	35,000	40,000	50,000		
125	1000	1500	2000	4000	6000	10,000	15,000	25,000	35,000	40,000	50,000		
150	1000	1500	2000	4000	6000	10,000	15,000	25,000	35,000	40,000	50,000	75,000	
175	1000	1500	2000	4000	6000	10,000	15,000	25,000	35,000	40,000	50,000	75,000	
200	1000	1500	2000	4000	6000	10,000	15,000	25,000	35,000	40,000	50,000	75,000	100,000
225	1000	1500	2000	4000	6000	10,000	15,000	25,000	35,000	40,000	50,000	75,000	100,000
250	1000	1500	2000	4000	6000	10,000	15,000	25,000	35,000	40,000	50,000	75,000	103,000
275	1000	1500	2000	4000	6000	10,000	15,000	25,000	35,000	40,000	50,000		
300	1000	1650	2000	5000	6600	10,000	16,500	27,000	35,000	40,000	55,000		

Diffuser capacity depends on the inlet steam pressure to the PRV. Choose a diffuser with a capacity equal to or greater than that of the PRV, and check to confirm that the connections are compatible. If not, select the next diffuser that offers the same inlet connection as the PRV outlet.

Dimensions nominal in inches



Model	Inlet [1]	Outlet [2]	A	B	C	Maximum Weight [3] NPT/150# 150#/150#	Maximum Weight [3] NPT/300# 300#/300#	Model
D1	½ to 1	2	5.5	1.32	10.5	6.8	8.8	D1
D3					13.5	7.1	9.1	D3
D4	¾ to 2	4	6.5	2.38		18.6	27.6	D4
D5	¾ to 2½			2.88	16.5	25.8	34.8	D5
D6	1¼ to 3	6	8	3.5	17	39	64	D6
D8	1½ to 4	8	10	4.5	17	72.9	109.9	D8
D10	2 to 6				21	131.2	202.2	D10
D12	2½ to 6	12	12	6.625	21	131.6	202.6	D12
D14	3 to 6				28	132.6	203.6	D14
D16	4 and 6	16		8.625	24	196.2	308.2	D16
D18					31	196.4	308.4	D18
D20	6	20		10.75	26	297.1	467.1	D20
D24					32	298.4	468.4	D24

[1] Available inlet sizes: Male NPT – ½", ¾", 1", 1¼", 1½", 2" ; ANSI 150 or 300 flanged - 2-½", 3", 4", 6".

[2] All outlets are ANSI 150 or 300 flanged.

[3] The weight shown is for the largest inlet size. If precise weights are required, please contact the factory.

SAFETY VALVE SOLUTIONS



Section contents ⟩

spirax sarco

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SECTION 4 CONTENTS

SV47H Iron Safety and Relief Valve	TI-P709-01-EN
SV44H Steel Safety and Relief Valve	TI-P710-01-EN
Drip Pan Elbow	TI-P277-01-US
SV5601 & SV5708 Series Bronze Safety Valves ASME Section I & VIII - NB Certified for Air, Gas and Steam	TI-P272-01-US
SV418 Series Bronze Safety Valves ASME Section VIII - NB Certified for Air, Gas, Steam, and Liquid	TI-P273-01-US
SV69L Bronze Liquid Relief Valves - Non-ASME Coded	TI-P277-02-US

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TI-P709-01
CTLS Issue 1

SV47H
SG Iron
Safety Valve

Description
SV47H Safety Valves are high-capacity valves with standard orifices from J to R. They have a modern design with two adjusting rings, allowing precise blowdown adjustment. Designed for use in boilers, organic fluid vaporizers and pressure vessels.

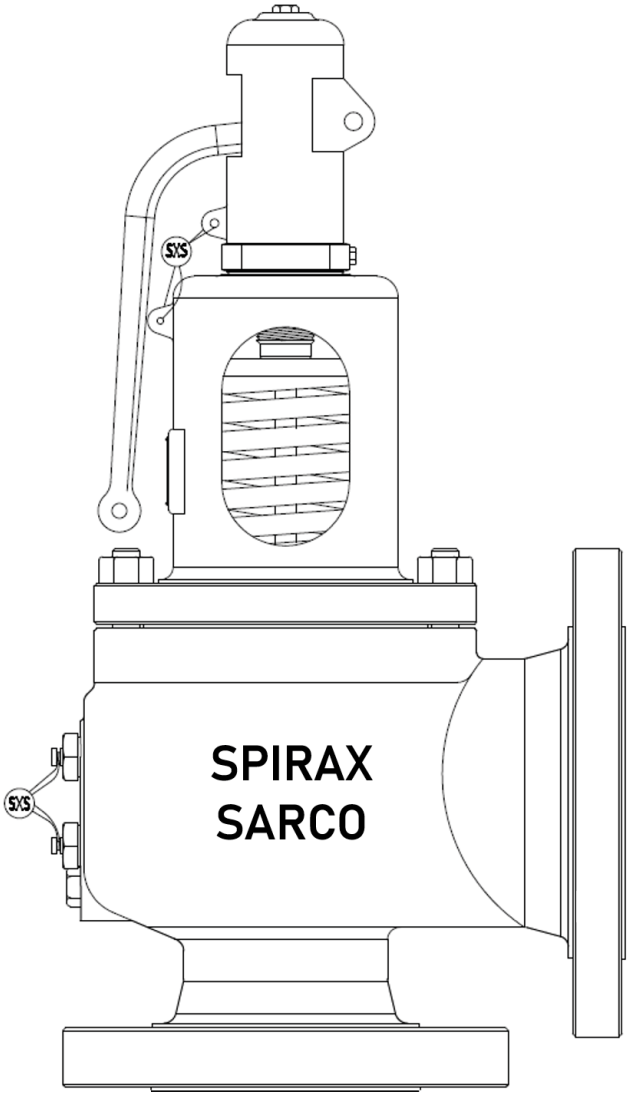
Available types
SV47H Safety Valves have flanged inlet connections in accordance with ASME B16.42 and a test lever. For orifices J, K, and L there is the option of threaded outlet connections (NPT) in accordance with ANSI Standard B1.20.1. The materials of construction are selected to meet the temperature and pressure characteristics of the process fluid.

Applications
Effective overpressure protection for boilers and generators, for steam systems downstream of pressure regulating stations, at the inlet of equipment such as heat exchangers and process vessels. Also for use in steam flash recovery tanks and in condensate return systems to protect accumulation vessels and equipment.

Construction standard
SV47H Safety Valves are designed and built in accordance with the ASME Sec.I, Sec.XIII and Sec.VIII and the materials of construction meet the requirements of these codes. Production tests are carried out in accordance with the requirements of items PG-73.5, 3.6 and UG-136(d) of these codes.

Certificates
A certificate of conformity is supplied with each valve including valve set pressure and hydrostatic test. Material certification is provided in accordance with BS-EN 10204 3.1 for all primary pressure containing parts.

Installation and maintenance
Consult the latest revision of the IM-S41-04 Installation and Maintenance Manual.



Operating limits

Pressure

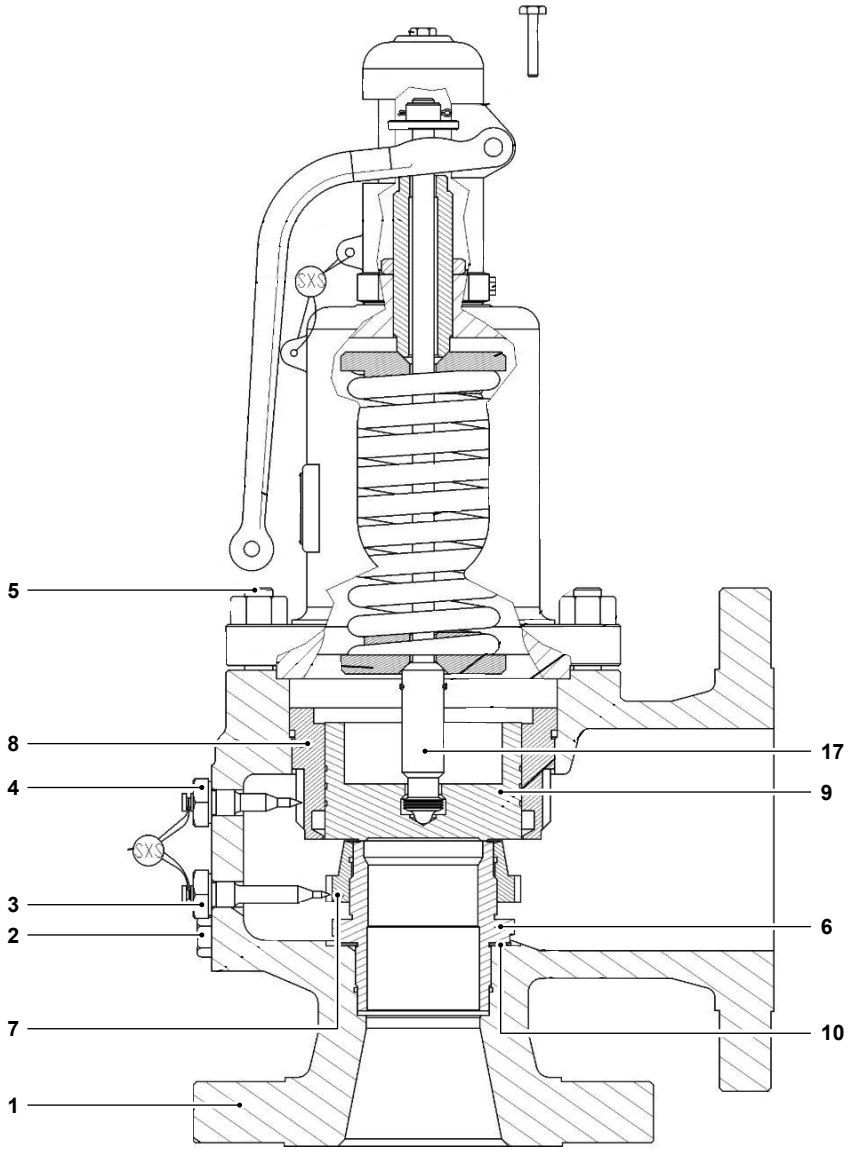
Set Pressure	Maximum	20.7 bar g / 300 psi g
	Minimum	1 bar g / 15 psi g
Maximum back pressure		2.1 bar g / 30 psi g
Hydrostatic test pressure		1.5 x design pressure

Temperature

Body material	Specification	
SG Iron	SA-395 Gr. 60-40-18	Minimum -29 °C / 20 °F Maximum 343 °C / 650 °F

Temperature limits based on ASME B16.42

Materials

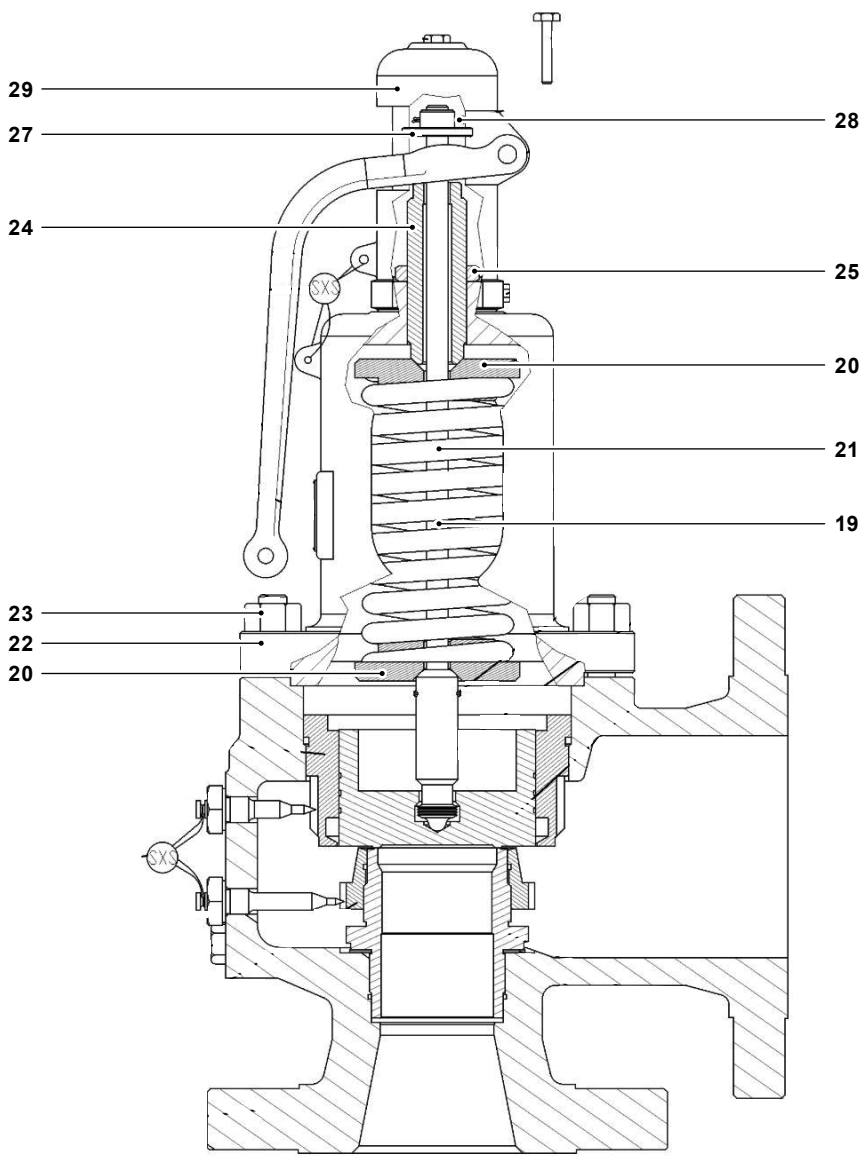


No.	Part	Material
1	Body	SA 395 Gr. 60-40-18
2	Drain Plug	Carbon Steel
3	Lock Screw - Lower	Stainless Steel
4	Lock Screw - Upper	Stainless Steel
5	Body Stud	SA 193 Gr. B7
6	Seat Gasket	Graphite
7	Adjusting Ring - Lower	316 St. St.
8	Adjusting Ring - Upper	316 St. St.
9	Disc	Hardened St. St. (17-4-PH)
10	Seat	316 St. St.
17	Stem Retainer	Hardened St. St. (17-4-PH)

Other materials under request

Materials continued on next page

Materials (continued)

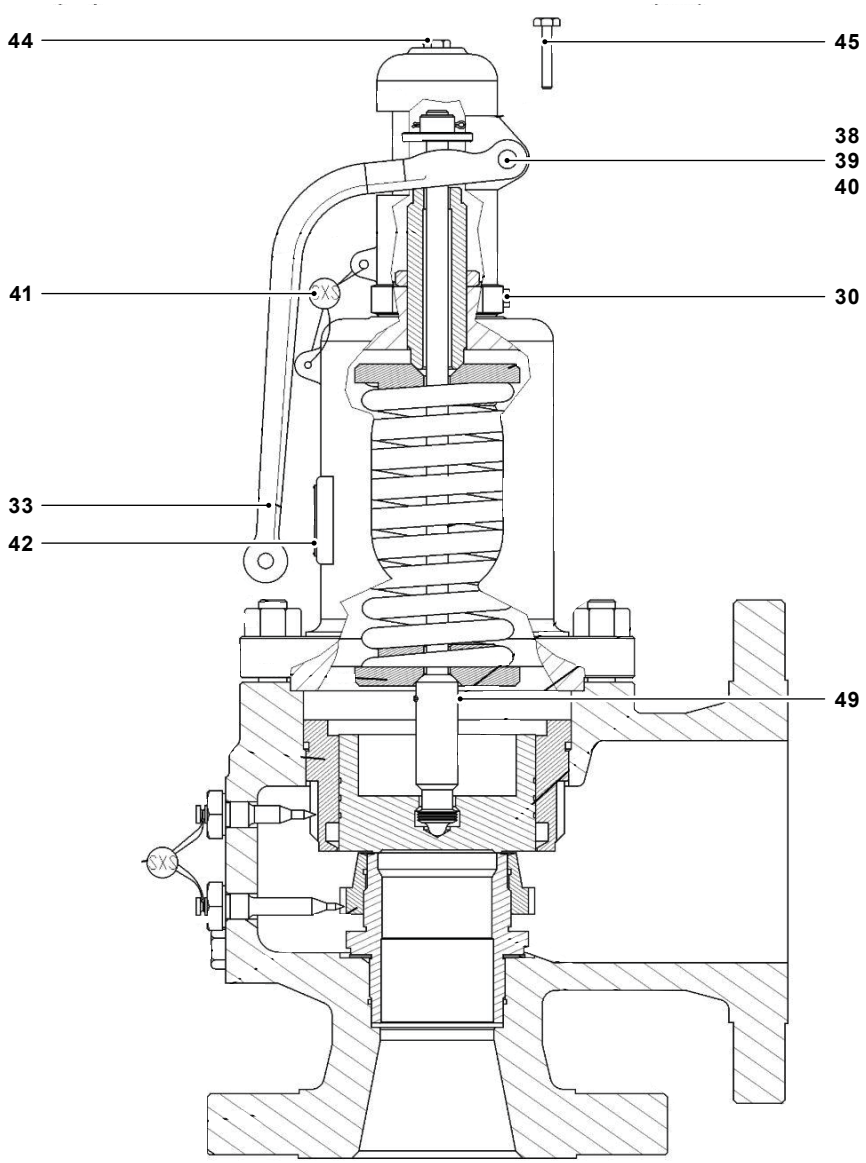


No.	Part		Material
19	Stem		304 St. St.
20	Spring Washer		Carbon Steel
21	Spring	up to 232°C / 450°F	Carbon Steel
		233°C to 343°C / 451°F to 650°F	High Temperature Alloy Steel
22	Bonnet		SA 395 Gr. 60-40-18
23	Hex Nut (Body)		SA 194 Gr. 2H
24	Spring Adjusting Screw		304 St. St.
25	Adjusting Screw Locknut		304 St. St.
27	Stem Test Nut		Carbon Steel
28	Cotter Pin		Carbon Steel
29	Cap		Cast Iron

Other materials under request

Materials continued on next page

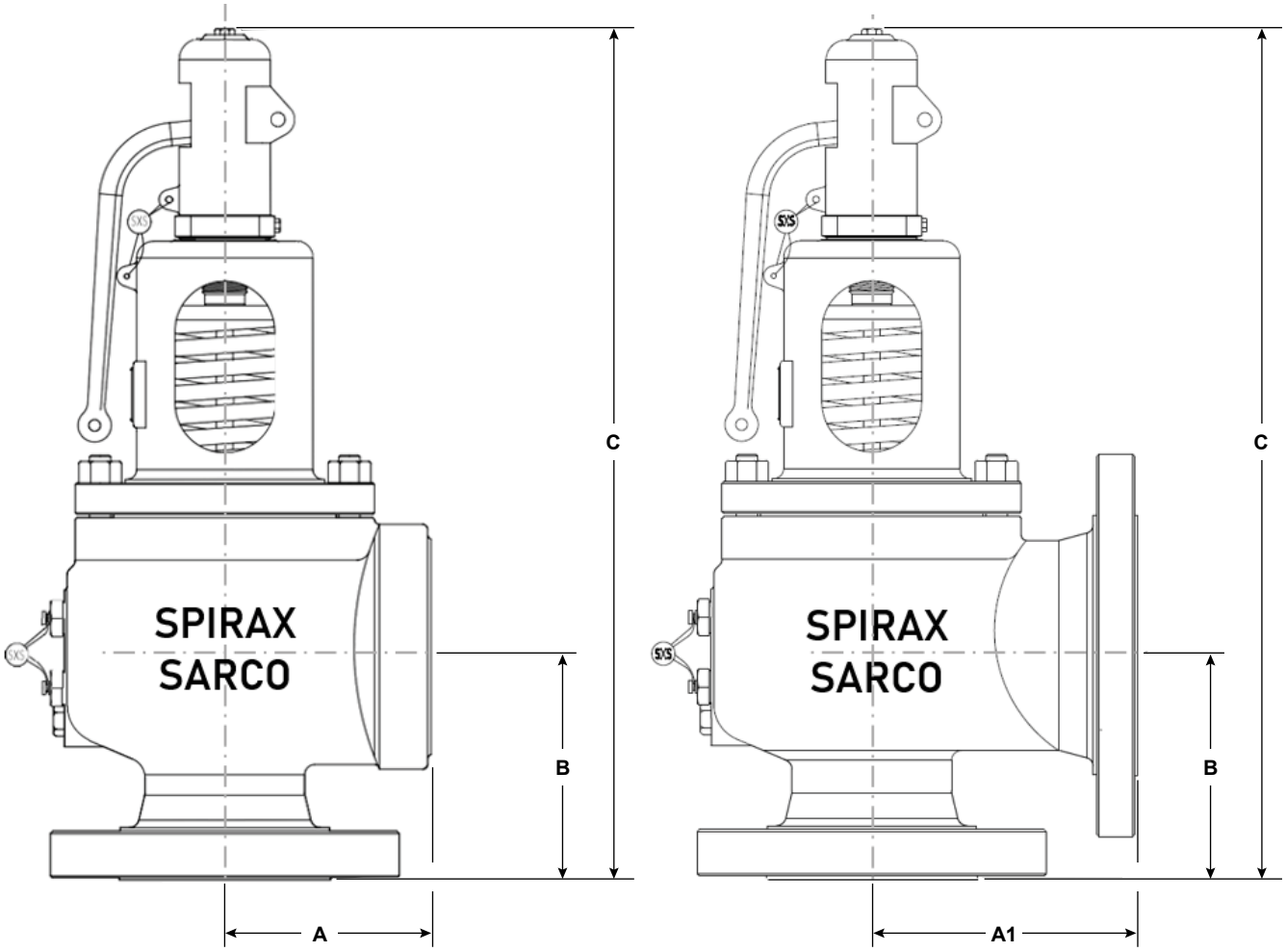
Materials (continued)



No.	Part	Material
30	Cap Screw	Carbon Steel
33	Test Lever	Cast Iron
38	Pin washer	Carbon Steel
39	Lever Pin	Carbon Steel
40	Cotter Pin	Carbon Steel
41	Seal	Lead
42	Nameplate	316 St. St.
44	Cap Plug	Carbon Steel
45	Test Gag	Carbon Steel
49	Stem Pin	Carbon Steel

Other materials under request

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Orifice	Size		Ratings		A		A1		B		C		Weight	
	Inlet	Outlet			mm	in	mm	in	mm	in	mm	in	kg	lb
J	1½"	2½"	300#	NPT	89	3.50			108	4.25	413	16.26	17	8
	2												18	8
K	2"	3"			102	4.02			117	4.61	466	18.35	22	10
	2½"												23	10
L		4"			124	4.88			140	5.51	507	19.96	32	15
	3"						160	6.30	140	5.51	507	19.96	37	17
M	3"			150#			165	6.50	143	5.63	607	23.90	50	23
N	4"	6"					184	7.25	172	6.77	670	26.38	85	39
P							210	8.27	172	6.77	727	28.62	94	43
Q	6"	8"					238	9.37	235	9.25	889	35.0	161	73
R							254	10.0	276	10.87	1025	40.35	287	130

Capacity Table - Steam - 3% Overpressure - kg/h

Set pressure (bar g)	Orifice Designation / Current Area (cm²)							
	J	K	L	M	N	P	Q	R
	8.867	**12.69**	**19.71**	**24.81**	**29.90**	**44.06**	**76.20**	**110.47**
1.0	857	1226	1904	2397	2888	4256	7361	10671
1.5	1055	1511	2346	2953	3559	5245	9070	13150
2.0	1254	1795	2788	3510	4230	6233	10780	15628
2.5	1453	2080	3231	4066	4901	7222	12489	18106
3.0	1652	2365	3673	4623	5571	8210	14199	20585
3.5	1851	2649	4115	5180	6242	9198	15908	23063
4.0	2050	2934	4557	5736	6913	10187	17618	25541
4.5	2249	3219	4999	6293	7584	11175	19327	28019
5.0	2452	3509	5450	6860	8268	12183	21071	30547
5.5	2657	3802	5906	7434	8959	13202	22832	33100
6.0	2862	4095	6361	8007	9650	14220	24592	35652
6.5	3067	4389	6817	8580	10341	15238	26353	38205
7.0	3271	4682	7272	9154	11032	16256	28114	40758
7.5	3476	4975	7727	9727	11722	17274	29875	43310
8.0	3681	5268	8183	10300	12413	18292	31635	45863
8.5	3886	5562	8638	10873	13104	19310	33396	48416
9.0	4091	5855	9094	11447	13795	20328	35157	50968
9.5	4296	6148	9549	12020	14486	21346	36918	53521
10	4501	6441	10005	12593	15177	22364	38678	56073
12	5320	7614	11826	14886	17941	26437	45721	66284
14	6140	8787	13648	17180	20704	30509	52764	76494
16	6959	9960	15470	19473	23468	34581	59807	86705
18	7779	11133	17292	21766	26231	38654	66850	96915
20	8599	12306	19113	24059	28995	42726	73893	107126
20.7	8885	12716	19751	24862	29962	44152	76358	110699

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - Steam - 3% Overpressure – lb/h

Set pressure (bar g)	Orifice Designation / Current Area (in²)							
	J	K	L	M	N	P	Q	R
	1.375	1.968	3.054	3.846	4.634	6.830	11.812	17.121
15	1915	2741	4253	5356	6453	9511	16449	23842
20	2217	3173	4924	6201	7471	11011	19043	27603
25	2519	3605	5595	7045	8489	12512	21638	31363
30	2821	4037	6265	7890	9507	14012	24232	35124
35	3123	4470	6936	8735	10525	15512	26827	38884
40	3425	4902	7607	9580	11542	17012	29421	42645
50	4029	5766	8949	11269	13578	20013	34610	50166
60	4633	6631	10290	12959	15614	23013	39799	57687
70	5243	7504	11645	14665	17670	26043	45040	65284
80	5865	8395	13027	16405	19767	29134	50385	73031
90	6487	9285	14409	18146	21863	32224	55729	80777
100	7109	10176	15791	19886	23960	35315	61074	88524
110	7732	11066	17173	21626	26057	38405	66419	96271
120	8354	11956	18554	23366	28154	41495	71763	104018
130	8976	12847	19936	25106	30250	44586	77108	111765
140	9598	13737	21318	26847	32347	47676	82452	119511
150	10220	14628	22700	28587	34444	50767	87797	127258
160	10842	15518	24082	30327	36541	53857	93142	135005
180	12087	17299	26846	33807	40734	60038	103831	150499
190	12709	18190	28227	35548	42831	63128	109176	158245
200	13331	19080	29609	37288	44928	66218	114520	165992
230	15197	21752	33755	42509	51218	75490	130554	189233
260	17064	24423	37900	47729	57508	84761	146588	212473
270	17686	25314	39282	49469	59605	87851	151933	220220
300	19552	27985	43428	54690	65895	97122	167966	243460

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - Steam - 10% Overpressure - kg/h

Set pressure (bar g)	Orifice Designation / Current Area (cm²)							
	J	K	L	M	N	P	Q	R
	8.867	12.69	19.71	24.81	29.90	44.06	76.20	110.47
1.0	883	1264	1963	2471	2978	4389	7590	11004
1.5	1082	1549	2405	3028	3649	5377	9299	13482
2.0	1281	1833	2848	3584	4320	6366	11009	15960
2.5	1497	2143	3328	4189	5048	7439	12865	18651
3.0	1716	2456	3814	4801	5786	8526	14746	21378
3.5	1935	2769	4301	5413	6524	9614	16626	24104
4.0	2154	3082	4787	6026	7262	10701	18507	26830
4.5	2372	3395	5273	6638	8000	11788	20387	29556
5.0	2591	3708	5760	7250	8737	12875	22267	32282
5.5	2810	4021	6246	7862	9475	13963	24148	35008
6.0	3029	4335	6733	8475	10213	15050	26028	37734
6.5	3248	4648	7219	9087	10951	16137	27909	40460
7.0	3466	4961	7705	9699	11689	17225	29789	43186
7.5	3685	5274	8192	10311	12427	18312	31670	45912
8.0	3904	5587	8678	10924	13165	19399	33550	48639
8.5	4123	5900	9164	11536	13902	20486	35430	51365
9.0	4342	6214	9651	12148	14640	21574	37311	54091
9.5	4560	6527	10137	12760	15378	22661	39191	56817
10	4779	6840	10624	13373	16116	23748	41072	59543
12	5655	8092	12569	15821	19067	28097	48593	70447
14	6530	9345	14515	18270	22019	32446	56115	81352
16	7405	10598	16460	20719	24970	36796	63636	92256
18	8280	11850	18406	23168	27922	41145	71158	103161
20	9156	13103	20351	25617	30873	45494	78680	114065
20.7	9462	13541	21032	26475	31906	47016	81312	117882

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - Steam - 10% Overpressure - lb/h

Set pressure (bar g)	Orifice Designation / Current Area (in²)							
	J	K	L	M	N	P	Q	R
	1.375	1.968	3.054	3.846	4.634	6.830	11.812	17.121
15	1975	2827	4387	5525	6657	9811	16968	24594
20	2277	3259	5058	6370	7675	11311	19562	28355
25	2579	3692	5729	7214	8692	12812	22157	32115
30	2881	4124	6399	8059	9710	14312	24751	35876
35	3213	4599	7137	8988	10830	15962	27605	40013
40	3546	5075	7875	9918	11950	17612	30459	44149
50	4210	6026	9351	11776	14189	20913	36167	52423
60	4875	6977	10827	13634	16428	24213	41875	60696
70	5539	7928	12303	15493	18667	27514	47583	68969
80	6203	8879	13778	17351	20907	30814	53291	77242
90	6868	9830	15254	19210	23146	34114	58998	85516
100	7532	10781	16730	21068	25385	37415	64706	93789
110	8197	11732	18206	22927	27624	40715	70414	102062
120	8861	12683	19681	24785	29864	44016	76122	110336
130	9526	13634	21157	26644	32103	47316	81830	118609
140	10190	14585	22633	28502	34342	50616	87538	126882
150	10854	15536	24109	30361	36581	53917	93245	135155
160	11519	16487	25584	32219	38821	57217	98953	143429
180	12848	18389	28536	35936	43299	63818	110369	159975
190	13512	19340	30012	37795	45538	67119	116077	168249
200	14177	20291	31488	39653	47778	70419	121785	176522
230	16170	23144	35915	45229	54496	80320	138908	201342
260	18163	25996	40342	50804	61213	90222	156032	226162
270	18828	26947	41818	52663	63453	93522	161740	234435
300	20821	29800	46245	58238	70170	103423	178863	259255

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity table - AIR - 10% Overpressure - Nm3/h (0°C and 1.013 bar)

Set pressure (bar g)	Orifice Designation / Current Area (cm²)							
	J	K	L	M	N	P	Q	R
	8.867	**12.69**	**19.71**	**24.81**	**29.90**	**44.06**	**76.20**	**110.47**
1.0	1149	1644	2553	3214	3873	5708	9871	14311
1.5	1407	2014	3128	3938	4746	6993	12095	17534
2.0	1666	2384	3703	4662	5618	8279	14318	20757
2.5	1947	2787	4328	5448	6566	9675	16732	24258
3.0	2232	3194	4961	6244	7525	11089	19178	27803
3.5	2516	3601	5593	7040	8485	12503	21624	31349
4.0	2801	4008	6226	7837	9444	13917	24069	34894
4.5	3085	4416	6858	8633	10404	15331	26515	38440
5.0	3370	4823	7491	9429	11364	16745	28960	41985
5.5	3655	5230	8124	10226	12323	18159	31406	45530
6.0	3939	5637	8756	11022	13283	19574	33852	49076
6.5	4224	6045	9389	11818	14243	20988	36297	52621
7.0	4508	6452	10021	12614	15202	22402	38743	56167
7.5	4793	6859	10654	13411	16162	23816	41188	59712
8.0	5077	7267	11286	14207	17121	25230	43634	63258
8.5	5362	7674	11919	15003	18081	26644	46080	66803
9.0	5647	8081	12552	15799	19041	28058	48525	70349
9.5	5931	8488	13184	16596	20000	29472	50971	73894
10	6216	8896	13817	17392	20960	30886	53416	77440
12	7354	10525	16347	20577	24799	36543	63199	91622
14	8492	12154	18877	23762	28637	42199	72981	105804
16	9631	13783	21408	26947	32476	47855	82764	119986
18	10769	15412	23938	30132	36314	53512	92546	134168
20	11907	17041	26468	33317	40153	59168	102329	148350
20.7	12306	17612	27354	34432	41496	61148	105752	153313

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - AIR - 10% Overpressure - SCFM (60ºF and 14.7 psi)

Set pressure (bar g)	Orifice Designation / Current Area (in²)							
	J	K	L	M	N	P	Q	R
	1.375	1.968	3.054	3.846	4.634	6.830	11.812	17.121
15	703	1007	1562	1967	2371	3494	6043	8758
20	811	1161	1801	2268	2733	4028	6966	10098
25	918	1315	2040	2569	3096	4562	7890	11437
30	1026	1469	2279	2870	3458	5097	8814	12776
35	1144	1638	2542	3201	3857	5684	9831	14249
40	1263	1807	2805	3532	4255	6272	10847	15722
50	1499	2146	3330	4194	5053	7447	12880	18669
60	1736	2485	3856	4855	5850	8623	14912	21615
70	1973	2823	4381	5517	6648	9798	16945	24561
80	2209	3162	4907	6179	7445	10973	18978	27507
90	2446	3501	5432	6841	8243	12149	21010	30454
100	2682	3839	5958	7503	9040	13324	23043	33400
110	2919	4178	6483	8165	9837	14499	25076	36346
120	3156	4517	7009	8826	10635	15675	27108	39292
130	3392	4855	7534	9488	11432	16850	29141	42239
140	3629	5194	8060	10150	12230	18025	31174	45185
150	3865	5533	8585	10812	13027	19201	33206	48131
160	4102	5871	9111	11474	13825	20376	35239	51077
180	4575	6548	10162	12797	15420	22727	39304	56970
190	4812	6887	10688	13459	16217	23902	41337	59916
200	5049	7226	11213	14121	17014	25077	43370	62862
230	5758	8242	12790	16107	19407	28603	49468	71701
260	6468	9258	14366	18092	21799	32129	55566	80540
270	6705	9596	14892	18754	22597	33305	57598	83486
300	7415	10612	16469	20740	24989	36831	63696	92325

For sizing using current areas (ASME), the discharge coefficient K for air, gases and vapours is 0.853

Correction Factor (Ks) for Superheated Steam

Set Pressure		Saturated Steam Temperature		Temperature											
				°C											
bar g	psi g	°C	°F	160	170	180	190	200	210	230	240	250	260	270	280
				°F											
				320	340	360	380	400	420	440	460	480	500	520	540
1.0	15	122	250	1.00	0.99	0.99	0.98	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
1.5	20	128	259	1.00	0.99	0.99	0.98	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
2.0	30	134	274	1.00	0.99	0.99	0.98	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
3.0	45	144	292	1.00	0.99	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
4.0	60	152	308	1.00	1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
5.0	70	160	316		1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
5.5	80	162	324		1.00	1.00	0.99	0.98	0.98	0.97	0.96	0.94	0.93	0.92	0.91
7.0	100	171	338			1.00	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92
8.5	120	178	350				1.00	1.00	0.99	0.98	0.96	0.95	0.94	0.93	0.92
9.5	140	182	361					1.00	0.99	0.98	0.96	0.95	0.94	0.93	0.92
12	175	192	378					1.00	0.99	0.98	0.97	0.95	0.94	0.93	0.92
14	205	198	390					1.00	0.99	0.99	0.97	0.96	0.95	0.93	0.92
16	230	205	400					1.00	0.99	0.99	0.98	0.97	0.95	0.94	0.93
18	260	210	410						1.00	0.99	0.98	0.97	0.96	0.94	0.93
21	305	217	423							1.00	1.00	0.99	0.97	0.95	0.94

Correction Factor (Ks) for Superheated Steam table continued on next page

Correction Factor (Ks) for Superheated Steam (continued)

Set Pressure		Saturated Steam Temperature		Temperature										
				°C										
bar g	psi g	°C	°F	290	300	320	330	340	350	360	370	380	390	400
				°F										
				560	580	600	620	640	660	680	700	720	740	750
1.0	15	122	250	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.83	0.82
1.5	20	128	259	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.83	0.82
2.0	30	134	274	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.84	0.83	0.82
3.0	45	144	292	0.90	0.89	0.88	0.87	0.87	0.86	0.85	0.84	0.84	0.83	0.82
4.0	60	152	308	0.90	0.89	0.88	0.87	0.87	0.86	0.85	0.84	0.84	0.83	0.82
5.0	70	160	316	0.90	0.89	0.88	0.87	0.87	0.86	0.85	0.84	0.84	0.83	0.82
5.5	80	162	324	0.90	0.89	0.89	0.88	0.87	0.86	0.85	0.84	0.84	0.83	0.82
7.0	100	171	338	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83	0.82
8.5	120	178	350	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83	0.82
9.5	140	182	361	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83	0.82
12	175	192	378	0.91	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82
14	205	198	390	0.91	0.91	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.84	0.83
16	230	205	400	0.92	0.91	0.90	0.89	0.87	0.87	0.86	0.85	0.84	0.84	0.83
18	260	210	410	0.92	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83
21	305	217	423	0.93	0.91	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83

For superheated steam capacity, multiply saturated steam capacity by the correction factor (Ks).

How to order

The following information is required for the correct sizing and selection of SV47H Safety Valves:

1) Fluid
2) Required Capacity (Flow)
3) Operating Pressure and Set Pressure
4) Operating Temperature and Relieving Temperature
5) Back pressure
6) Overpressure
7) Molecular Weight (Gases)

Spirax Sarco provides on its website the PSV Calc software for the calculation, sizing, and selection of Safety and Relief Valves.

TI-P710-01
CTLS Issue 1

SV44H
Carbon Steel Safety Valve

Description
SV44H Safety Valves are high-capacity valves with standard orifices from F to R. They have a modern design with two adjusting rings, allowing precise blowdown adjustment. Designed for use in boilers, organic fluid vaporizers and pressure vessels.

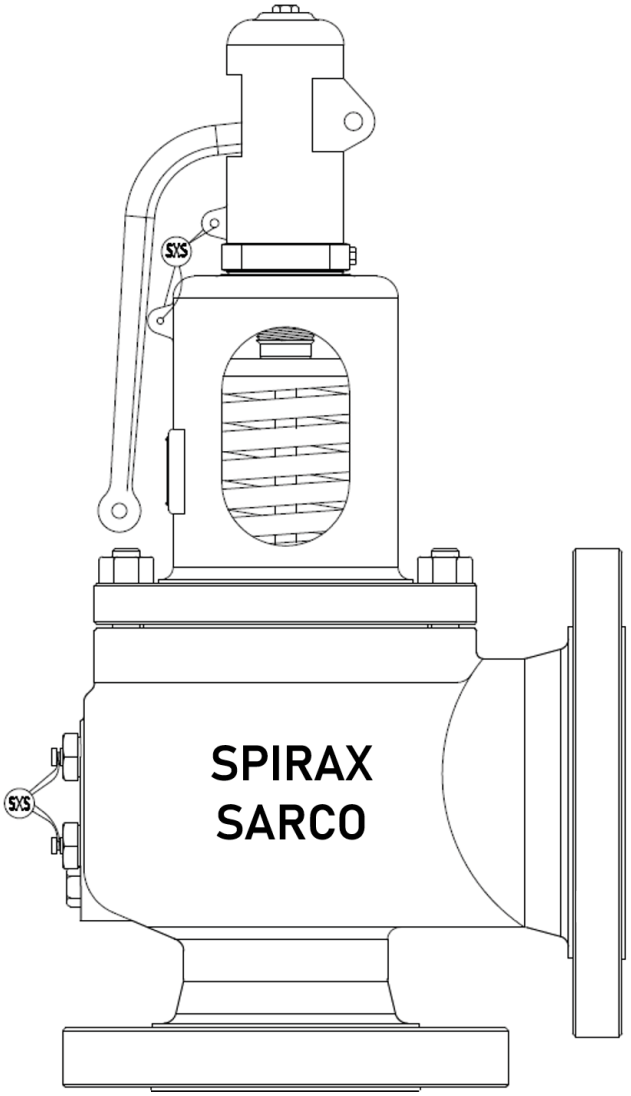
Available types
SV44H Safety Valves have flanged inlet connections in accordance with ASME B16.5 and a test lever.
The materials of construction are selected to meet the temperature and pressure characteristics of the process fluid.

Applications
Effective overpressure protection for boilers and generators, for steam systems downstream of pressure regulating stations, at the inlet of equipment such as heat exchangers and process vessels. Also for use in steam flash recovery tanks and in condensate return systems to protect accumulation vessels and equipment.

Construction standard
SV44H Safety Valves are designed and built in accordance with the ASME Sec.I, Sec.XIII and Sec.VIII and the materials of construction meet the requirements of these codes. Production tests are carried out in accordance with the requirements of items PG-73.5, 3.6 and UG-136(d) of these codes.

Certificates
A certificate of conformity is supplied with each valve including valve set pressure and hydrostatic test. Material certification is provided in accordance with BS-EN 10204 3.1 for all primary pressure containing parts.

Installation and maintenance
Consult the latest revision of the IM-S41-04 Installation and Maintenance Manual



Operating limits

Pressure

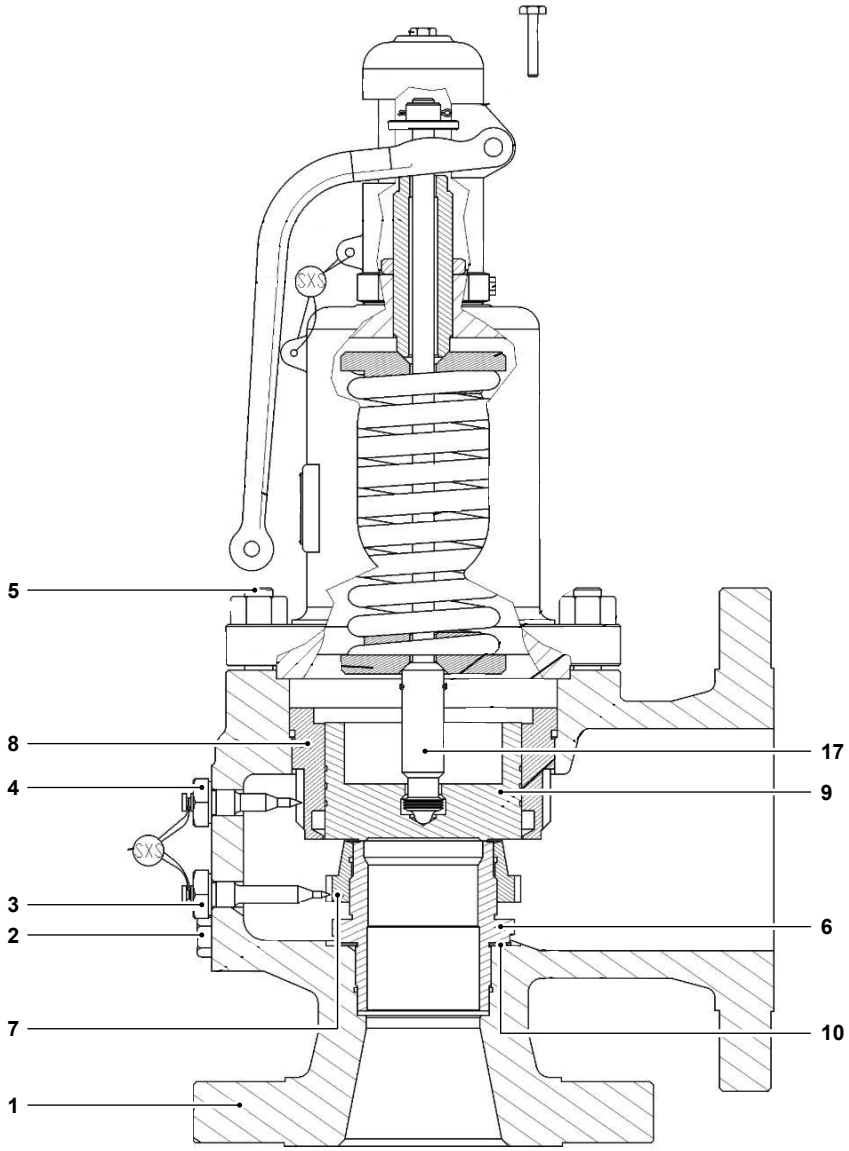
Set Pressure	Maximum	20.7 bar g / 300 psi g
	Minimum	1 bar g / 15 psi g
Maximum back pressure		2.1 bar g / 30 psi g
Hydrostatic test pressure		1.5 x design pressure

Temperature

Body material	Specification	
Carbon Steel	SA-216 Gr. WCB	Minimum -29 °C / 20 °F Maximum 400 °C / 752 °F

Temperature limits based on ASME B16.42 and ASME B16.5

Materials

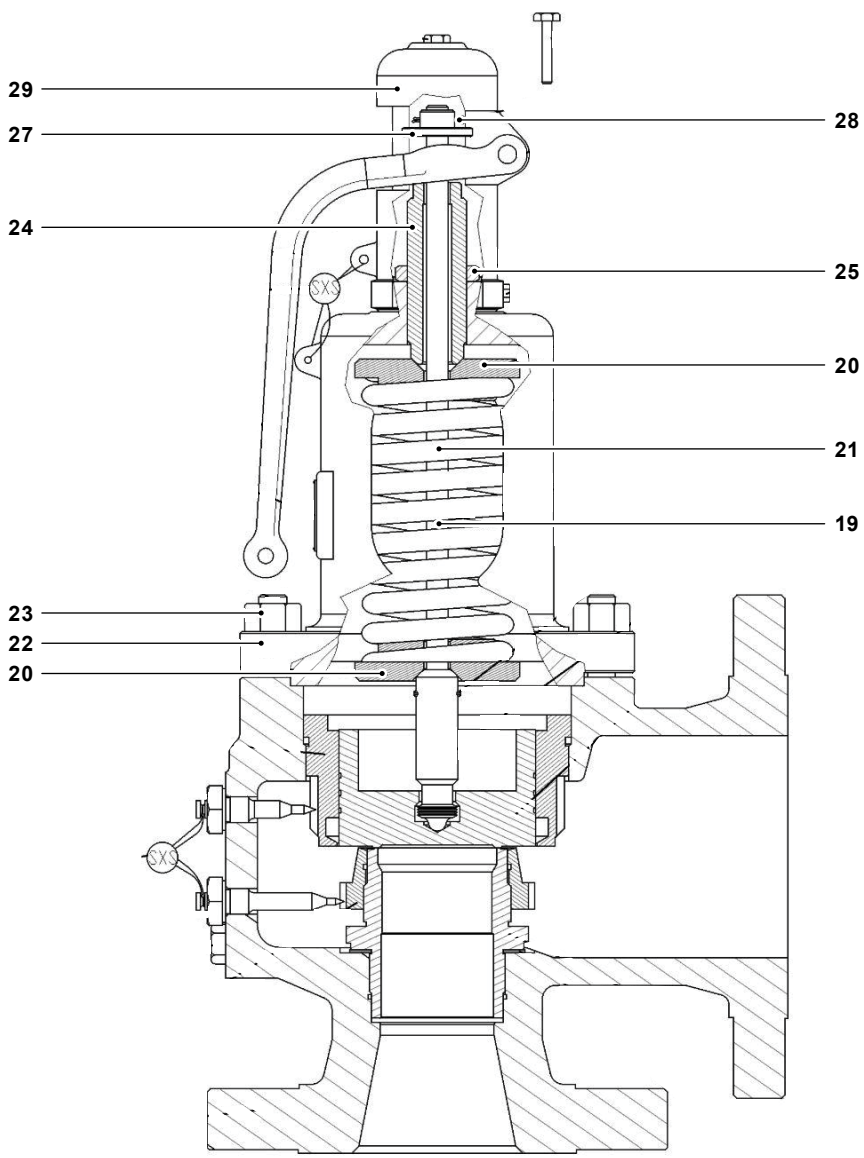


No.	Part	Material
1	Body	SA 216 Gr. WCB
2	Drain Plug	Carbon Steel
3	Lock Screw - Lower	Stainless Steel
4	Lock Screw - Upper	Stainless Steel
5	Body Stud	SA 193 Gr. B7
6	Seat Gasket	Graphite
7	Adjusting Ring - Lower	316 St. St.
8	Adjusting Ring - Upper	316 St. St.
9	Disc	Hardened St. St. (17-4-PH)
10	Seat	316 St. St.
17	Stem Retainer	Hardened St. St. (17-4-PH)

Other materials under request

Materials continued on next page

Materials (continued)

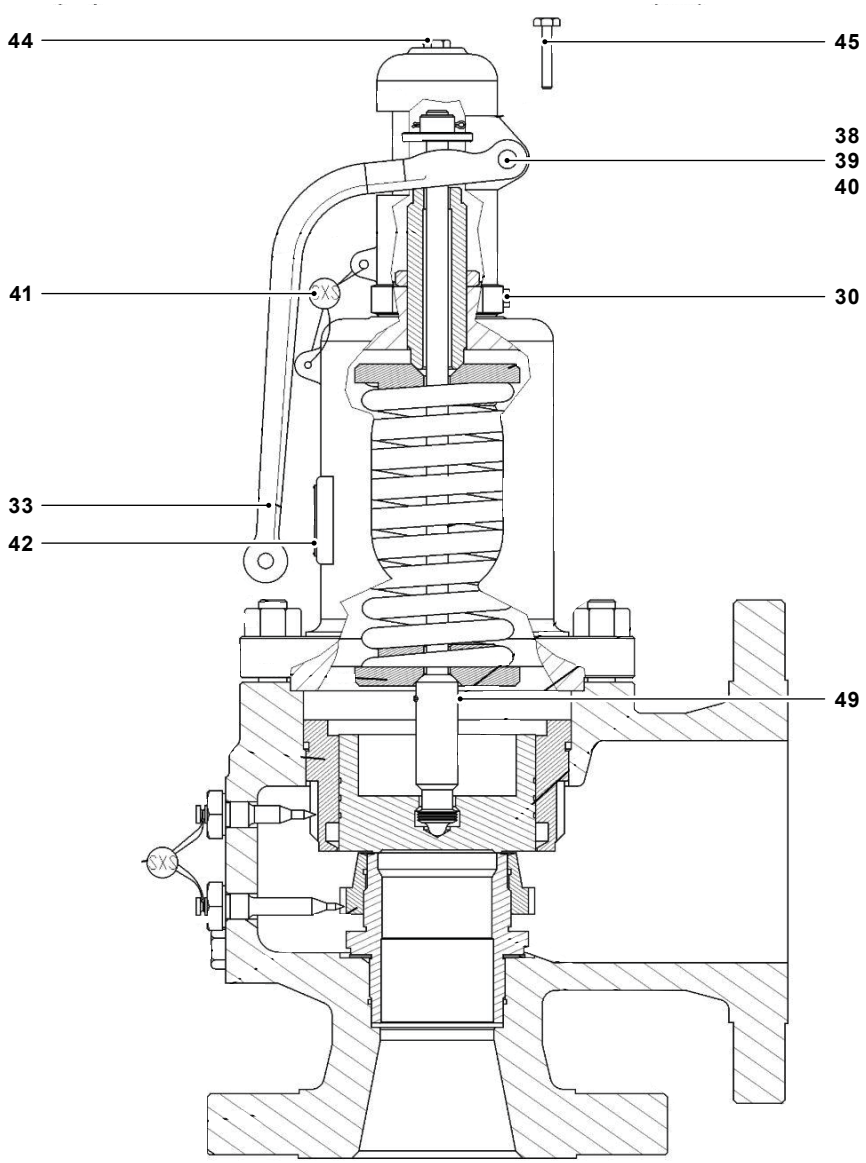


No.	Part		Material
19	Stem		304 St. St.
20	Spring Washer		Carbon Steel
21	Spring	up to 232°C / 450°F	Carbon Steel
		233 to 400°C / 451 to 752°F	High Temperature Alloy Steel
22	Bonnet		SA 216 Gr. WCB
23	Hex Nut (Body)		SA 194 Gr. 2H
24	Spring Adjusting Screw		304 St. St.
25	Adjusting Screw Locknut		304 St. St.
27	Stem Test Nut		Carbon Steel
28	Cotter Pin		Carbon Steel
29	Cap		Cast Iron

Other materials under request

Materials continued on next page

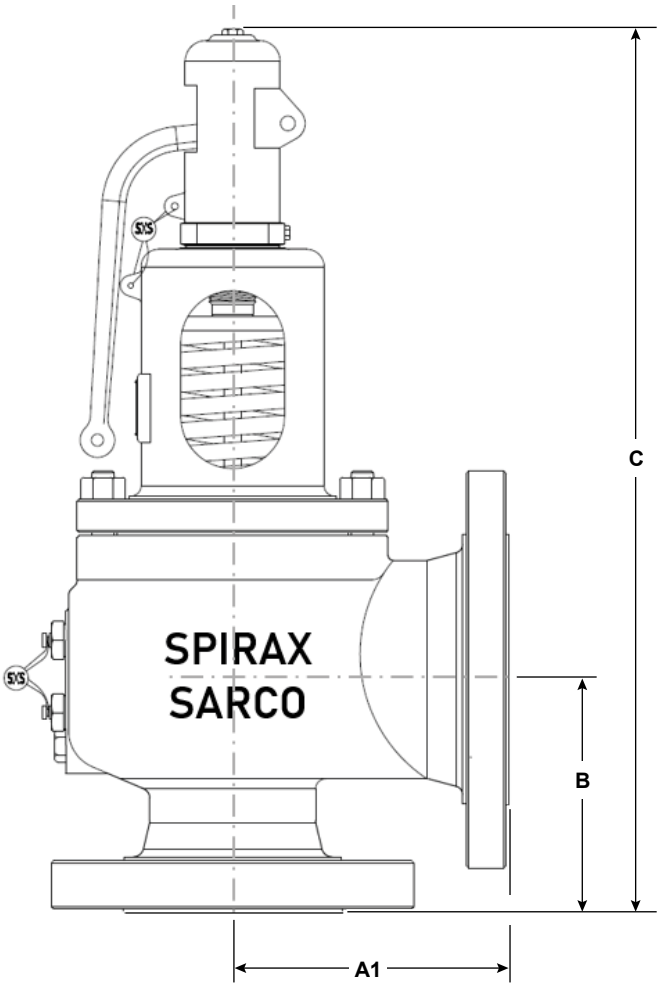
Materials (continued)



No.	Part	Material
30	Cap Screw	Carbon Steel
33	Test Lever	Cast Iron
38	Pin washer	Carbon Steel
39	Lever Pin	Carbon Steel
40	Cotter Pin	Carbon Steel
41	Seal	Lead
42	Nameplate	316 St. St.
44	Cap Plug	Carbon Steel
45	Test Gag	Carbon Steel
49	Stem Pin	Carbon Steel

Other materials under request

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Orifice	Size		Ratings		A1		B		C		Weight	
	Inlet	Outlet			mm	in	mm	in	mm	in	kg	lb
F	1½"	2"	300#	150#	108	4.25	114	4.49	399	15.71	14	31
G												
H		2½"			124	4.88	122	4.80	426	16.77	21	46
J												
K	2"	3"			142	5.59	133	5.25	480	18.90	28	62
L	2½"	4"			162	6.38	156	6.14	523	20.59	41	90
M	3"				165	6.50	165	6.50	640	25.20	53	117
N	4"	6"			191	7.52	184	7.25	682	26.85	90	198
P					210	8.27	181	7.13	736	28.98	96	212
Q	6"	8"			238	9.37	251	9.88	905	35.63	174	383
R					254	10	276	10.87	1040	40.94	287	632

Capacity Table - Steam - 3% Overpressure - kg/h

Set pressure (bar g)	Orifice Designation / Current Area (cm²)										
	F	G	H	J	K	L	M	N	P	Q	R
	2.112	3.464	5.433	8.867	12.69	19.71	24.81	29.90	44.06	76.20	110.47
1.0	204	335	525	857	1226	1904	2397	2888	4256	7361	10671
1.5	251	412	647	1055	1511	2346	2953	3559	5245	9070	13150
2.0	299	490	769	1254	1795	2788	3510	4230	6233	10780	15628
2.5	346	568	890	1453	2080	3231	4066	4901	7222	12489	18106
3.0	394	645	1012	1652	2365	3673	4623	5571	8210	14199	20585
3.5	441	723	1134	1851	2649	4115	5180	6242	9198	15908	23063
4.0	488	801	1256	2050	2934	4557	5736	6913	10187	17618	25541
4.5	536	879	1378	2249	3219	4999	6293	7584	11175	19327	28019
5.0	584	958	1502	2452	3509	5450	6860	8268	12183	21071	30547
5.5	633	1038	1628	2657	3802	5906	7434	8959	13202	22832	33100
6.0	682	1118	1753	2862	4095	6361	8007	9650	14220	24592	35652
6.5	730	1198	1879	3067	4389	6817	8580	10341	15238	26353	38205
7.0	779	1278	2004	3271	4682	7272	9154	11032	16256	28114	40758
7.5	828	1358	2130	3476	4975	7727	9727	11722	17274	29875	43310
8.0	877	1438	2256	3681	5268	8183	10300	12413	18292	31635	45863
8.5	926	1518	2381	3886	5562	8638	10873	13104	19310	33396	48416
9.0	974	1598	2507	4091	5855	9094	11447	13795	20328	35157	50968
9.5	1023	1678	2632	4296	6148	9549	12020	14486	21346	36918	53521
10	1072	1758	2758	4501	6441	10005	12593	15177	22364	38678	56073
12	1267	2078	3260	5320	7614	11826	14886	17941	26437	45721	66284
14	1462	2399	3762	6140	8787	13648	17180	20704	30509	52764	76494
16	1658	2719	4264	6959	9960	15470	19473	23468	34581	59807	86705
18	1853	3039	4766	7779	11133	17292	21766	26231	38654	66850	96915
20	2048	3359	5269	8599	12306	19113	24059	28995	42726	73893	107126
20.7	2116	3471	5444	8885	12716	19751	24862	29962	44152	76358	110699

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - Steam - 3% Overpressure – lb/h

Set pressure (psi g)	Orifice Designation / Current Area (in²)										
	F	G	H	J	K	L	M	N	P	Q	R
	0.328	0.537	0.841	1.375	1.968	3.054	3.846	4.634	6.830	11.812	17.121
15	457	748	1171	1915	2741	4253	5356	6453	9511	16449	23842
20	529	866	1356	2217	3173	4924	6201	7471	11011	19043	27603
25	601	984	1541	2519	3605	5595	7045	8489	12512	21638	31363
30	673	1102	1725	2821	4037	6265	7890	9507	14012	24232	35124
35	745	1220	1910	3123	4470	6936	8735	10525	15512	26827	38884
40	817	1338	2095	3425	4902	7607	9580	11542	17012	29421	42645
50	961	1573	2464	4029	5766	8949	11269	13578	20013	34610	50166
60	1105	1809	2834	4633	6631	10290	12959	15614	23013	39799	57687
70	1251	2048	3207	5243	7504	11645	14665	17670	26043	45040	65284
80	1399	2291	3587	5865	8395	13027	16405	19767	29134	50385	73031
90	1548	2534	3968	6487	9285	14409	18146	21863	32224	55729	80777
100	1696	2777	4348	7109	10176	15791	19886	23960	35315	61074	88524
110	1844	3020	4729	7732	11066	17173	21626	26057	38405	66419	96271
120	1993	3263	5109	8354	11956	18554	23366	28154	41495	71763	104018
130	2141	3505	5490	8976	12847	19936	25106	30250	44586	77108	111765
140	2290	3748	5871	9598	13737	21318	26847	32347	47676	82452	119511
150	2438	3991	6251	10220	14628	22700	28587	34444	50767	87797	127258
160	2586	4234	6632	10842	15518	24082	30327	36541	53857	93142	135005
180	2883	4720	7393	12087	17299	26846	33807	40734	60038	103831	150499
190	3032	4963	7773	12709	18190	28227	35548	42831	63128	109176	158245
200	3180	5206	8154	13331	19080	29609	37288	44928	66218	114520	165992
230	3625	5935	9295	15197	21752	33755	42509	51218	75490	130554	189233
260	4071	6664	10437	17064	24423	37900	47729	57508	84761	146588	212473
270	4219	6907	10817	17686	25314	39282	49469	59605	87851	151933	220220
300	4664	7636	11959	19552	27985	43428	54690	65895	97122	167966	243460

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - Steam - 10% Overpressure - kg/h

Set pressure (bar g)	Orifice Designation / Current Area (cm²)										
	F	G	H	J	K	L	M	N	P	Q	R
	2.112	3.464	5.433	8.867	12.69	19.71	24.81	29.90	44.06	76.20	110.47
1.0	210	345	541	883	1264	1963	2471	2978	4389	7590	11004
1.5	258	423	663	1082	1549	2405	3028	3649	5377	9299	13482
2.0	305	500	785	1281	1833	2848	3584	4320	6366	11009	15960
2.5	357	585	917	1497	2143	3328	4189	5048	7439	12865	18651
3.0	409	670	1051	1716	2456	3814	4801	5786	8526	14746	21378
3.5	461	756	1185	1935	2769	4301	5413	6524	9614	16626	24104
4.0	513	841	1320	2154	3082	4787	6026	7262	10701	18507	26830
4.5	565	927	1454	2372	3395	5273	6638	8000	11788	20387	29556
5.0	617	1012	1588	2591	3708	5760	7250	8737	12875	22267	32282
5.5	669	1098	1722	2810	4021	6246	7862	9475	13963	24148	35008
6.0	721	1183	1856	3029	4335	6733	8475	10213	15050	26028	37734
6.5	774	1269	1990	3248	4648	7219	9087	10951	16137	27909	40460
7.0	826	1354	2124	3466	4961	7705	9699	11689	17225	29789	43186
7.5	878	1440	2258	3685	5274	8192	10311	12427	18312	31670	45912
8.0	930	1525	2392	3904	5587	8678	10924	13165	19399	33550	48639
8.5	982	1611	2526	4123	5900	9164	11536	13902	20486	35430	51365
9.0	1034	1696	2660	4342	6214	9651	12148	14640	21574	37311	54091
9.5	1086	1782	2794	4560	6527	10137	12760	15378	22661	39191	56817
10	1138	1867	2928	4779	6840	10624	13373	16116	23748	41072	59543
12	1347	2209	3465	5655	8092	12569	15821	19067	28097	48593	70447
14	1555	2551	4001	6530	9345	14515	18270	22019	32446	56115	81352
16	1764	2893	4537	7405	10598	16460	20719	24970	36796	63636	92256
18	1972	3235	5074	8280	11850	18406	23168	27922	41145	71158	103161
20	2181	3577	5610	9156	13103	20351	25617	30873	45494	78680	114065
20.7	2254	3696	5798	9462	13541	21032	26475	31906	47016	81312	117882

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - Steam - 10% Overpressure - lb/h

Set pressure (psi g)	Orifice Designation / Current Area (in²)										
	F	G	H	J	K	L	M	N	P	Q	R
	0.328	0.537	0.841	1.375	1.968	3.054	3.846	4.634	6.830	11.812	17.121
15	471	771	1208	1975	2827	4387	5525	6657	9811	16968	24594
20	543	889	1393	2277	3259	5058	6370	7675	11311	19562	28355
25	615	1007	1578	2579	3692	5729	7214	8692	12812	22157	32115
30	687	1125	1762	2881	4124	6399	8059	9710	14312	24751	35876
35	767	1255	1965	3213	4599	7137	8988	10830	15962	27605	40013
40	846	1385	2169	3546	5075	7875	9918	11950	17612	30459	44149
50	1004	1644	2575	4210	6026	9351	11776	14189	20913	36167	52423
60	1163	1904	2981	4875	6977	10827	13634	16428	24213	41875	60696
70	1321	2163	3388	5539	7928	12303	15493	18667	27514	47583	68969
80	1480	2423	3794	6203	8879	13778	17351	20907	30814	53291	77242
90	1638	2682	4201	6868	9830	15254	19210	23146	34114	58998	85516
100	1797	2942	4607	7532	10781	16730	21068	25385	37415	64706	93789
110	1955	3201	5013	8197	11732	18206	22927	27624	40715	70414	102062
120	2114	3461	5420	8861	12683	19681	24785	29864	44016	76122	110336
130	2272	3720	5826	9526	13634	21157	26644	32103	47316	81830	118609
140	2431	3980	6233	10190	14585	22633	28502	34342	50616	87538	126882
150	2589	4239	6639	10854	15536	24109	30361	36581	53917	93245	135155
160	2748	4499	7045	11519	16487	25584	32219	38821	57217	98953	143429
180	3065	5018	7858	12848	18389	28536	35936	43299	63818	110369	159975
190	3223	5277	8265	13512	19340	30012	37795	45538	67119	116077	168249
200	3382	5537	8671	14177	20291	31488	39653	47778	70419	121785	176522
230	3857	6315	9890	16170	23144	35915	45229	54496	80320	138908	201342
260	4333	7094	11109	18163	25996	40342	50804	61213	90222	156032	226162
270	4491	7353	11516	18828	26947	41818	52663	63453	93522	161740	234435
300	4967	8132	12735	20821	29800	46245	58238	70170	103423	178863	259255

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity table - AIR - 10% Overpressure - Nm3/h (0ºC and 1.013 bar)

Set pressure (bar g)	Orifice Designation / Current Area (cm²)										
	F	G	H	J	K	L	M	N	P	Q	R
	2.112	3.464	5.433	8.867	12.69	19.71	24.81	29.90	44.06	76.20	110.47
1.0	274	449	704	1149	1644	2553	3214	3873	5708	9871	14311
1.5	335	550	862	1407	2014	3128	3938	4746	6993	12095	17534
2.0	397	651	1021	1666	2384	3703	4662	5618	8279	14318	20757
2.5	464	761	1193	1947	2787	4328	5448	6566	9675	16732	24258
3.0	532	872	1367	2232	3194	4961	6244	7525	11089	19178	27803
3.5	599	983	1542	2516	3601	5593	7040	8485	12503	21624	31349
4.0	667	1094	1716	2801	4008	6226	7837	9444	13917	24069	34894
4.5	735	1205	1890	3085	4416	6858	8633	10404	15331	26515	38440
5.0	803	1317	2065	3370	4823	7491	9429	11364	16745	28960	41985
5.5	870	1428	2239	3655	5230	8124	10226	12323	18159	31406	45530
6.0	938	1539	2414	3939	5637	8756	11022	13283	19574	33852	49076
6.5	1006	1650	2588	4224	6045	9389	11818	14243	20988	36297	52621
7.0	1074	1761	2762	4508	6452	10021	12614	15202	22402	38743	56167
7.5	1142	1872	2937	4793	6859	10654	13411	16162	23816	41188	59712
8.0	1209	1984	3111	5077	7267	11286	14207	17121	25230	43634	63258
8.5	1277	2095	3285	5362	7674	11919	15003	18081	26644	46080	66803
9.0	1345	2206	3460	5647	8081	12552	15799	19041	28058	48525	70349
9.5	1413	2317	3634	5931	8488	13184	16596	20000	29472	50971	73894
10	1481	2428	3809	6216	8896	13817	17392	20960	30886	53416	77440
12	1752	2873	4506	7354	10525	16347	20577	24799	36543	63199	91622
14	2023	3318	5204	8492	12154	18877	23762	28637	42199	72981	105804
16	2294	3762	5901	9631	13783	21408	26947	32476	47855	82764	119986
18	2565	4207	6598	10769	15412	23938	30132	36314	53512	92546	134168
20	2836	4652	7296	11907	17041	26468	33317	40153	59168	102329	148350
20.7	2931	4807	7540	12306	17612	27354	34432	41496	61148	105752	153313

For sizing using current areas (ASME), the discharge coefficient K for steam is 0.853.

Capacity Table - AIR - 10% Overpressure - SCFM (60ºF and 14.7 psi)

Set pressure (psi g)	Orifice Designation / Current Area (in²)										
	F	G	H	J	K	L	M	N	P	Q	R
	0.328	0.537	0.841	1.375	1.968	3.054	3.846	4.634	6.830	11.812	17.121
15	168	275	430	703	1007	1562	1967	2371	3494	6043	8758
20	193	317	496	811	1161	1801	2268	2733	4028	6966	10098
25	219	359	562	918	1315	2040	2569	3096	4562	7890	11437
30	245	401	628	1026	1469	2279	2870	3458	5097	8814	12776
35	273	447	700	1144	1638	2542	3201	3857	5684	9831	14249
40	301	493	772	1263	1807	2805	3532	4255	6272	10847	15722
50	358	586	917	1499	2146	3330	4194	5053	7447	12880	18669
60	414	678	1062	1736	2485	3856	4855	5850	8623	14912	21615
70	471	770	1206	1973	2823	4381	5517	6648	9798	16945	24561
80	527	863	1351	2209	3162	4907	6179	7445	10973	18978	27507
90	583	955	1496	2446	3501	5432	6841	8243	12149	21010	30454
100	640	1048	1641	2682	3839	5958	7503	9040	13324	23043	33400
110	696	1140	1785	2919	4178	6483	8165	9837	14499	25076	36346
120	753	1232	1930	3156	4517	7009	8826	10635	15675	27108	39292
130	809	1325	2075	3392	4855	7534	9488	11432	16850	29141	42239
140	866	1417	2220	3629	5194	8060	10150	12230	18025	31174	45185
150	922	1510	2364	3865	5533	8585	10812	13027	19201	33206	48131
160	979	1602	2509	4102	5871	9111	11474	13825	20376	35239	51077
180	1091	1787	2798	4575	6548	10162	12797	15420	22727	39304	56970
190	1148	1879	2943	4812	6887	10688	13459	16217	23902	41337	59916
200	1204	1972	3088	5049	7226	11213	14121	17014	25077	43370	62862
230	1374	2249	3522	5758	8242	12790	16107	19407	28603	49468	71701
260	1543	2526	3956	6468	9258	14366	18092	21799	32129	55566	80540
270	1599	2619	4101	6705	9596	14892	18754	22597	33305	57598	83486
300	1769	2896	4535	7415	10612	16469	20740	24989	36831	63696	92325

For sizing using current areas (ASME), the discharge coefficient K for air, gases and vapours is 0.853

Correction Factor (Ks) for Superheated Steam

Set Pressure		Satured Steam Temperature		Temperature											
				°C											
bar g	psi g	°C	°F	160	170	180	190	200	210	230	240	250	260	270	280
				°F											
				320	340	360	380	400	420	440	460	480	500	520	540
1.0	15	122	250	1.00	0.99	0.99	0.98	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
1.5	20	128	259	1.00	0.99	0.99	0.98	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
2.0	30	134	274	1.00	0.99	0.99	0.98	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
3.0	45	144	292	1.00	0.99	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
4.0	60	152	308	1.00	1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
5.0	70	160	316		1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
5.5	80	162	324		1.00	1.00	0.99	0.98	0.98	0.97	0.96	0.94	0.93	0.92	0.91
7.0	100	171	338			1.00	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92
8.5	120	178	350				1.00	1.00	0.99	0.98	0.96	0.95	0.94	0.93	0.92
9.5	140	182	361					1.00	0.99	0.98	0.96	0.95	0.94	0.93	0.92
12	175	192	378					1.00	0.99	0.98	0.97	0.95	0.94	0.93	0.92
14	205	198	390					1.00	0.99	0.99	0.97	0.96	0.95	0.93	0.92
16	230	205	400					1.00	0.99	0.99	0.98	0.97	0.95	0.94	0.93
18	260	210	410						1.00	0.99	0.98	0.97	0.96	0.94	0.93
21	305	217	423							1.00	1.00	0.99	0.97	0.95	0.94

Correction Factor (Ks) for Superheated Steam table continued on next page

Correction Factor (Ks) for Superheated Steam (continued)

Set Pressure		Satured Steam Temperature		Temperature										
				°C										
bar g	psi g	°C	°F	290	300	320	330	340	350	360	370	380	390	400
				°F										
				560	580	600	620	640	660	680	700	720	740	750
1.0	15	122	250	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.83	0.82
1.5	20	128	259	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.83	0.82
2.0	30	134	274	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.84	0.83	0.82
3.0	45	144	292	0.90	0.89	0.88	0.87	0.87	0.86	0.85	0.84	0.84	0.83	0.82
4.0	60	152	308	0.90	0.89	0.88	0.87	0.87	0.86	0.85	0.84	0.84	0.83	0.82
5.0	70	160	316	0.90	0.89	0.88	0.87	0.87	0.86	0.85	0.84	0.84	0.83	0.82
5.5	80	162	324	0.90	0.89	0.89	0.88	0.87	0.86	0.85	0.84	0.84	0.83	0.82
7.0	100	171	338	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83	0.82
8.5	120	178	350	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83	0.82
9.5	140	182	361	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83	0.82
12	175	192	378	0.91	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82
14	205	198	390	0.91	0.91	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.84	0.83
16	230	205	400	0.92	0.91	0.90	0.89	0.87	0.87	0.86	0.85	0.84	0.84	0.83
18	260	210	410	0.92	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.83
21	305	217	423	0.93	0.91	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83

For superheated steam capacity, multiply saturated steam capacity by the correction factor (Ks).

How to order

The following information is required for the correct sizing and selection of SV44H Safety Valves:

1) Fluid
2) Required Capacity (Flow)
3) Operating Pressure and Set Pressure
4) Operating Temperature and Relieving Temperature
5) Back pressure
6) Overpressure
7) Molecular Weight (Gases)

Spirax Sarco provides on its website the PSV Calc software for the calculation, sizing, and selection of Safety and Relief Valves.

TI-P277-01-US
Issue 2

Drip Pan Elbow

Description

The Drip Pan Elbow, when used in conjunction with a safety relief valve, provides a suitable unrestricted, self-draining outlet. This improves the performance and longevity of the safety valve by alleviating axial loads on the valve, which could impair its operation and shut off.

Model	DPE	
Sizes	¾" to 4" (DN20 to DN100)	6" and 8" (DN150 and DN200)
Connections	Female NPT	Flanged ANSI 125
Construction	Cast iron (ASTM A126 CL B)	

Typical applications

Specifically for use on the outlet connection of safety/relief valves to assure unrestricted discharge.

Limiting operating conditions

Maximum operating pressure (PMO)	250 psig (17) bar g)
Maximum operating Temperature (TMO)	450 °F (232 °C) at all operating pressures

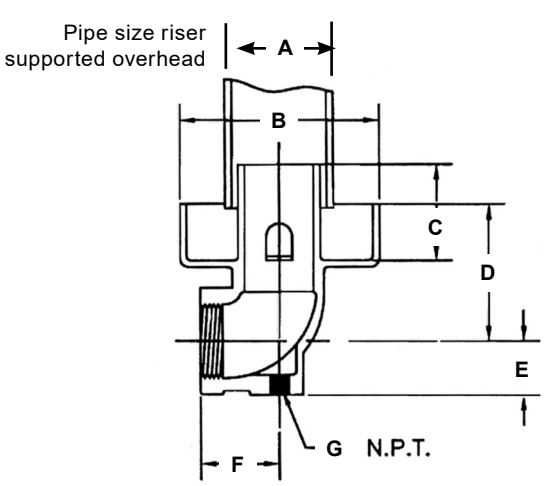
Installation

The Drip Pan Elbow is to be connected to the discharge connection of the safety/relief valve by a short pipe nipple. Flanged valves 4" and smaller will require a companion flange and short nipple the same size as the valve outlet. The drain connection on the bottom of the elbow should be piped to waste.
Please refer to ASME code for additional installation details.

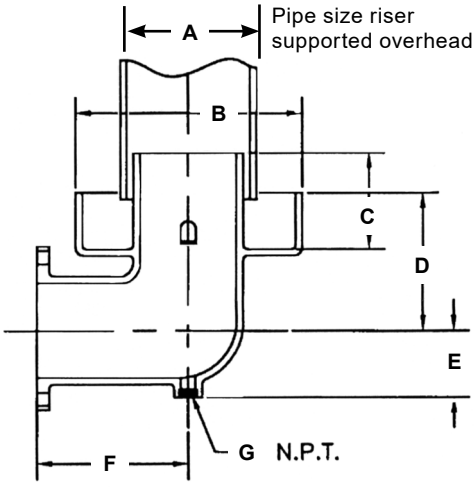
Sample specification

Drip Pan Elbows for use with safety/relief valves shall be ASTM A126 CL B Cast Iron, and be of the same size as the valve outlet or larger. Pipe as shown on the drawings opposite.

Dimensions (nominal) in inches (mm) and lbs (kg)



Sizes: ¾" - 4"
Construction material:
A126-B Cast iron



Sizes: 6" - 8"
Construction material:
A126-B Cast iron

Size inlet	A	B	C	D	E	F	G. NPT	Weight
¾" (DN20)	1.5 (38)	3.75 (95)	1.75 (44)	2.75 (70)	1.0 (25)	1.5 (38)	¼ (6)	2 (1)
1" (DN25)	1.5 (38)	3.75 (95)	1.75 (44)	2.75 (70)	1.0 (25)	1.5 (38)	¼ (6)	2 (1)
1¼" (DN32)	2.5 (64)	5.5 (140)	2.47 (63)	4.13 (105)	1.44 (37)	2.13 (54)	3/8 (10)	7.5 (3)
1½" (DN40)	2.5 (64)	5.5 (140)	2.47 (63)	4.13 (105)	1.44 (37)	2.13 (54)	3/8 (10)	7.5 (3)
2" (DN50)	3.0 (76)	6.25 (159)	2.31 (59)	3.63 (92)	1.63 (41)	2.25 (57)	½ (15)	8.5 (4)
2½" (DN65)	4.0 (102)	7.38 (187)	3.0 (76)	4.31 (109)	1.94 (49)	2.69 (68)	¾ (20)	12 (5)
3" (DN80)	4.0 (102)	8.0 (203)	3.5 (89)	4.88 (124)	2.31 (59)	3.13 (80)	¾ (20)	19 (9)
4" (DN100)	6.0 (152)	9.63 (245)	4.5 (114)	5.75 (146)	2.88 (73)	3.75 (95)	¾ (20)	25 (11)
6" (DN150)	8.0 (203)	12.75 (324)	6.63 (168)	7.44 (189)	4.19 (106)	8.0 (203)	¾ (20)	105 (48)
8" (DN200)	10.0 (254)	16.5 (419)	7.5 (191)	9.44 (240)	5.38 (137)	10.75 (273)	1 (25)	202 (92)

TI-P272-01-US
Issue 1

SV5601 and 5708 Series Bronze Safety Valves ASME Section I & VIII - NB Certified for Air, Gas and Steam

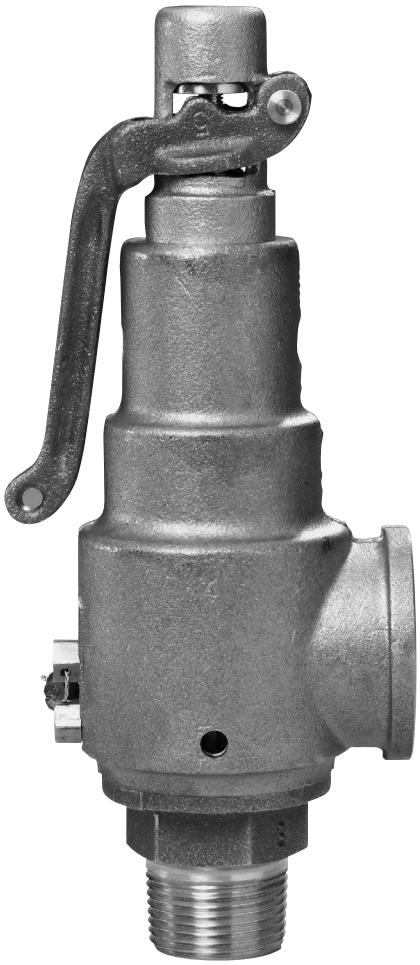
Description
Spirax Sarco Bronze valve line is a high capacity safety valve used for boilers, piping lines and vessel protection. Designed and engineered for heavy-duty industrial use. ASME approved and National Board flow-rated for capacity.

Sizes from ½" to 2½"; NB rated to 250#; Temperatures to 406 °F.

Usages
SV5601 Series is used for ASME Section I applications to pressure ratings of 250 psi g. V and NB stamped for fired vessels. Boilers, or most areas where steam safety valves are required.

SV5708 Series is used for ASME Section VIII applications to pressure ratings of 250 psi g. UV and NB stamped for unfired vessel protection. Used for many applications to protect or relieve pressure for Air, Gas and Steam.

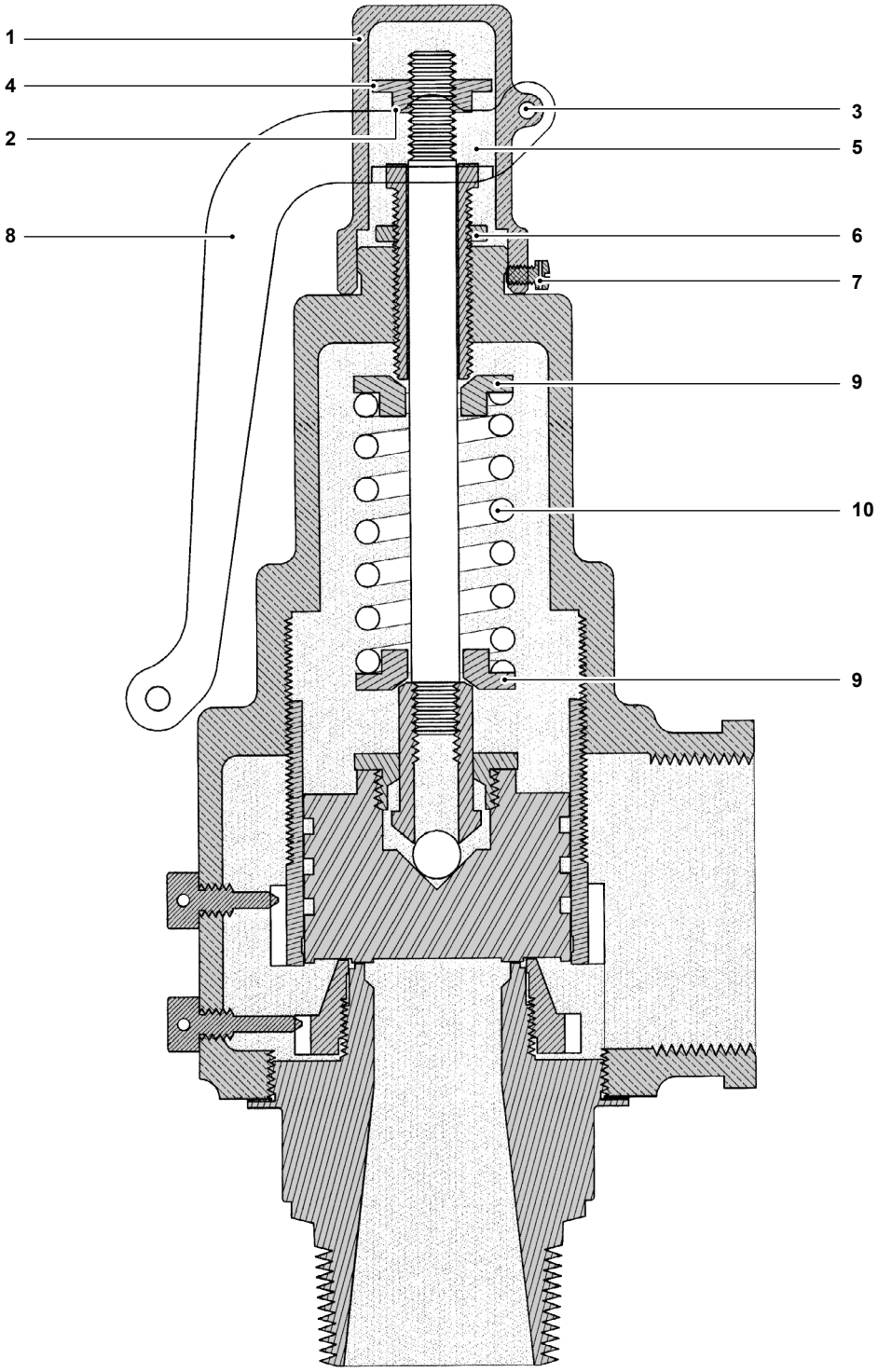
Features
- Designed for durability
- 6 orifices – 12 sizes of piping options
- Top guided seating and discharge
- Full nozzle; high capacity levels
- Excellent re-seating characteristics with pivoting ball-post design
- Short, tuned blow-down and can be adjusted with double ring to meet specific requirements
- Heavy duty hood and lever mechanism
- Standard 17-7 stainless steel springs



Options
- Stainless steel whetted trimming package (seat, disk and interiors)
- O-ring seating. (Teflon, EDPM, Viton,or as specified)
- Bubble tight seating options
- Anti vibrating spring for lift lever
- Packed lift lever
- BPT pipe threading

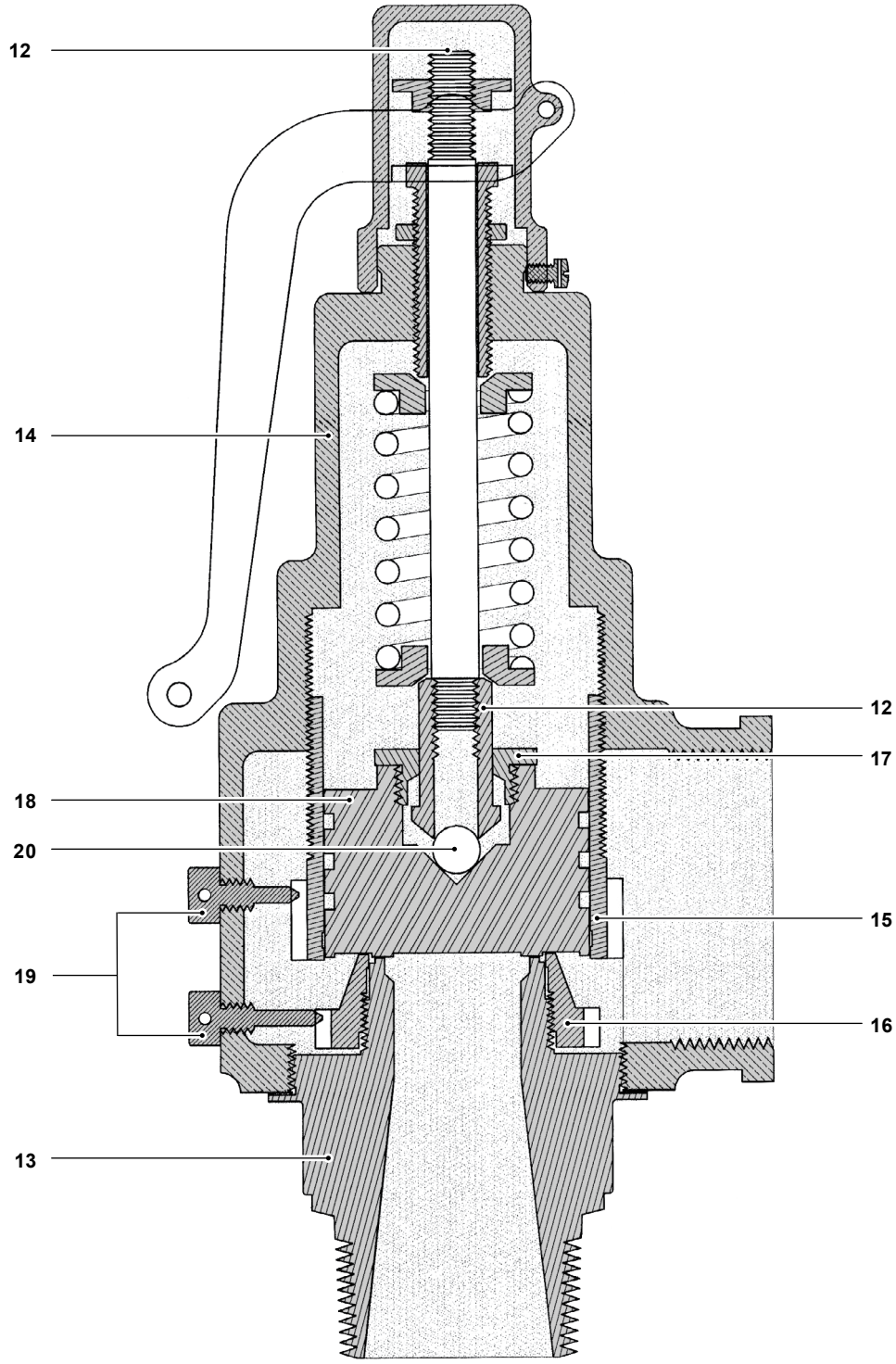
Ordering
Specify Section I or VIII valves, set pressure psi g, capacity requirements when ordering.

Materials



Item	Part	Material	
1	Hood	Cast Brass	
2	Cotter Pin		
3	Lift Lever Pin	Brass	
4	Lifter Nut	Brass	ASTM B-16
5	Pressure Screw	Brass	ASTM B-16

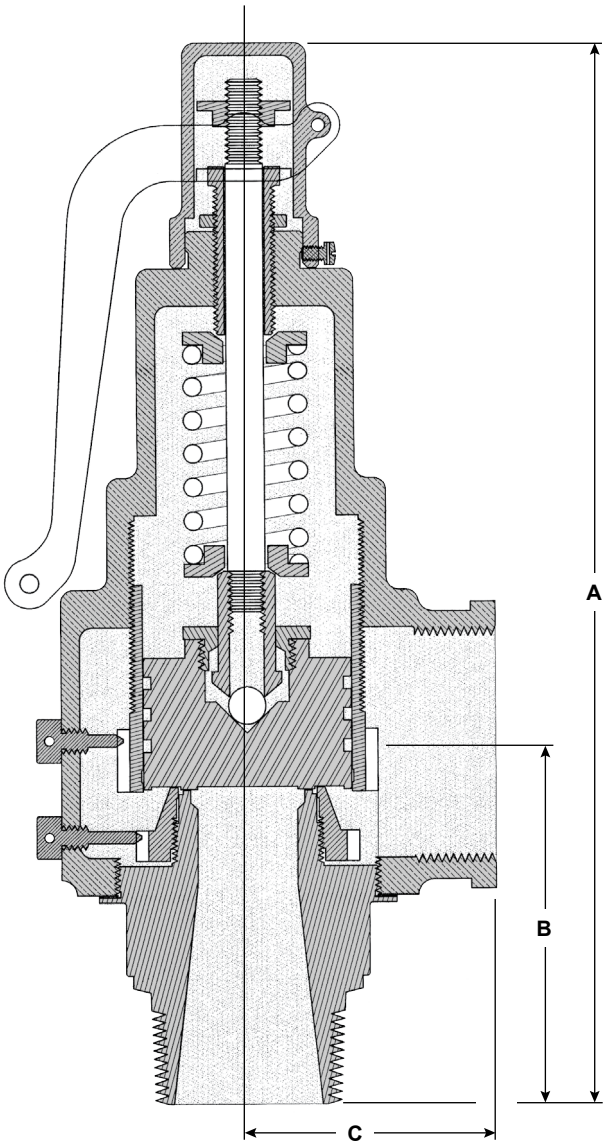
Item	Part	Material	
6	Lock Nut	Brass	ASTM B-16
7	Hood Screw	Brass	
8	Lift Lever	Cast Brass	
9	Spring Plate	Brass	ASTM B-16
10	Spring	Stainless Steel	



Item	Part	Material	
11	Nameplate	Aluminum	
12	Spring Post	Brass	ASTM B-16
13	Body	Brass/Cast Brass	ASTM B-16/B-61,62
14	Bonnet	Cast Brass	ASTM B-61,62
15	Upper Ring	Cast Brass	
16	Lower Ring	Cast Brass	

Item	Part	Material	
17	Disc Nut	Brass	ASTM B-16
18	Disc	Brass	ASTM B-16
19	Regulator Screw	Brass	ASTM B-16
20	Ball Bearing	Stainless Steel	

Orifice, inlet, outlet, size and dimensions/weights (approximate) in inches and lbs



Orifice I.D.	Orifice size	Inlet	Outlet	Size I.D.	Dimensions A	Dimensions B	Dimensions C	Weight
D	0.125	½"	¾"	C	7.3	2.5	1.5	1.9
D	0.125	¾"		D				2.2
E	0.221		1"	D	7.6		1.6	2.8
E	0.221	1"		E				3.0
F	0.352		1¼"	E	8.6	2.8	1.8	4.0
F	0.352	1¼"		F				4.2
G	0.567		1½"	F	9.3	3.2	2.3	6.7
G	0.567	1½"		G				6.9
H	0.899		2"	G	10.9	3.6	2.5	11.4
H	0.899	2"		H				11.6
J	1.463		2½"	H	12.1	3.9	3.1	15.6
J	1.463	2½"		J				16.3

Sample specification

¾" x E x 1" Spirax Sarco Bronze Series Safety Valve shall be fitted with exclosed spring and external lifting lever. Furnish with manufacturer's standard connections and valve body of cast brass with bronze internals. When ordering Safety Valves for use on power boilers, specify (V) code stamp as required by ASME Code Section I.

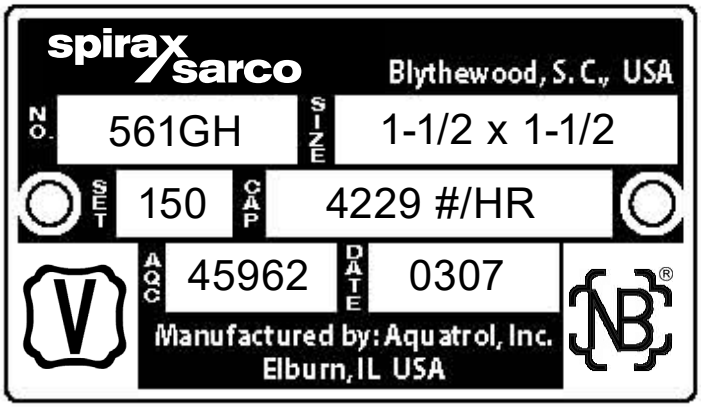
Installation

Valve should be installed in vertical upright position as close as possible to the connection provided with no unnecessary intervening pipe or fitting. Under no circumstances should there be a shut off valve or restriction of any kind between the safety valve and the connection provided. For full details on proper installation, please refer to the installation, operating and maintenance instructions, IM-3-215-US.

Maintenance

This product is factory sealed for tamper-proof operation, and no repair parts are available. Test the safety valve every 6 months (depending on plant age and condition), preferably by raising the system pressure to the safety valve's set pressure or operating the hand lever. For full details on proper maintenance, please refer to the installation, operating and maintenance instructions, IM-3-215-US.

Nameplate identification



NO =	Model Identification
G =	Orifice
H =	Piping Size
SIZE =	M x F Piping Size
SET =	Set Pressure (psi g)
CAP =	SCFM Air/Gas
AQC =	Internal Tracking (QA)
DATE =	Month/Year
V =	Fired Vessel (Sec. I)
UV =	Unfired Vessel (Sec. VIII)
NB =	National Board Certified

Capacities - Steam - ASME Section I - Series 5601

Capacity ratings based on pounds per hour of saturated steam at 3% over pressure. NB certified at 90% of accumulated flow.

Set pressure psi g	Orifice D .125	Orifice E .221	Orifice F .352	Orifice G .567	Orifice H .899	Orifice J 1.463
5*	120	211	337	542	860	1400
10*	147	260	414	667	1058	1722
15	175	309	492	792	1256	2044
20	213	377	601	967	1534	2496
25	230	406	647	1042	1653	2689
30	257	455	725	1167	1851	3012
35	285	504	802	1292	2049	3334
40	312	552	880	1417	2247	3657
45	340	601	957	1542	2445	3979
50	368	650	1035	1667	2643	4302
55	395	699	1113	1792	2842	4624
60	423	747	1190	1917	3040	4947
65	450	796	1268	2042	3238	5269
70	478	846	1347	2170	3440	5598
75	506	895	1426	2297	3642	5927
80	535	946	1507	2427	3848	6262
85	563	996	1586	2555	4050	6591
90	592	1046	1667	2685	4256	6927
95	620	1096	1746	2812	4459	7256
100	649	1147	1826	2942	4665	7591
110	705	1247	1986	3199	5073	8255
120	762	1347	2146	3457	5481	8920
130	819	1448	2306	3714	5889	9584
140	876	1548	2466	3972	6297	10248
150	932	1648	2626	4229	6706	10913
160	989	1749	2785	4487	7114	11577
170	1046	1849	2945	4744	7522	12241
180	1103	1949	3105	5002	7930	12905
190	1159	2050	3265	5259	8338	13570
200	1216	2150	3425	5517	8747	14234
210	1273	2251	3585	5774	9155	14898
220	1330	2351	3744	6031	9563	15563
230	1386	2451	3904	6289	9971	16227
240	1443	2552	4064	6546	10379	16891
250	1500	2652	4224	6804	10788	17556

***Note:**
Set pressures below 15 psi are not ASME coded and are not certified.

Capacities - Steam - ASME Section VIII - Series SV 5708

Capacity ratings based on pounds per hour of saturated steam at 10% over pressure. NB certified at 90% of accumulated flow.

Set pressure psi g	Orifice D .125	Orifice E .221	Orifice F .352	Orifice G .567	Orifice H .899	Orifice J 1.463
5*	125	221	352	567	900	1464
10*	153	270	430	692	1098	1787
15	180	319	507	817	1296	2109
20	208	367	585	942	1494	2431
25	235	416	663	1067	1692	2754
30	263	465	740	1192	1890	3076
35	293	518	826	1330	2108	3431
40	323	572	911	1467	2326	3786
45	354	625	996	1605	2544	4141
50	384	679	1082	1742	2762	4495
55	414	733	1167	1880	2980	4850
60	445	786	1252	2017	3198	5205
65	475	840	1338	2155	3416	5559
70	505	893	1423	2292	3634	5914
75	536	947	1508	2430	3852	6269
80	566	1001	1594	2567	4070	6624
85	596	1054	1679	2705	4288	6978
90	627	1108	1764	2842	4506	7333
95	657	1161	1850	2979	4724	7688
100	687	1215	1935	3117	4942	8043
110	748	1322	2106	3392	5378	8752
120	808	1429	2276	3667	5814	9461
130	869	1536	2447	3942	6250	10171
140	930	1644	2618	4217	6686	10880
150	990	1751	2789	4492	7122	11590
160	1051	1858	2959	4767	7558	12299
170	1111	1965	3130	5042	7994	13009
180	1172	2072	3301	5317	8430	13718
190	1233	2179	3471	5592	8866	14428
200	1293	2287	3642	5866	9302	15137
210	1354	2394	3813	6141	9737	15846
220	1415	2501	3983	6416	10173	16556
230	1475	2608	4154	6691	10609	17265
240	1536	2715	4325	6966	11045	17975
250	1596	2822	4495	7241	11481	18684

***Note:**
Set pressures below 15 psi are not ASME coded and are not certified.

Capacities - Air/Gas - ASME Section VIII - Series 5708

Capacity ratings based SCFM (standard cubit feet per minute) of air at 10% over pressure. NB certified at 90% of accumulated flow.

Set pressure psi g	Orifice D .125	Orifice E .221	Orifice F .352	Orifice G .567	Orifice H .899	Orifice J 1.463
5*	45	79	125	202	320	521
10*	54	96	153	246	391	636
15	64	113	181	291	461	751
20	74	131	208	335	532	865
25	84	148	236	380	602	980
30	94	165	263	424	673	1095
35	104	184	294	473	750	1221
40	115	204	324	522	828	1348
45	126	223	355	571	906	1474
50	137	242	385	620	983	1600
55	147	261	415	669	1061	1726
60	158	280	446	718	1138	1853
65	169	299	476	767	1216	1979
70	180	318	506	816	1294	2105
75	191	337	537	865	1371	2231
80	201	356	567	914	1449	2358
85	212	375	598	963	1526	2484
90	223	394	628	1012	1604	2610
95	234	413	658	1061	1681	2736
100	245	432	689	1109	1759	2863
110	266	471	750	1207	1914	3115
120	288	509	810	1305	2069	3368
130	309	547	871	1403	2225	3620
140	331	585	932	1501	2380	3873
150	352	623	993	1599	2535	4125
160	374	661	1053	1697	2690	4378
170	396	699	1114	1795	2845	4630
180	417	738	1175	1892	3000	4883
190	439	776	1236	1990	3156	5135
200	460	814	1296	2088	3311	5388
210	482	852	1357	2186	3466	5640
220	503	890	1418	2284	3621	5893
230	525	928	1479	2382	3776	6145
240	547	966	1539	2480	3931	6398
250	568	1005	1600	2577	4087	6650

***Note:**
Set pressures below 15 psi are not ASME coded and are not certified.

TI-P273-01-US
Issue 1

SV418 Series Bronze Safety Valves ASME Section VIII - NB Certified for Air, Gas, Steam and Liquid

Description

Spirax Sarco's SV418 safety and relief valve is designed for accuracy and reliability. Engineered for heavy-duty industrial usage. Multiple purpose safety and relief for Liquid, Steam, Air, and Gas services. ASME and National Board Certified for Section VIII service. ASME Section VIII to 750 psi (51.7 bar) for Liquid, Air, and Gas. 300 PSI for Steam.

Sizes from ½" to 3"; NB rated to 750#; Temperatures from -320 °F to 425 °F (-196 °C to 218 °C).

Features

- Full nozzle – top guided design
- Short, precise blow-down
- Wide choice of inlet/outlet sizes
- Excellent reseating characteristics
- Designed long term heavy industrial use
- Closed hex cap
- Back pressure tight
- Drainhole with threaded plug



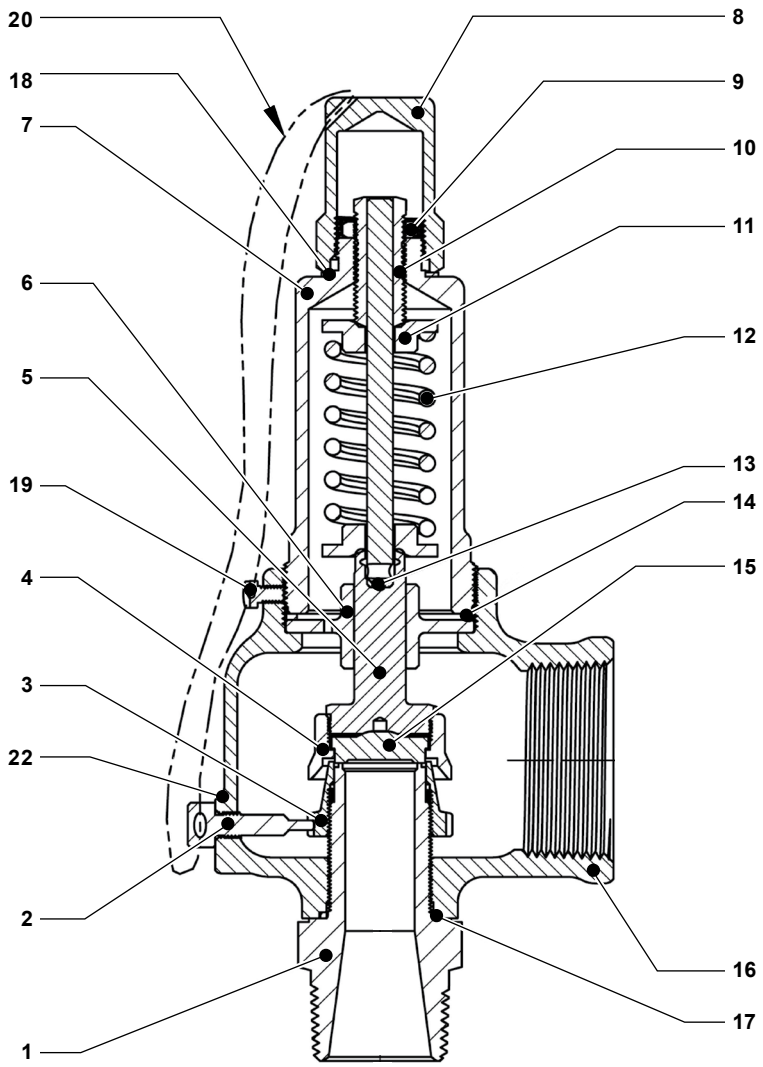
Options

- BSPT piping
- O2 Cleaning and cryogenic services

Usages

Pressure Vessels, Pumps, Hydraulics, Tanks, Steam Systems, Chemical, Cryogenic, Air and Gas Compressors, Separators, by-pass and over pressure protection. Choose for most industrial applications requiring a safety relief valve.

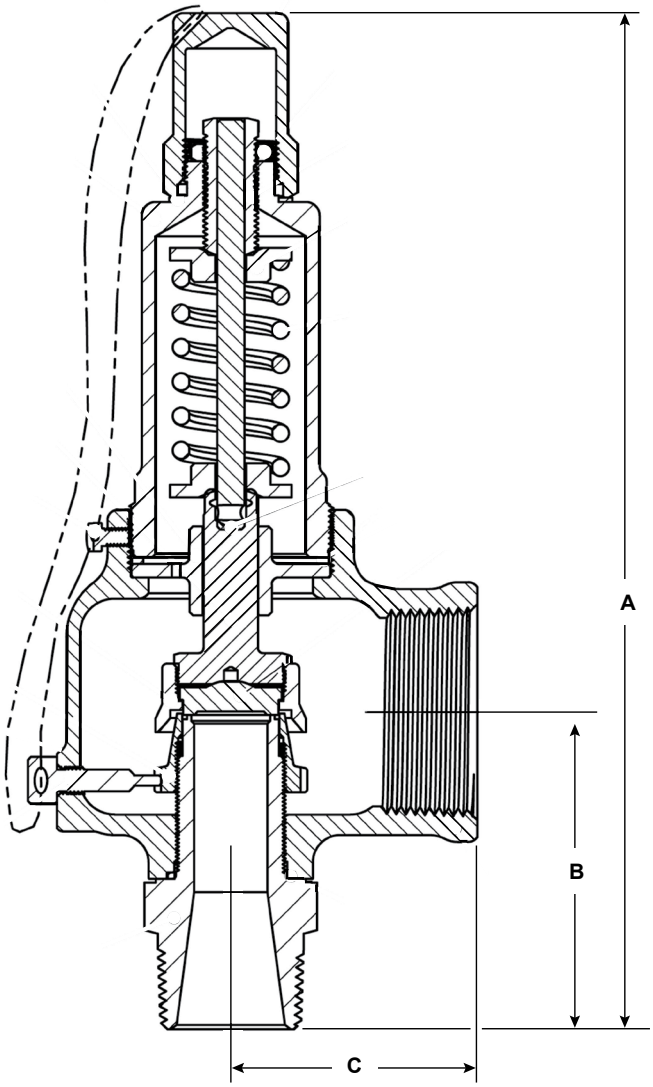
Materials



Item	Description	Series 418
1	Nozzle	SS
2	Lock screw	Brass
3	Lift	SS 316
4	Disk holder	SS 316
5	Disk holder shaft	SS 316
6	Disc guide	Brass
7	Bonnet	Bronze
8	Hood	Brass
9	Lock nut	Brass
10	Pressure screw	Brass
11	Spring plate	Brass

Item	Description	Series 418
12	Spring	SS 717
13	Spring post	Brass
14	Disc Guide Washer	PTFE
15	Disc	SS 316
16	Body	Bronze
17	Nozzle washer	PTFE
18	Gasket	PTFE
19	Lock screw	Brass
20	Seal wire	Steel
21	Nameplate	SS
22	Drain Plug	SS

Dimensions/weights (approximate) in inches and lbs (kg)



Orifice	Inlet	Outlet	Flow area	Size ID	A - Closed Cap	A - Lift Lever	B	C	Weight
D	½"	¾"	0.125	DC	7⅜"	8⅛"	2⅜"	1⅝"	2 lbs (0.91 kg)
D	½"	1"	0.125	DD	7⅜"	8⅛"	2⅜"	1⅝"	
D	¾"	¾"	0.125	DE	7⅜"	8⅛"	2⅜"	1⅝"	
D	¾"	1"	0.125	DF	7⅜"	8⅛"	2⅜"	1⅝"	
D	1"	1"	0.125	DG	7½"	8½"	2⅜"	1⅝"	
E	¾"	1"	0.221	EC	7⅝"	8⅜"	2⅝"	1⅝"	3 lbs (1.36 kg)
E	¾"	1¼"	0.221	ED	8⅛"	8⅞"	2⅝"	2"	
E	1"	1¼"	0.221	EF	8⅛"	9¼"	2⅝"	2"	
F	1"	1½"	0.353	FF	9⅝"	9⅝"	2⅞"	2¼"	5 lbs (2.27 kg)
F	1½"	1½"	0.353	FG	9⅝"	9⅝"	3⅛"	2¼"	
G	1¼"	2"	0.554	GG	10"	10¾"	3⅜"	2⅝"	9 lbs (4.08 kg)
G	2"	2"	0.554	GF	10¼	11"	3⅜"	2⅝"	
H	1½"	2½"	0.923	HH	11¾"	12⅛"	3½"	2¾"	16 lbs (7.26 kg)
J	2"	3"	1.421	JJ	13½"	14"	4"	3¼"	24 lbs (10.9 kg)

Sample specification

Spirax Sarco SV418: As required for equipment according to ASME Boiler and Pressure Vessel Code. Stainless steel full nozzle, top guided design. Stainless steel ring and disk. Stainless steel spring with adjustable pressure range and positive shutoff, factory set and sealed. Back pressure tight, includes drainhole with threaded plug.

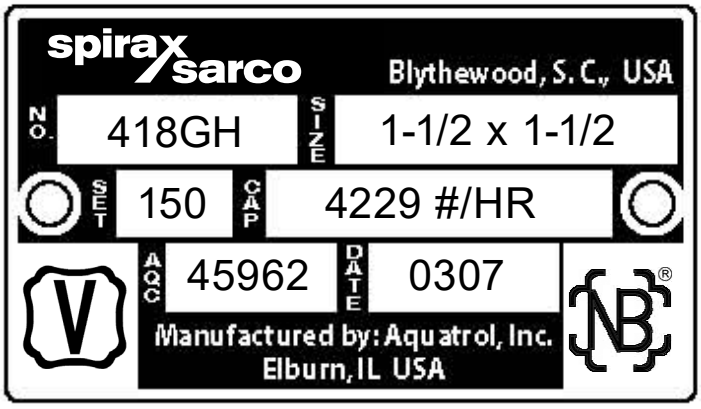
Installation

Valve should be installed in vertical upright position as close as possible to the connection provided with no unnecessary intervening pipe or fitting. Under no circumstances should there be a shut off valve or restriction of any kind between the safety valve and the connection provided. For full details on proper installation, please refer to the installation, operating and maintenance instructions, IM-3-215-US.

Maintenance

This product is factory sealed for tamper-proof operation, and no repair parts are available. Test the safety valve every 6 months (depending on plant age and condition), preferably by raising the system pressure to the safety valve's set pressure or operating the hand lever. For full details on proper maintenance, please refer to the installation, operating and maintenance instructions, IM-3-215-US.

Nameplate identification



NO =	Model Identification
G =	Orifice
H =	Piping Size
SIZE =	M x F Piping Size
SET =	Set Pressure (psig)
CAP =	SCFM Air/Gas
AQC =	Internal Tracking (QA)
DATE =	Month/Year
V =	Fired Vessel (Sec. I)
UV =	Unfired Vessel (Sec. VIII)
NB =	National Board Certified

Series 418 Capacities - Liquid • GPM

Capacity ratings based on 10% over pressure of water (liquid) NB certified at 90% of measured flow in GPM.

Set pressure psi	Orifice D 0.257	Orifice E 0.2173	Orifice F 0.3526	Orifice G 0.5542	Orifice H 0.9229	Orifice J 1.418
5	11	18	30	47	78	120
10	14	24	38	60	100	154
15	16	28	45	71	118	181
20	18	31	51	80	133	204
25	20	35	56	88	147	225
30	22	37	61	96	159	245
35	23	40	66	103	172	264
40	25	43	70	110	184	283
45	27	46	75	117	195	300
50	28	48	79	123	206	316
55	29	51	82	129	216	331
60	31	53	86	135	225	346
65	32	55	90	141	234	360
70	33	57	93	146	243	374
75	34	59	96	151	252	387
80	35	61	99	156	260	400
85	37	63	102	161	268	412
90	38	65	105	166	276	424
95	39	67	108	170	283	435
100	40	68	111	175	291	447
125	44	77	124	195	325	499
150	48	84	136	214	356	547
175	52	91	147	231	385	591
200	56	97	157	247	411	632
225	59	103	167	262	436	670
250	63	108	176	276	460	706
275	66	114	184	290	482	741
300	69	119	192	302	504	774
325	71	123	200	315	524	805
350	74	128	208	327	544	836
375	77	133	215	338	563	865
400	79	137	222	349	581	893
425	82	141	229	360	599	921
450	84	145	236	370	617	948
475	86	149	242	380	634	974
500	89	153	248	390	650	999
525	91	157	254			
550	93	161	260			
575	95	164	266			
600	97	168	272			
625	99	171				
650	101	175				
675	103	178				
700	105	181				
725	107	184				
750	108	187				

Series 418 Capacities - Air • SCFM

Capacity ratings based on SCFM (standard cubit feet per minute) of Air at 10% over pressure.
NB certified at 90% of measured flow.

Set pressure psi	Orifice D 0.257	Orifice E 0.2173	Orifice F 0.3526	Orifice G 0.5542	Orifice H 0.9229	Orifice J 1.418
5	46	79	129	202	337	518
10	56	97	157	247	411	632
15	66	114	186	292	486	746
20	76	132	214	336	560	860
25	86	149	242	381	634	975
30	97	167	271	425	709	1089
35	108	186	302	475	790	1214
40	119	205	333	524	872	1340
45	130	225	364	573	954	1465
50	141	244	396	622	1035	1591
55	152	263	427	671	1117	1716
60	163	282	458	720	1199	1842
65	174	301	489	769	1280	1967
70	186	321	520	818	1362	2093
75	197	340	552	867	1444	2218
80	208	359	583	916	1525	2344
85	219	378	614	965	1607	2469
90	230	398	645	1014	1689	2595
95	241	417	676	1063	1771	2720
100	252	436	708	1112	1852	2846
125	308	532	864	1358	2261	3474
150	364	628	1020	1603	2669	4101
175	419	725	1176	1848	3078	4729
200	475	821	1332	2093	3486	5356
225	530	917	1488	2339	3895	5984
250	586	1013	1644	2584	4303	6612
275	642	1109	1800	2829	4712	7239
300	697	1206	1956	3075	5120	7867
325	753	1302	2112	3320	5529	8494
350	809	1398	2268	3565	5937	9122
375	864	1494	2424	3810	6346	9750
400	920	1590	2580	4056	6754	10377
425	976	1686	2736	4301	7162	11005
450	1031	1783	2893	4546	7571	11632
475	1087	1879	3049	4792	7979	12260
500	1142	1975	3205	5037	8388	12888
525	1198	2071	3361			
550	1254	2167	3517			
575	1309	2263	3673			
600	1365	2360	3829			
625	1421	2456				
650	1476	2552				
675	1532	2648				
700	1588	2744				
725	1643	2841				
750	1699	2937				

Series 418 Capacities - Steam • Lbs/Hr

Capacity ratings based on pounds per hour of saturated steam at 10% over pressure.
NB certified at 90% of accumulated flow.

Set pressure psi	Orifice D 0.257	Orifice E 0.2173	Orifice F 0.3526	Orifice G 0.5542	Orifice H 0.9229	Orifice J 1.418
5	129	223	362	569	947	1455
10	157	272	442	694	1156	1776
15	186	321	521	819	1365	2097
20	214	370	601	945	1573	2417
25	243	420	681	1070	1782	2738
30	271	469	761	1195	1991	3058
35	302	523	848	1333	2220	3411
40	334	577	936	1471	2450	3764
45	365	631	1024	1609	2679	4116
50	396	685	1111	1747	2909	4469
55	427	739	1199	1884	3138	4822
60	459	793	1287	2022	3368	5174
65	490	847	1374	2160	3597	5527
70	521	901	1462	2298	3827	5880
75	552	955	1550	2436	4056	6232
80	584	1009	1637	2574	4286	6585
85	615	1063	1725	2711	4515	6938
90	646	1117	1813	2849	4745	7290
95	678	1171	1900	2987	4974	7643
100	709	1225	1988	3125	5204	7995
110	771	1333	2164	3401	5663	8701
120	834	1441	2339	3676	6122	9406
130	896	1550	2514	3952	6581	10111
140	959	1658	2690	4227	7040	10817
150	1021	1766	2865	4503	7499	11522
160	1084	1874	3040	4779	7958	12227
170	1146	1982	3216	5054	8417	12933
180	1209	2090	3391	5330	8876	13638
190	1271	2198	3567	5606	9335	14343
200	1334	2306	3742	5881	9794	15048
210	1397	2414	3917	6157	10253	15754
220	1459	2522	4093	6433	10712	16459
230	1522	2630	4268	6708	11171	17164
240	1584	2738	4443	6984	11630	17870
250	1647	2846	4619	7260	12089	18575
260	1709	2955	4794	7535	12548	19280
270	1772	3063	4970	7811	13007	19985
280	1834	3171	5145	8087	13467	20691
290	1897	3279	5320	8362	13926	21396
300	1959	3387	5496	8638	14385	22101

TI-P277-02-US
Issue 1

SV69L
Bronze Liquid Relief Valves
Non-ASME Coded

Description
Spirax Sarco SV69L Series Liquid Relief valves are an industry standard relief valve used for liquid applications. Engineered and designed for heavy-duty industrial usages.

Sizes from ¼" to 3", pressure to 600 psi, temperatures to 450 °F.

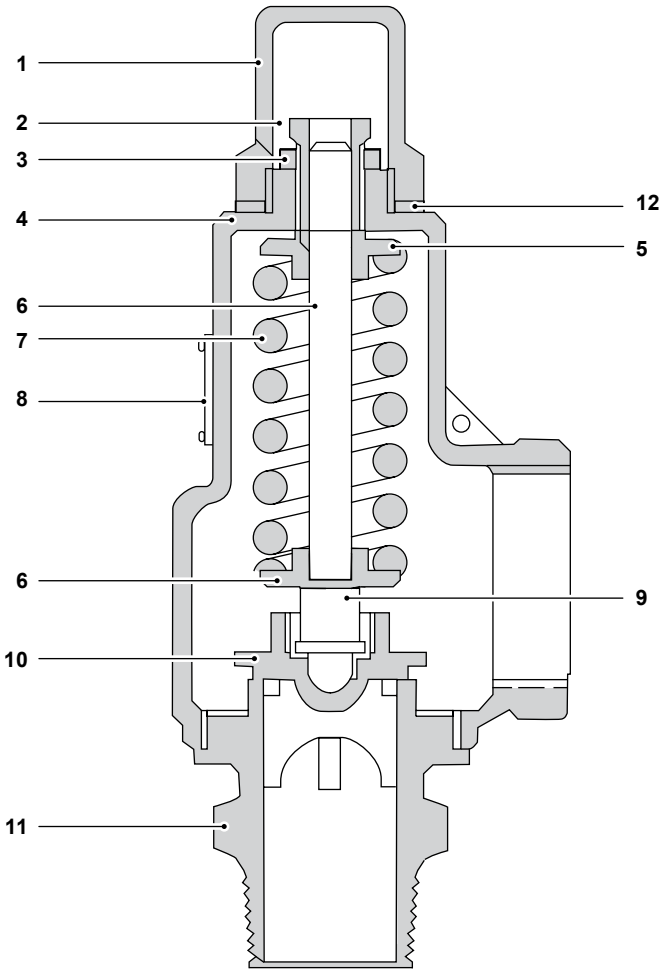
Usages
- Pressure relief, liquid relief, by-pass and over-protection
- Continuous relief
- Pressure regulation
- Pumping stations, tanks, hydraulics, fluid lines, oil fields, piping lines.



Features
- Field adjustable (Set pressure needs to be provided)
- Metal-to-metal precision lapped seating
- Sealed hex cap with O-ring teflon seal
- One piece enclosed bonnet to minimize leakage
- Back pressure tested against leakage (now standard)
- Easy to clean and maintain by simple removal of the bonnet
- 302 Stainless steel springs (STD)

Options
- Wheel handle
- Stainless steel inserts for corrosive or higher pressure protection
- Polishing and chrome plating

Materials



No.	Part	Material
1	Hood	Brass
2	Pressure Screw	Brass
3	Lock Nut	Brass
4	Bonnet	Bronze
5	Spring Plate	Brass/Steel*
6	Spring Post	Brass/Steel*
7	Spring	Stainless Steel
8	Name Plate	Aluminum
9	Spring Plate Support	Brass/Steel*
10	Disc	Bronze
11	Body	Brass/Bronze
12	Sealing Disk	Teflon

* Steel Plated

Series, valve size, outlet size, seat size and Maximum set pressure liquid

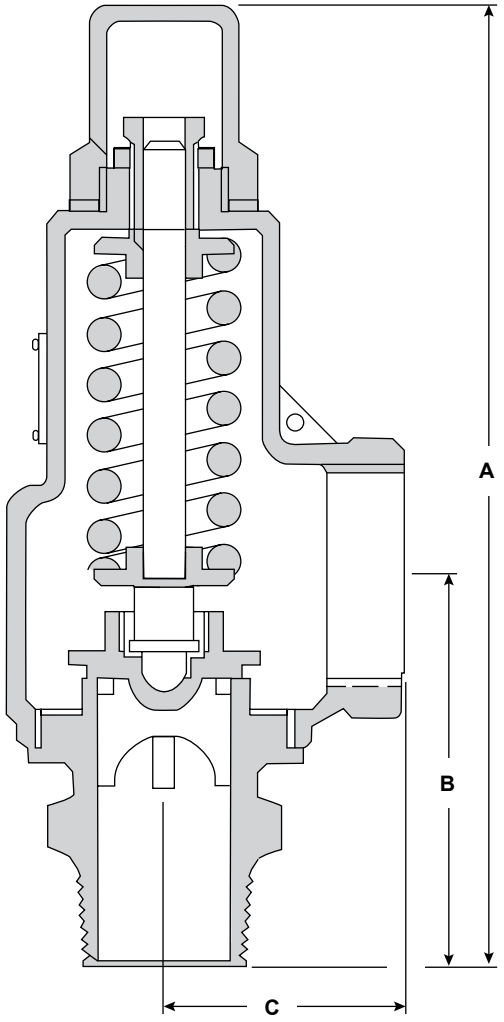
Series	Valve size	Outlet size	Seat size	Maximum set pressure liquid
69	½"	½"	½" - A	600
	½"	¾"	½" - A	
	¾"	¾"	¾" - B	
	¾"	1"	¾" - B	
	1"	1"	1" - C	
	1"	1¼"	1" - C	
	1¼"	1¼"	1¼" - D	
	1¼"	1½"	1¼" - D	
	1½"	1½"	1½" - E	
	1½"	2"	1½" - E	
	2"	2"	2" - F	
	2"	2½"	2" - F	
	2½"	2½"	2½" - G	
	2½"	3"	2½" - G	
	3"	3"	3" - H	

Dimensions/weights
(approximate) in inches and lbs

Dimensions			Weight
A	B	C	lbs
5⅞"	2⅛"	1⅜"	1.5
6"	2⅜"	1⅜"	2
7½"	2⅝"	1⅞"	3
8½"	3¼"	2"	4.5
	3½"		
9¾"	3½"	2½"	6.5
11⅛"	4"	2⅝"	9.25
12"	4¾"	3⅛"	21
			22
13½"	5⅛"	4⅜"	24

Important notes:

1. Please specify series, size, service and set pressure
2. Standard valve for liquid relief is "same sized outlet" (unless otherwise specified)
3. Stainless Steel trimming recommended for pressure settings over 400 psi g (27.6 bar g) (or for chemical reactive purposes)
4. 2½" and 3" Max set pressure 350 psi g (24.1 bar g).



Capacities - Liquid - Series 69L - Sizes ½" to 3"

Liquid capacity in gallons per minute (GPM) at 25% over pressure.

	A	B	C	D	E	F	G	H
Set pressure	½"	¾"	1"	1¼"	1½"	2"	2½"	3"
5	3.9	7.7	12	17	22	33	44	55
10	5.6	8.1	17	24	31	46	62	78
15	6.8	13	21	29	38	56	76	95
20	7.9	15	24	34	44	65	88	111
25	8.8	17	27	38	49	73	98	124
30	9.7	19	29	41	53	80	107	136
40	11	22	34	48	62	92	124	157
50	12	24	38	53	69	103	139	175
60	13	26	42	58	75	112	151	190
75	15	30	47	65	85	126	170	21
100	18	34	54	76	98	146	196	248
125	20	38	60	85	109	163	219	277
150	22	42	66	93	120	178	240	303
175	23	45	71	100	129	193	259	328
200	25	48	76	107	138	206	277	350
225	26	51	80	113	146	218	293	371
250	28	54	85	120	154	230	310	392
275	29	56	89	125	161	240	325	410
300	31	59	93	131	169	252	340	429
325	32	61	97	136	176	262		
350	33	64	101	141	183	272		
375	34	66	104	146	189	281		
400	35	68	108	151	195	291		
425	36	70	112	156	201	302		
450	37	72	115	162	208	314		
475	38	75	119	167	215	326		
500	39	77	1123	171	221	337		
525	40	79	126	176	227	348		
550	41	81	130	180	234	359		
575	42	83	134	185	240	371		
600	43	86	138	189	247	383		

Notes:
1. Stainless steel trim package recommended for pressure settings over 400 psi g (27.6 bar g) (disk and seat insert)
2. Liters per minute = GPM x 3.785
3. Bar = psi g x .06895

CONDENSATE RECOVERY SOLUTIONS



Section contents ⟩

spirax sarco

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SECTION 5 CONTENTS

Non-Electric Pumps	The Pivotrol® Pump Patented PTC Pressure Powered Pump	TI-P207-05-US
	The Pivotrol® Pump Patented PTF ASME Code Stamped Pressure Powered Pump	TI-P207-06-US
	The Pivotrol® Pump Patented PTF-HP Pressure Powered Pump	TI-P207-07-US
	The Pivotrol® Pump Patented PTF-HTF Pressure Powered Pump	TI-P207-11-US
	The Pivotrol® Pump Patented PTF4 (High Capacity) Pressure Powered Pump	TI-P207-10-US
	The Pivotrol® Pump Patented Selection and Sizing	TI-P207-12-US
	The Pivotrol® Pump Patented Digital Cycle Counter	TI-P207-08-US
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	APT10 and APT10SS Automatic Pump Traps	TI-P612-28-EN
	APT14, APT14HC, and APT14SHC Automatic Pump Trap	TI-P612-02-EN
	APT Selection & Sizing	TI-S27-02-US
	Simplex / Duplex / Triplex / Quadraplex Vented Pressure Powered Pump Packages PPEC/PTC/PTF	TI-P208-01-US
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SECTION 5 CONTENTS
(CONTINUED)

Electric Pumps	Flash Recovery Vessels	TI-P140-01-US
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	Pump Dimensions "V" Series	TI-P540-03-US
	Pump Sizing Selection Tables "V" Series	TI-P215-03-US
	Control Panels 550 Series and 700 Series	TI-P216-04-US
	SSCRU Series Stainless Steel Electric Condensate Pumps	TI-P216-02-US
	SSCRU Series Control Panels	TI-P216-01-US

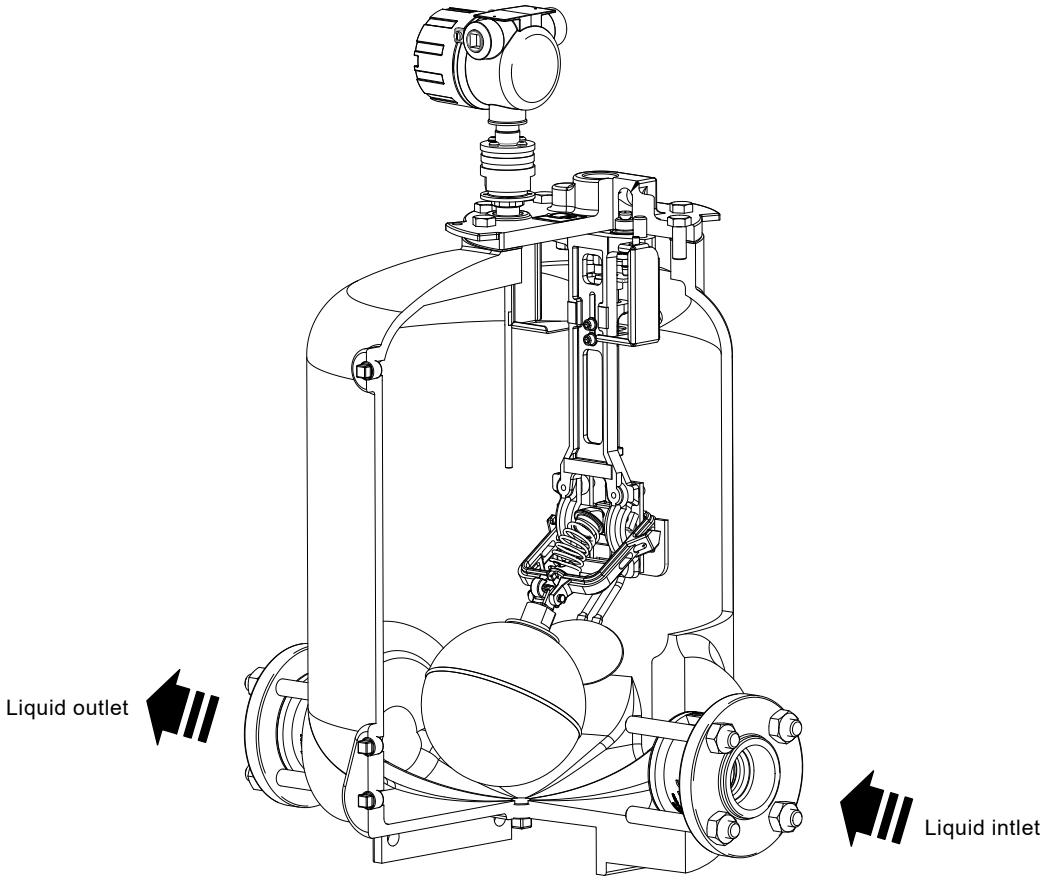
TI-P207-05-US
Issue 3

The Pivotrol® Pump Patented PTC Pressure Powered Pump

Description

The Spirax Sarco Pivotrol® Pump (patented) is a non electric pump which transfers high temperature condensate, or other liquids from a low point, low pressure or vacuum space to an area of higher pressure or elevation. This self-contained unit including PowerPivot® technology (patented) uses steam, compressed air or any other suitable pressurized gas as the pumping force. The standard Pivotrol® Pump (patented) will handle liquids from 0.9 to 1.0 specific gravity.

Model	PTC	PTC-T-bone
PMO	200 psi g (13.8 bar g)	
Sizes	2" x 2" (DN50 x DN50) 3" x 2" (DN80 x DN50)	3" x 3" (DN80 x DN80)
Connections	Cover: NPT Liquid: ANSI 150/NPT	
Construction	Ductile Iron	
Warranty	3 million cycles or 5-year warranty, whichever number is achieved first. Lifetime warranty on spring	
Options	Pump modified to handle liquids down to 0.65 specific gravity	



Accessories

- Gauge glass with brass cocks.
- Reflex type gauge glass -Insulation cover.

Operating characteristics

Pump discharge per cycle	7.1 gal (27.0 l) Nominal
Average instantaneous discharge rate	See TI-P207-10-US
Steam	3 lbs (1.4 kg) per 1000 lbs (453.6 kg) of liquid pumped
Air consumption	60 scf per 1000 lbs (453.6 kg) of liquid pumped

For increased service life — Operate pump with motive pressure 15-20 psi g (1.0 -1.4 bar g) above pump back pressure.

Limiting operating conditions

PMO	200 psi g (13.8 bar g)
Maximum operating pressure	
Minimum motive differential required:	5 psi g (0.34 bar g)

Filling head requirements			**Filling height**
Filling head		**Above pump cover**	**From base of pump**
Standard recommended		12" (305 mm)	36.9" (937 mm)
Maximum filling head		48" (1219 mm)	72.9" (1852 mm)
Minimum filling head	2x2 (DN50 x DN50)	-3" (-76 mm)	21.9" (556 mm)
	3x2 (DN80 x DN50)	-1" (-25 mm)	23.9" (607 mm)
T-Bone	3x3 (DN80 x DN80)	-1" (-25 mm)	23.9" (607 mm)
Max Number of Cycles per minute = 6			
Specific gravity of pumped liquid options = **0.9 to 1.0; 0.8 to 0.89; 0.65 to 0.79**			

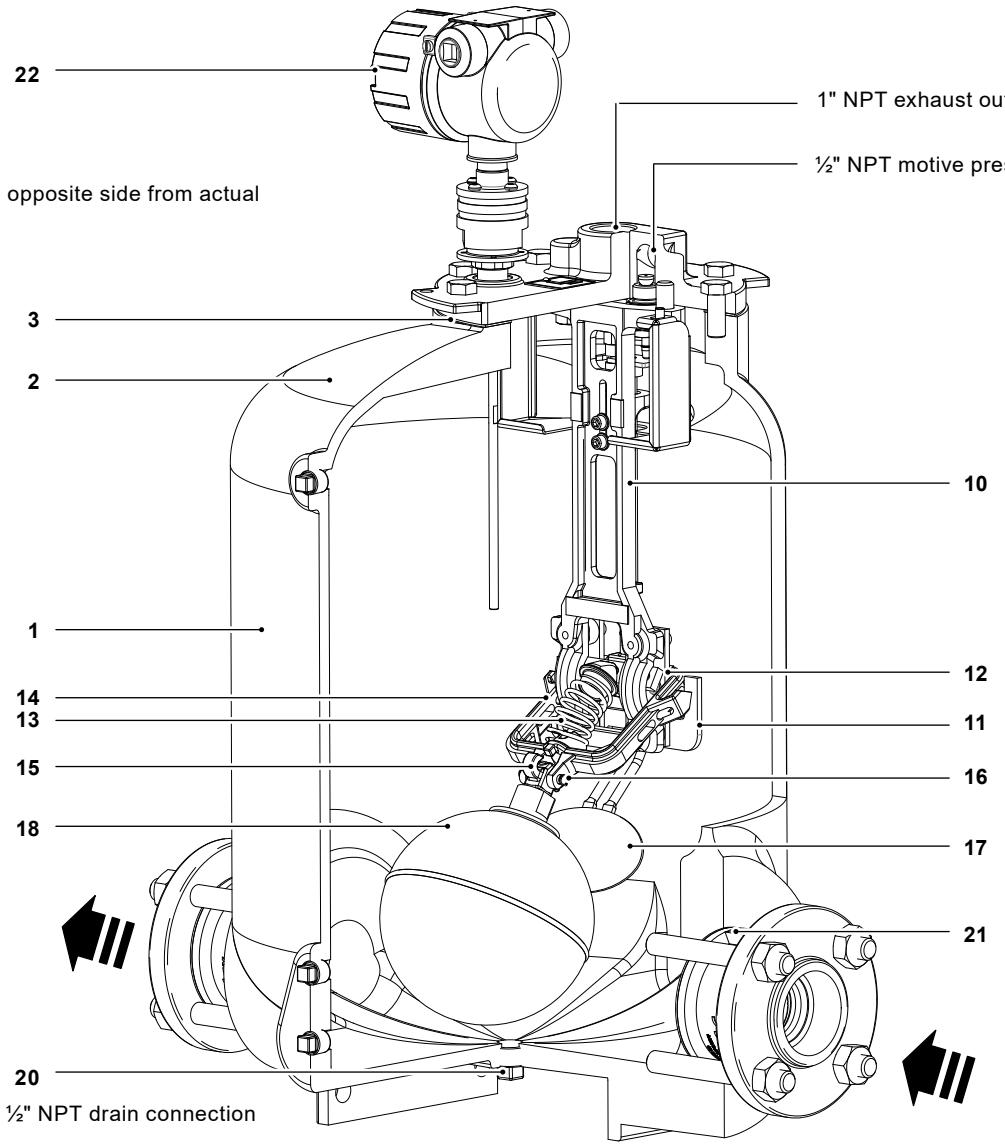
Product is safe for use under full vacuum conditions.

Note: See TI-P207-08-US for cycle counter details

Pressure shell design conditions

PMA	Maximum allowable pressure	200 psi g @ 388 °F	(13.8 bar g @ 198 °C)
TMA	Maximum allowable temperature	650 °F @ 124 psi g	(343 °C @ 8.56 bar g)

Materials

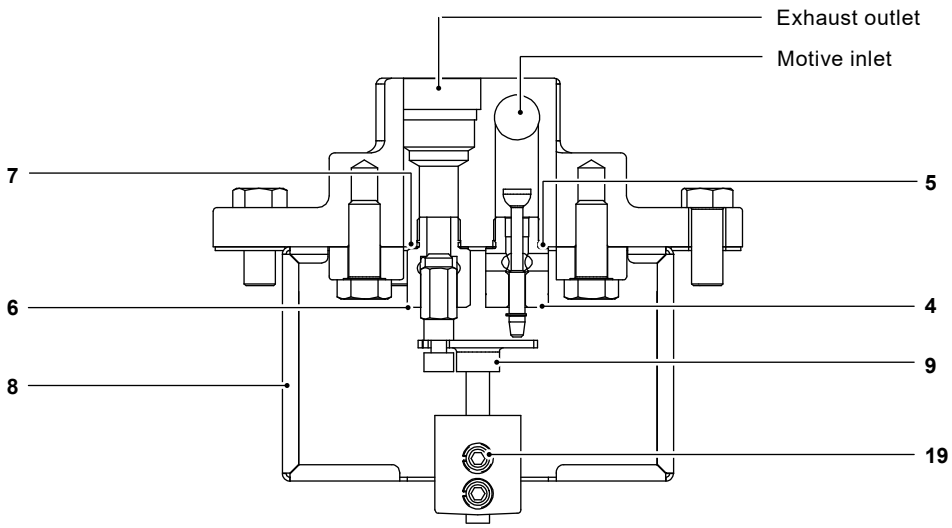


No.	Material	
1	Ductile Iron	ASTM A395
2	Ductile Iron	ASTM A395
3	Grafoil	
4	Stainless steel	
5	Stainless steel	
6	Stainless steel	
7	Stainless steel	
8	Stainless steel	
9	Stainless steel	
10	Stainless steel	
11	Stainless steel carbide	

No.	Material
12	Carbide
13	Inconel
14	Stainless steel carbide
15	Stainless steel
16	Stainless steel
17	Stainless steel
18	Stainless steel
20	Forged Steel
21	Stainless steel (see TI-P154-10-US)
22	Various (see TI-P207-08-US)

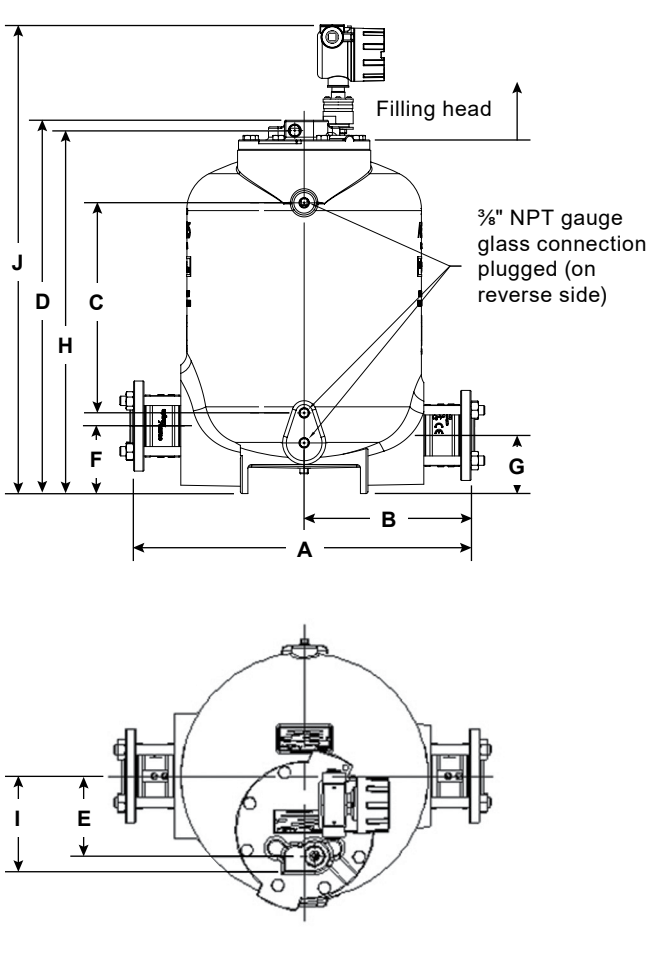
Materials continued on next page

Materials

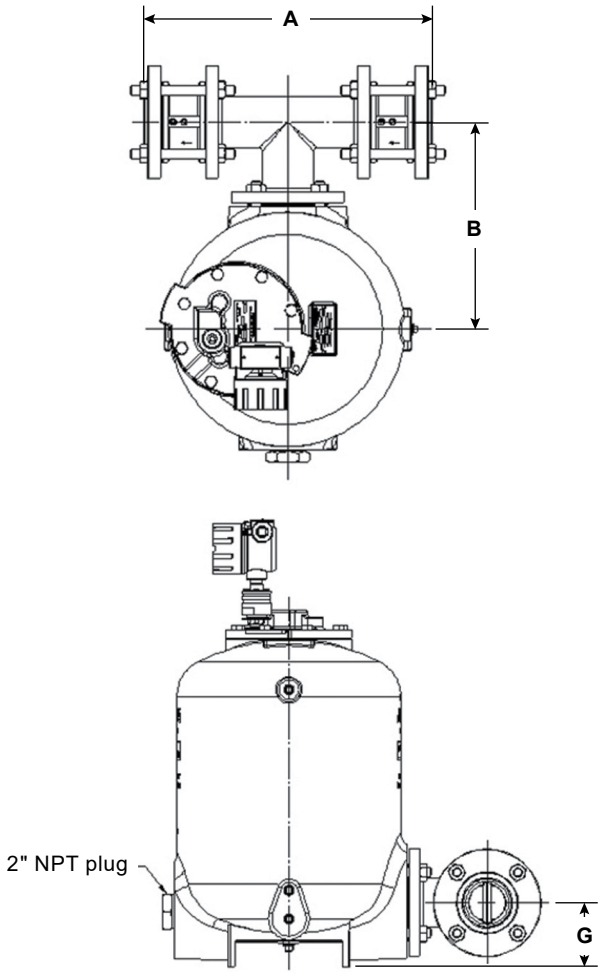


No.	Part	Material
4	Steam Inlet Valve Assembly	Stainless steel
5	Steam Inlet Valve Gasket	Stainless steel
6	Exhaust Valve Assembly	Stainless steel
7	Exhaust Valve Gasket	Stainless steel
8	Baffle	Stainless steel
9	Push Rod Assembly	Stainless steel
19	Screws (typical)	Stainless steel

Dimensions/weights (approximate) in inches (*mm*) and lbs (*kg*)



PTC



PTC T-Bone

PTC Size	Dimensions A	B	C	D	E	F	G	H*	I	J (Ref Only)	Weight Pump
2" (DN50) PTC with stainless steel Check Valves	23.3 (592)	11.3 (287)	14 (356)	24.9 (632)	5.1 (130)	4.5 (114)	3.9 (99)	24.2 (615)	6.1 (155)	31.6 (803)	260 lb (118 kg)
3" (DN80)x 2" (DN50) PTC with stainless steel Check Valves	23.9 (607)										270 lb (122 kg)
PTC w/T-Bone 3" (DN80) x 3" (DN80) with stainless steel Check Valves	19.2 (488)	13.8 (351)	14 (356)	24.9 (632)	5.1 (130)	N/A	4.5 (114)	24.2 (615)	6.1 (155)	31.6 (803)	280 lb (127 kg)

* H Dimension is to the centerline of the motive supply inlet.

Capacities
For sizing and selection data, see TI-P207-10-US.

Sample specification
The pump shall be Spirax Sarco Pivotrol® Pump (patented) operated by steam, compressed air or other pressurized gas to 200 psi g (13.8 bar g), which does not require any electrical energy.
The pump shall have Stainless steel, split disc check valves on the inlet and outlet connections. The pump shall contain Spirax Sarco PowerPivot® (patented) inside to ensure longevity and reliability of the pump.

The Pivotrol® Pump (patented) shall include an Inconel spring with a lifetime warranty and be supplied with an integral cycle counter to monitor a 3 million cycle or 5-year warranty, which ever number is achieved first.

When required the pump shall be supplied with a gauge glass and custom designed insulation jacket.

Installation
Full details are given in IM-5-201-US, which accompanies the product.

Maintenance
Complete installation and maintenance instructions are given in IM-5-201-US which accompanies the product.

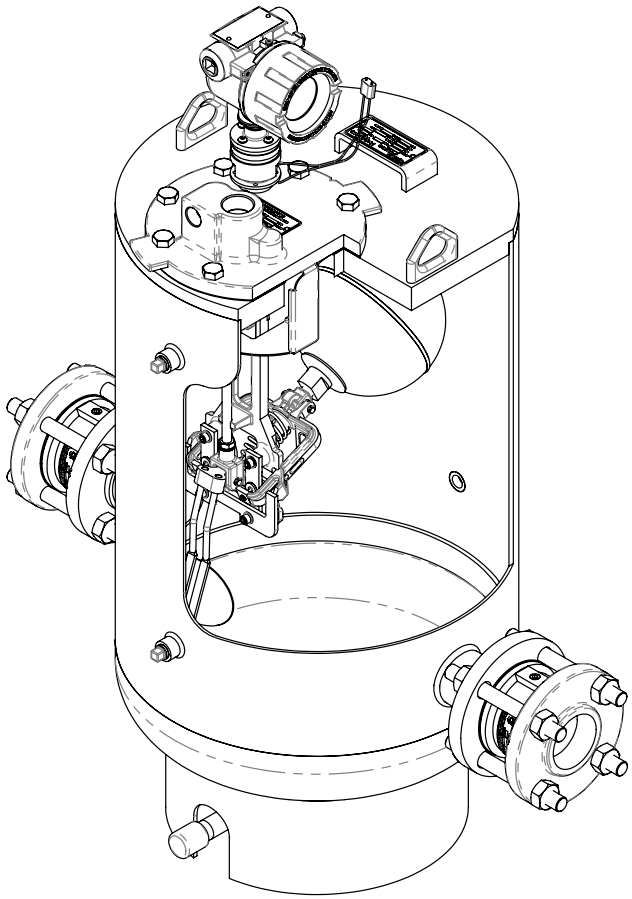
TI-P207-06-US
Issue 4

The Pivotrol® Pump Patented PTF Pressure Powered Pump Series

Description

The Spirax Sarco Pivotrol® Pump (patented) is a non electric pump which transfers high temperature condensate, or other liquids from a low point, low pressure or vacuum space to an area of higher pressure or elevation. This self-contained unit including PowerPivot® technology (patented) uses steam, compressed air or any other suitable pressurized gas as the pumping force. The standard Pivotrol® Pump (patented) will handle liquids from 0.9 to 1.0 specific gravity.
Suitable for use in hazardous environments and volatile fluid pumping applications. See IM-5-201-US for full details.

Model	PTF	PTF - Stainless steel	PTF - Top Inlet	PTF - T-Bone
PMO	200 psi g (13.8 bar g)			
Sizes	2" x 2" (DN50 x DN50) 3" x 2" (DN80 x DN50)		3" x 3"	
Connections	Cover: NPT Liquid: ANSI 150/NPT			
Construction	Fabricated Steel Body ASME Code Stamped			
Warranty	3 Million Cycles or 5 Year Warranty, whichever number is achieved first. Lifetime Warranty on Spring			
Options	Pump modified to handle liquids down to 0.65 specific gravity, gauge glass reflex			



Accessories

- Gauge glass with brass cocks.
- Reflex type gauge glass -Insulation cover.

Operating characteristics

Pump discharge per cycle : 8.4 gal (31.8 l) Nominal

Average instantaneous discharge rate : 90 gpm (5.7 l/s)

Average Steam Consumption : 3 lbs (1.4 kg) per 1000 lbs (453.6 kg) of liquid pumped

Average Air Consumption : 60 SCF per 1000 lbs (453.6 kg) of liquid pumped

Filling head recommended above the pump cover is 12" (305 mm).

For increased service life - Operate pump with motive pressure 15-20 psi g (1.0-1.4 bar g) above pump back pressure.

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Limiting operating conditions

PMO	200 psi g (13.8 bar g)
Maximum operating pressure	
Minimum motive differential required:	5 psi g (0.34 bar g)

Filling head requirements			**Filling height**
Filling head		**Above pump cover**	**From base of pump**
Standard recommended		12" (305 mm)	36.9" (937 mm)
Maximum filling head	PTF	48" (1219 mm)	78.8" (2002 mm)
Minimum filling head	PTF 2x2 (DN50 x DN50)	-3" (-76 mm)	27.8" (706 mm)
	PTF 3x2 (DN80 x DN50)	-1" (-25 mm)	29.8" (757 mm)
	PTF-Top	39" (991 mm)	78.8" (2002 mm)
	PTF-Top	12" (305 mm)	52.9" (1344 mm)

Max Number of Cycles per minute = 6

Specific gravity of pumped liquid options = **0.9 to 1.0; 0.8 to 0.89; 0.65 to 0.79**

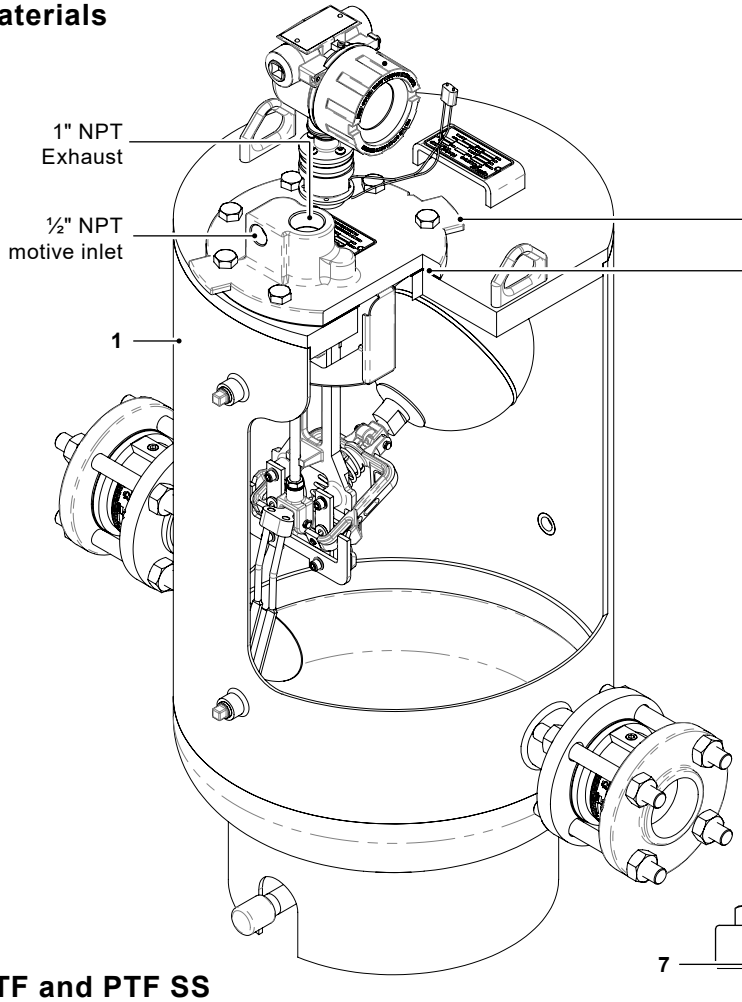
Product is safe for use under full vacuum conditions.

Pressure shell design conditions

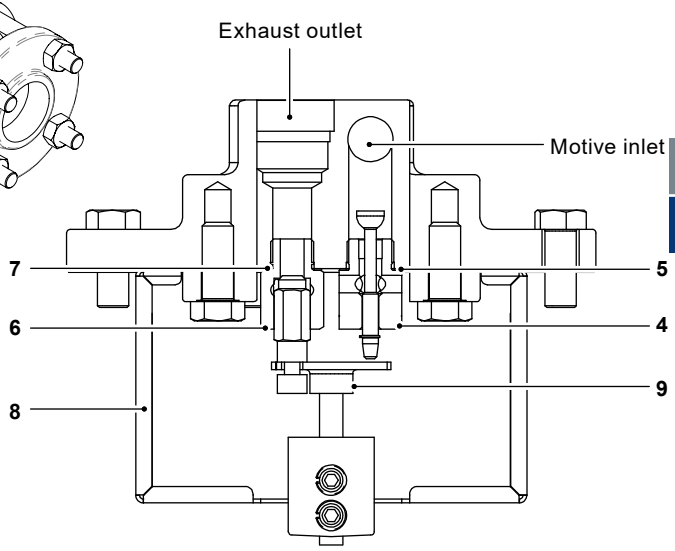
PMA	Maximum allowable pressure	200 psi g @ 388 °F	(13.8 bar g @ 198 °C)
TMA	Maximum allowable temperature	388 °F @ 200 psi g	(198 °C @ 13.8 bar g)
		650 °F @ 124 psi g	(343 °C @ 8.55 bar g)

Consult the factory for pressure/temperature rating with reflex gauge glass

Materials



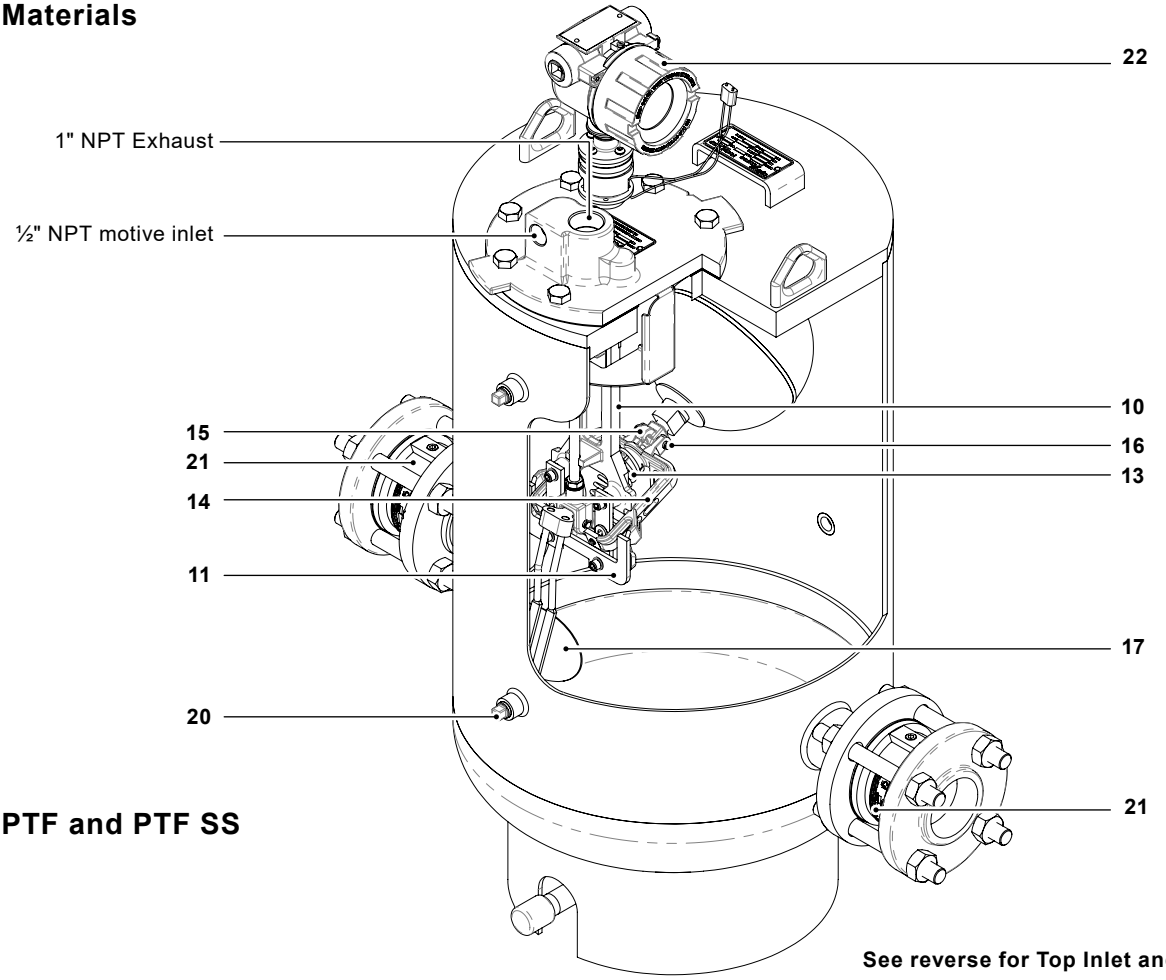
See reverse for Top Inlet and T-Bone views



PTF and PTF SS

No.	Part	Material	
1	Body	PTF - Fabricated Steel	ASME Coded
		PTF Top: Fabricated Steel	ASME Coded
		PTF SS: Fabricated Stainless steel	ASME Coded
2	Cover	PTF - Cast Steel	ASTM SA216WCB
		PTF Top: Cast Steel	ASTM 216WCB
		PTF SS: Cast Stainless steel	ASTM A351 CF8M
3	Cover Gasket	Grafoil	
4	Steam Inlet Valve Assembly	Stainless steel	
5	Steam Inlet Valve Gasket	Stainless steel	
6	Exhaust Valve Assembly	Stainless steel	
7	Exhaust Valve Gasket	Stainless steel	
8	Baffle	Stainless steel	
9	Push Rod Assembly	Stainless steel	

Materials



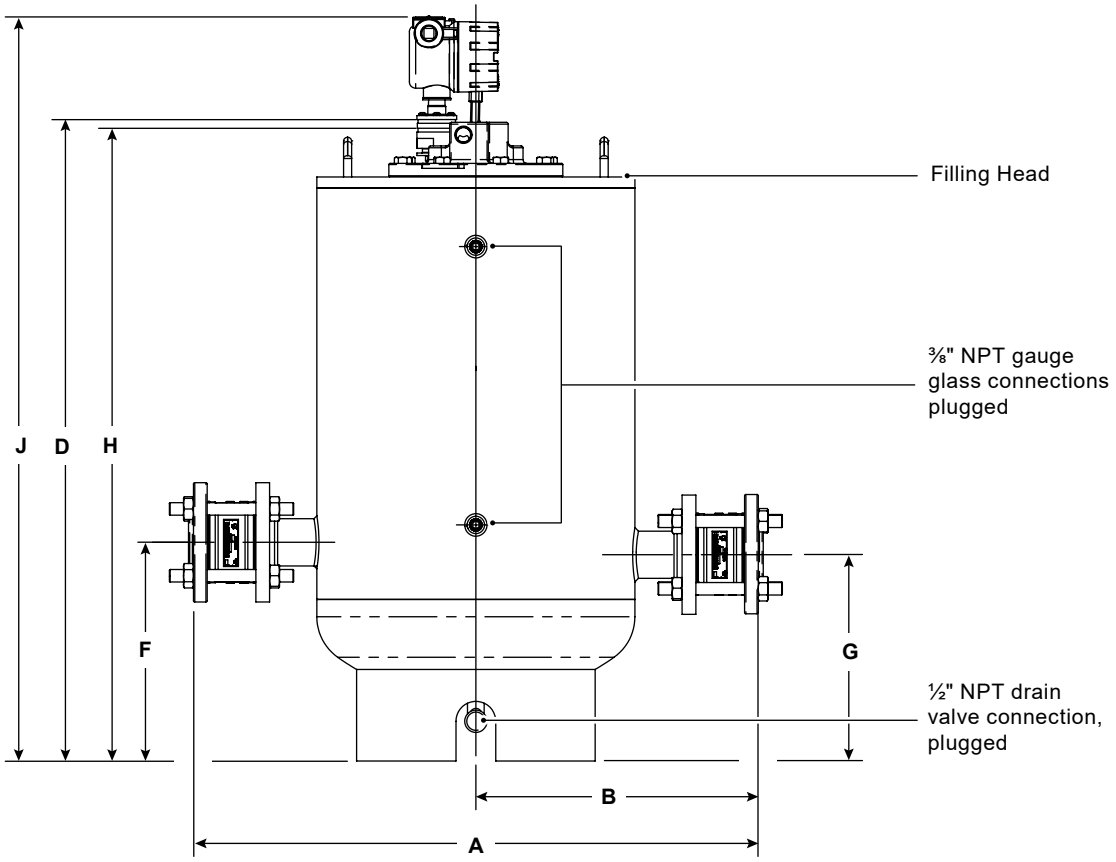
PTF and PTF SS

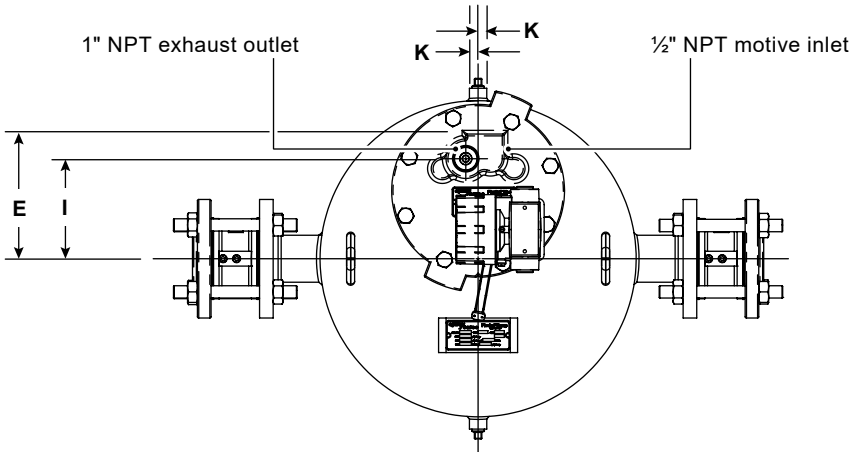
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See reverse for Top Inlet and T-Bone views

No.	Part	Material
10	Mechanism Support	Stainless steel
11	Bushing Mounting Plate (Bushings)	Stainless steel Carbide
12	Spring Anchor (Not shown in this view)	Carbide
13	Spring	Inconel
14	Float Arm Assembly (Pivots)	Stainless steel Carbide
15	Float Pivot	Stainless steel
16	Pin	Stainless steel
17	Paddle	Stainless steel
18	Float	Stainless steel
19	Screws (typical)	Stainless steel
20	Plugs (typical)	Forged Steel
21	Check Valves (SDCV44)	Stainless steel (see TI-P154-10-US)
22	Cycle Counter	Various (see TI-P207-08-US)

PTF and PTF SS - Dimensions/weights (approximate) in inches (mm) and lbs (kg)





Size	Dimensions															Weight
	A	B	C	D	E	F	G	H*	I	J	K	L	M	N	O	Pump
2" (DN50) PTF-SS Check Valves	29.2 (742)	14.4 (366)	14 (356)	32.1 (815)	5.1 (130)	11 (279)	10.4 (264)	31.5 (800)	6.3 (160)	37.3 947)	0.6 (15)	N/A	N/A	N/A	N/A	210 lb (95 kg)
3" x 2" (DN80xDN50) PTF-SS Check Valves	30.2 (767)															

* H Dimension is to the centerline of the motive supply inlet.