

# Stainless Steel Specialty Products

For the efficient control and conditioning  
of clean steam, condensate  
and process fluids



**spirax**  
**/sarco**

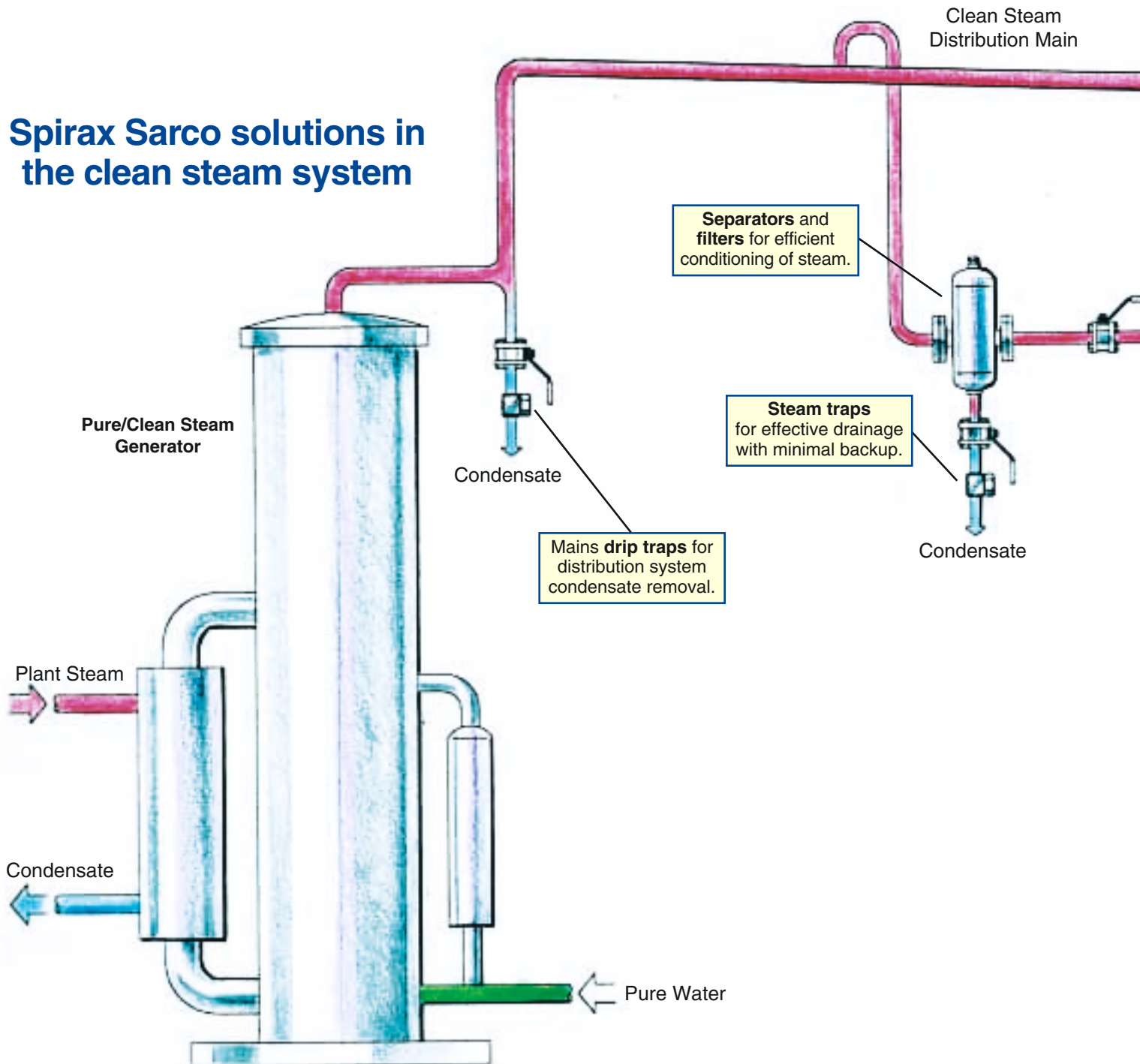
# Maintaining quality and purity of a clean steam system is an essential ingredient to product excellence

The use of clean or pure steam to reduce the risk of product or process contamination spans many industries and applications, including:

- Pure steam for sterilization of equipment in the biotechnology and pharmaceutical industries
- Culinary steam for direct cooking and heating of foods
- Clean steam for humidification of clean rooms
- Filtered steam for hospital sterilizers

For all these uses, Spirax Sarco offers a range of products and services to help optimize system performance and ensure product excellence.

## Spirax Sarco solutions in the clean steam system

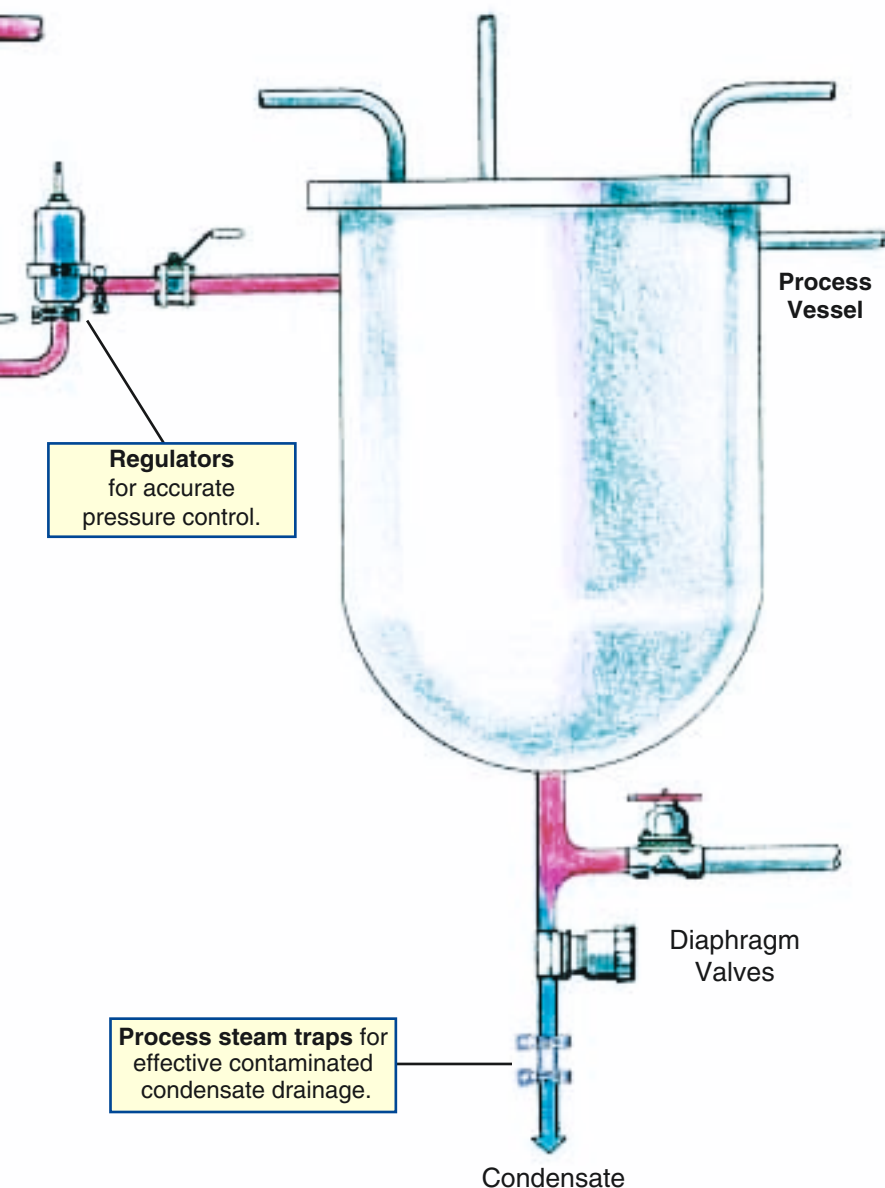


## The need for stainless steel specialty products

Efficient design of clean steam systems and correct component selection prevents:

- Expensive product loss
- Back-up of condensate, with subsequent product and system contamination
- Excessive corrosion and rouging of the steam and process systems
- Ineffective condensate removal and control
- Reduced process system efficiency
- High maintenance costs

All too often, these problems are just accepted simply because no readily available solution exists.

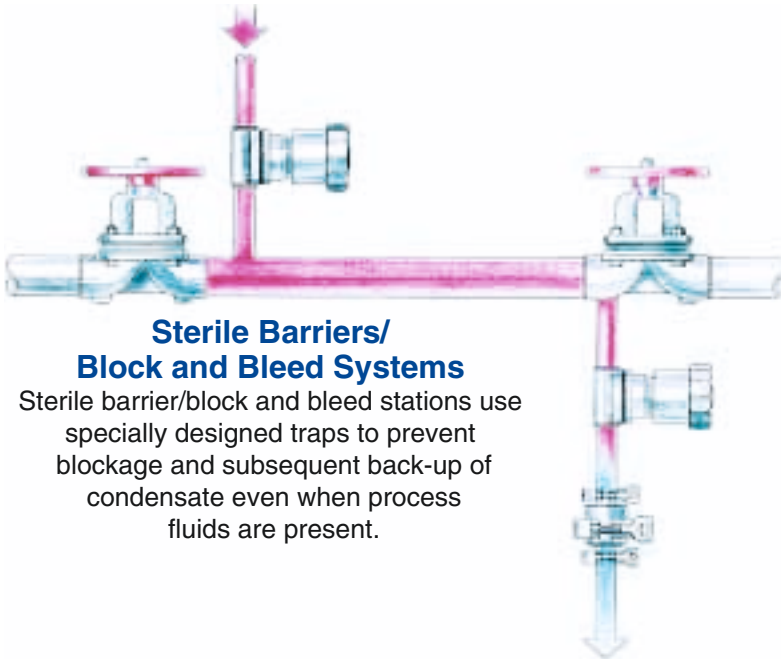


### User benefits

- Single source supplier for clean steam needs.
- Stainless steel construction for long life and reduced contamination risk.
- Sanitary designs for the more critical process applications, minimizing biocontamination and increasing productivity.
- Wide range of end connections, compatible with sanitary tubing and piping systems.
- Compact designs, convenient for reduced space requirements.
- Reduced maintenance costs.
- Improved product quality with minimized risk of contamination and loss.
- Effective control of clean and pure steam, condensate, and other high purity fluids.
- Reduced environmental emissions due to effective steam trapping.

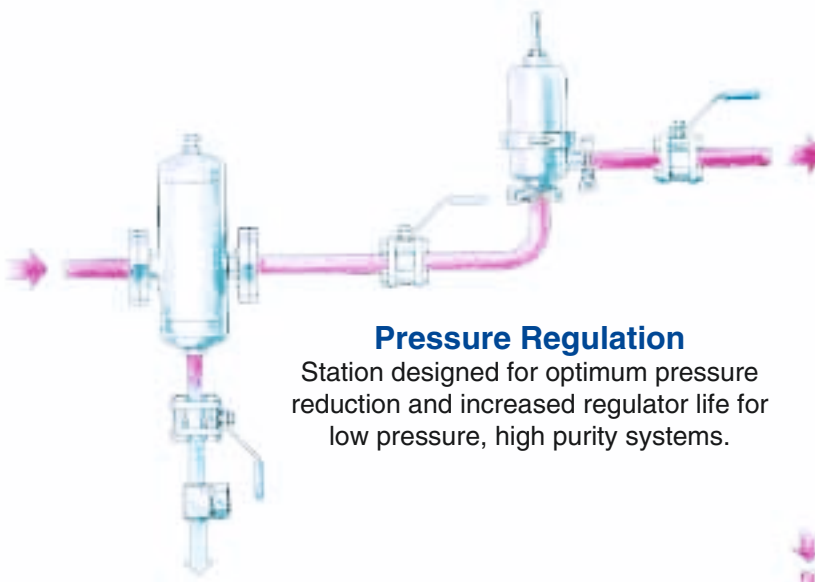
**Note:** All diagrams contained in this brochure are schematic representations only—not to be used for construction.

# Typical applications for stain



## Sterile Barriers/ Block and Bleed Systems

Sterile barrier/block and bleed stations use specially designed traps to prevent blockage and subsequent back-up of condensate even when process fluids are present.

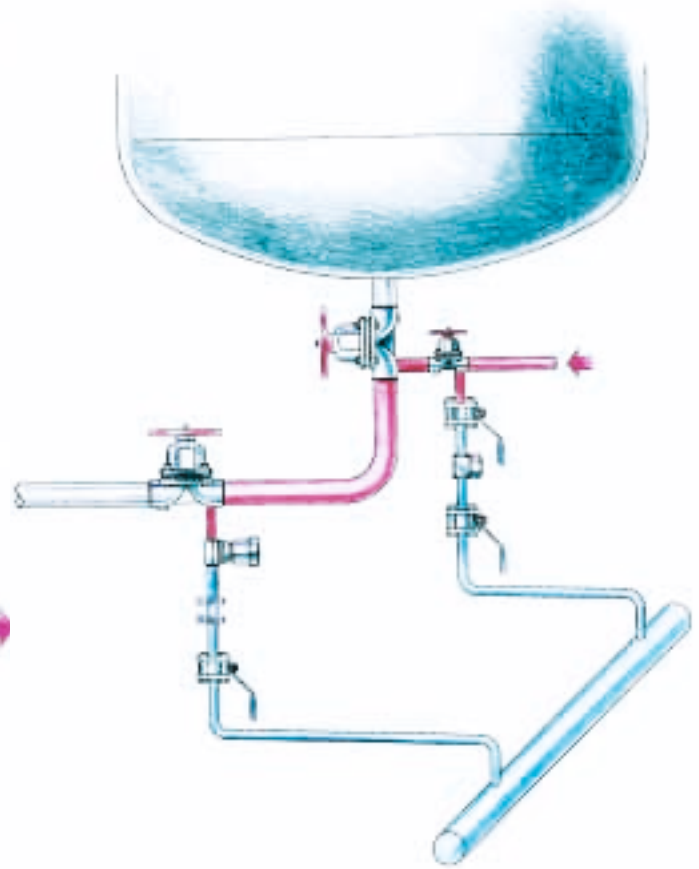


## Pressure Regulation

Station designed for optimum pressure reduction and increased regulator life for low pressure, high purity systems.

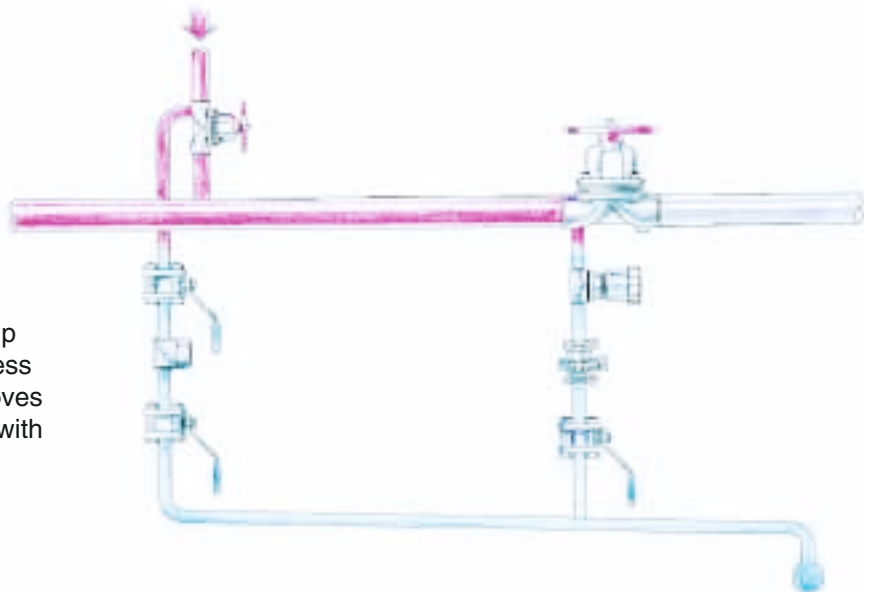
## Effective Condensate Drainage

Bioreactor/tank outlet and sterile barrier creates effective condensate drainage during both routine sterilization and sterile barrier operations.

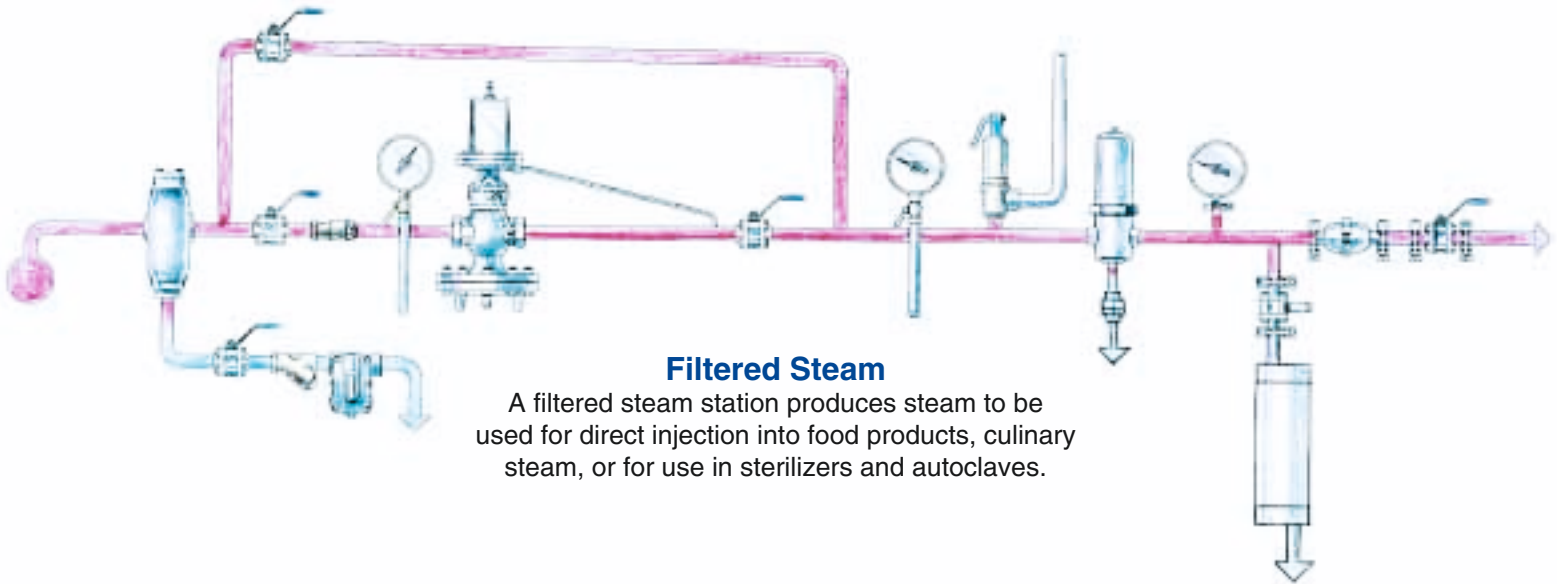


## Process Piping Sterilization with Mains Drip

Sterilization of process piping/mains drip provides clean, saturated steam to process piping for sterilization and efficiently removes condensate which may be contaminated with process fluids and/or CIP solutions.

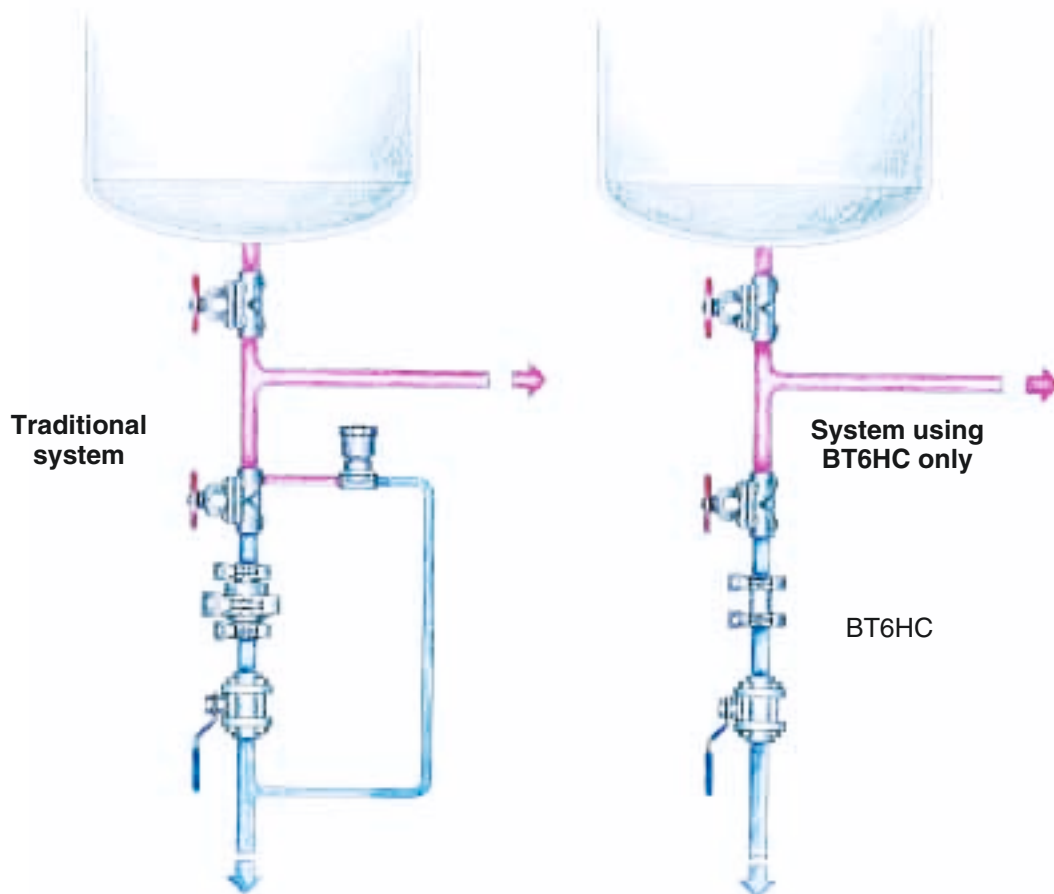


# less steel specialty products



## Filtered Steam

A filtered steam station produces steam to be used for direct injection into food products, culinary steam, or for use in sterilizers and autoclaves.



## CIP/SIP Systems

Many installed CIP/SIP systems use a manual/automated by-pass system with relatively low capacity steam traps to control the flow of cleaning fluid and condensate.

It can be seen from the above diagrams that there are significant pipework savings when using a BT6HC instead of the traditional system.

The BT6HC can be used on a variety of applications within clean steam and hygienic systems. Its high cold capacity makes it an excellent choice for joint CIP/SIP systems and also for drainage of large process vessels where initial condensate and air volumes are very high but normal running loads are low.

# Steam Traps

A complete range of stainless steel traps are available from Spirax Sarco to suit all applications and operating environments. Manufactured in the highest quality corrosion resistant 316L stainless steel materials, Thermostatic and Thermo-Dynamic® traps can be supplied with a wide range of end connections for use in either tubing or piping systems.

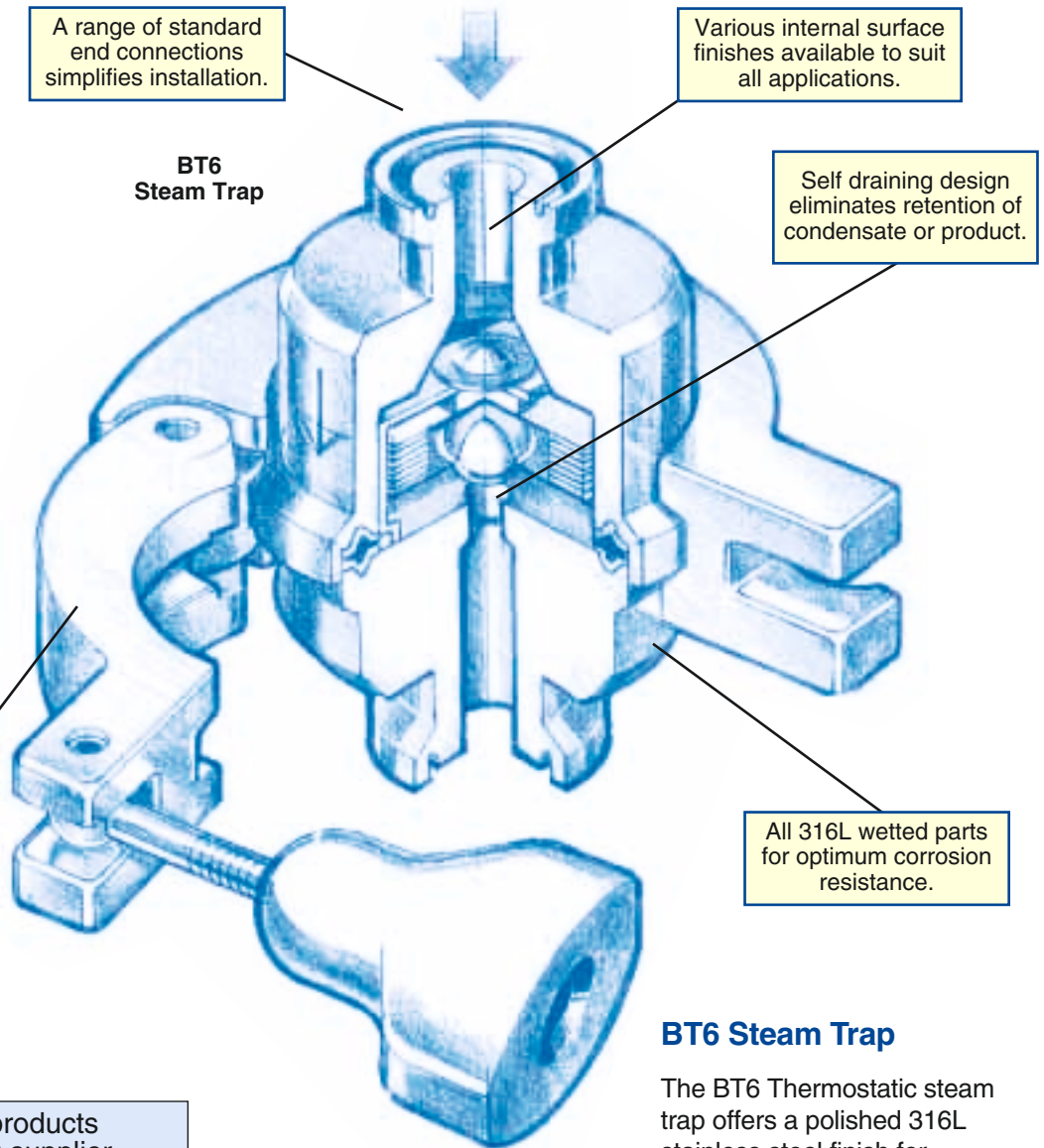
## Thermostatic Traps

Thermostatic traps are most widely used in process applications, as they can be designed to be free draining and operate close to steam temperature at any given pressure. A large orifice helps eliminate the possibility of fouling in the presence of contaminated condensate or cleaning solutions, while minimal condensate retention and excellent air venting capabilities associated with thermostatic traps ensure rapid heat-up and optimum sterilization.

## Thermo-Dynamic® Traps

Thermo-Dynamic® traps are more suited to constant pressure applications, where small amounts of uncontaminated condensate are present, such as in steam main drainage applications.

Whatever the application, Spirax Sarco has a wide range of trap products available for use in both Clean Steam and Process Systems.



## BT6 Steam Trap

The BT6 Thermostatic steam trap offers a polished 316L stainless steel finish for maximum corrosion resistance. Quick release Tri-Clamp® compatible end connections and center body clamp assures ease of maintenance, reduces downtime and provides compatibility with other process system components. Typical applications for the BT6 include sterile barriers, process vessel sterilization, and CIP/SIP systems. The BT6 is available with actual material certification as standard.

## Typical Applications

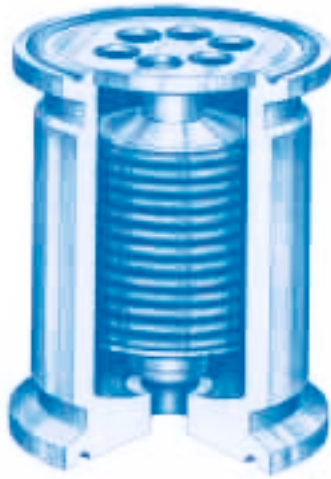
- Fermentors
- Bioreactors
- Sterilizers/Autoclaves
- CIP/SIP Systems
- Process Piping
- Equipment Sterilization
- Block & Bleed
- Sterile Barriers

## User benefits

- Complete range of clean steam products available from the world's leading supplier.
- Products designed specifically for clean steam and process systems ensures optimum system integrity.
- Various end connection configurations allow simple installation in both tubing and piping systems.
- Compact elements common to thermostatic trap range for simplified maintenance and reduced spares inventories.
- High levels of surface finish as standard helps eliminate the possibility of product fouling.
- Actual material certification available on certain trap models.

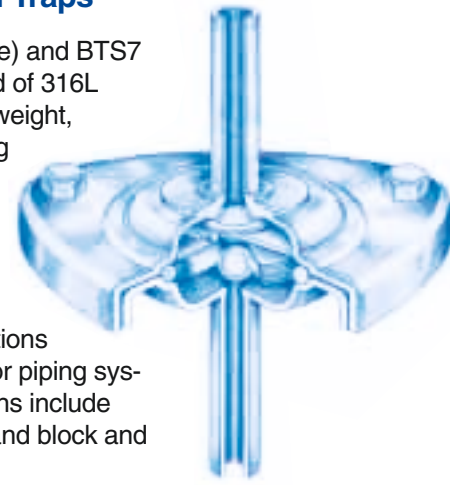
## BT6HC Steam Trap

The BT6HC is a high capacity process thermostatic steam trap of all polished 316L stainless steel construction. Tri-Clamp compatible end connections and a two-piece design assures ease of installation and maintenance. Specially designed for CIP/SIP systems, the trap handles CIP solutions, high condensate loads, and large amounts of air while simplifying the pipework design.



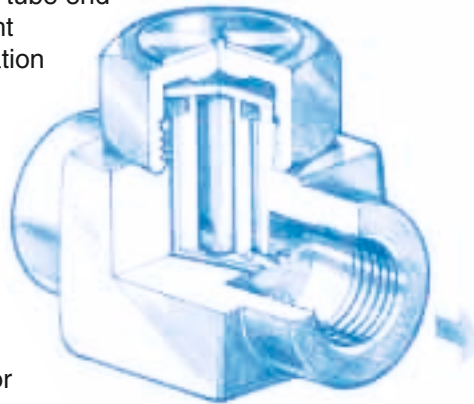
## BTM7/BTS7 Steam Traps

The BTM7 (maintainable) and BTS7 (sealed) are constructed of 316L stainless steel in a lightweight, compact design allowing easy installation at low initial cost. The BTM7 and BTS7 are available with screwed, extended tube end, or Tri Clamp® compatible end connections for use in either tubing or piping systems. Typical applications include sterilizers, autoclaves, and block and bleed systems.



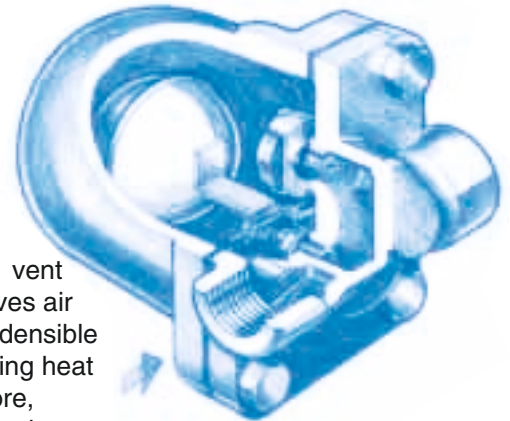
## BTD52L Steam Trap

The compact BTD52L Thermo-Dynamic® steam trap is available in a wide range of sizes with screwed, Tri-Clamp® compatible or extended tube end connections. Clean, tight shut-off at steam saturation temperature without a water seal eliminates waste of valuable clean steam. Typical applications include mains drainage, and in-line filter sterilization. Actual material certification is available as standard for the BTD52L tube end and Tri-Clamp® compatible versions.



## FT16 /FT46 Steam Trap

The FT16 and FT46 are high capacity traps designed for applications requiring continuous drainage of high condensate loads in clean steam systems. These float and thermostatic traps prevent back-up and maximize process efficiency. A thermostatic air vent efficiently removes air and other incondensable gases, maximizing heat transfer; therefore, reducing heat up times.



	<b>BT6HC</b>	<b>BT6</b>	<b>BTM7/BTS7</b>	<b>BTD52L</b>	<b>FT16</b>	<b>FT46</b>
Sizes	1", 1½"	½", ¾", 1"	¼", ½", ¾", 1"	¼", ⅜", ½"	½", ¾"	½", ¾", 1", 1-½", 2"
Construction	316L stainless steel body and internals Internal body finish – 32 microinch Ra	316L stainless steel body and internals Internal body finish – 8-32 microinch Ra	316L stainless steel body and internals	316L stainless steel	316L stainless steel body, stainless steel internals	
Connections	Tri-Clamp® compatible	Tri-Clamp® compatible	0.065" extended O.D. Tube (½", ¾", 1" only), NPT, or Tri-Clamp® compatible (½", ¾", 1" BTM7 only)	0.065" extended O.D. Tube (½" only) NPT, or Tri-Clamp® compatible (½" only)	NPT	ANSI 300,150
Maximum Operating Pressure	87 psig	88 psig	102 psig	150 psig	FT16/46-4.5: 65 psig FT16/46-10: 145 psig FT16/46-14: 200 psig	FT46-21: 300 psig
Maximum Operating Temperature	Saturated steam temperature	Saturated steam temperature		850°F	45°F of superheat at all operating pressures	
Options	N/A	Fixed bleed, Other connections are available upon request		BSP connections, Insulcap	3/8" NPT drain plug	
TIS #	2.015	2.000	2.0002	2.518	2.318	2.319

# Pressure Regulators

In order to overcome steam main heat losses, reduce the pipework size, and ensure optimum generation efficiency, pressure in a system is normally higher than that required by individual user equipment.

To satisfy the requirements of these users, a pressure regulator must be used to reduce pressure either within the distribution system, or at each point of use.

## The SRV6 Pressure Regulator

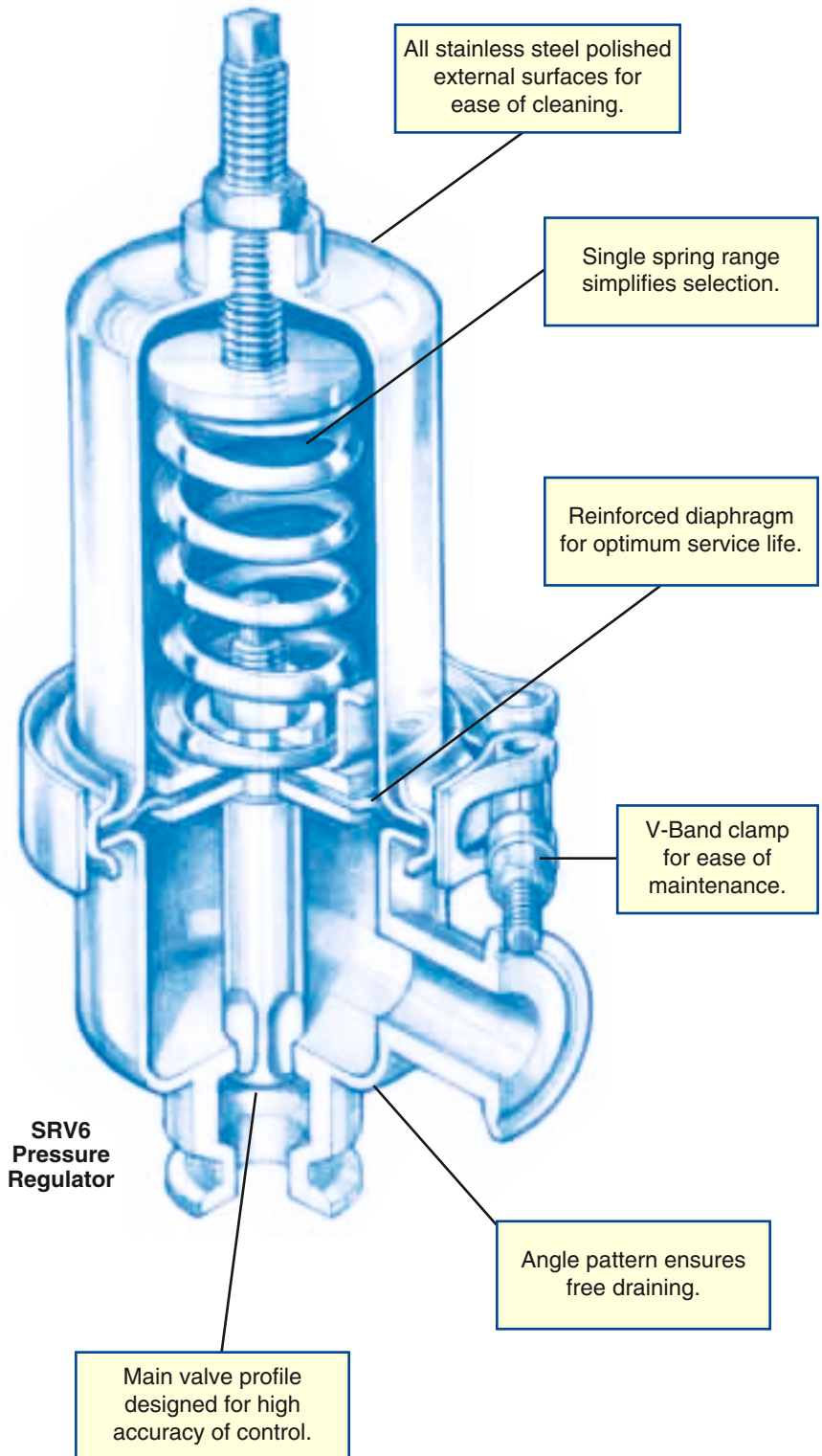
The SRV6 is a direct acting regulator designed to reduce pressure in clean and pure steam, liquid and gas systems. Available in 1", 1-1/2" and 2" sizes, the SRV6 is manufactured in 316/316L stainless steel, with all wetted parts mechanically polished to 20 microinches Ra, then electropolished. The angle pattern design ensures that the valve is self draining, while Tri-Clamp® compatible connections ease removal and ensure cleanliness. Diaphragm restraints and valve travel stop, which are standard features, prevents excessive diaphragm movement under vacuum conditions, which extends service life and reduces maintenance costs.

## How the SRV6 Pressure Regulator Works

Downstream pressure is set by compressing the control spring. On start-up, flow passes through the main valve resulting in a downstream pressure buildup. As the downstream pressure begins to rise it acts on the underside of the diaphragm, opposing the spring force and causing the main valve to move closer to its seat. This movement throttles the flow, ensuring that the downstream pressure is accurately controlled at the desired set point.

## SRV6 User benefits

- Accurate control of pressure for optimum process control.
- Trouble free operation even under vacuum conditions.
- All wetted parts are electropolished 316/316L stainless steel to resist corrosion.
- Rugged yet lightweight construction reduces installation costs.
- Tri-Clamp® compatible connections for cleanliness and ease of removal.



## Typical Applications

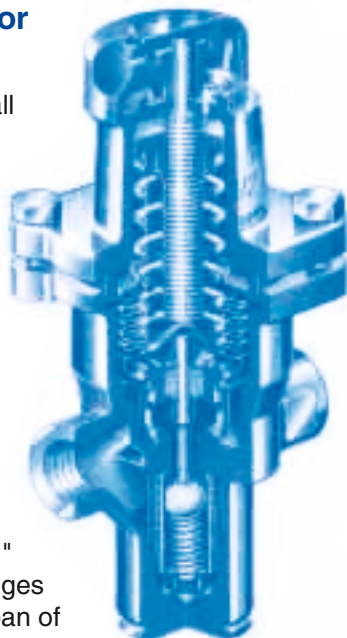
- Sterilizers
- Autoclaves
- Bioreactors
- Centrifuges
- Freeze dryers
- CIP/SIP Systems
- Process tanks
- Humidifiers
- Culinary equipment

## Additional Stainless Steel Pressure Regulators

In addition to the SRV6, Spirax Sarco offers a comprehensive range of stainless steel regulators suitable for steam, gas and liquid service. This range of products is designed to withstand service conditions that are common in applications such as sterilizers, autoclaves, culinary equipment and humidifiers.

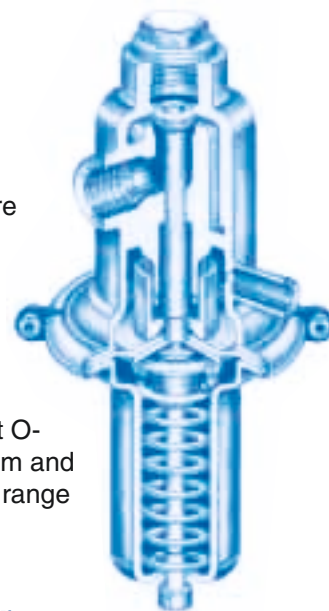
### SRV2 Pressure Regulator

The SRV2 is a direct acting pressure reducing valve with all 316/316L wetted components suitable for use in steam, compressed air and other gas services. The compact design of the SRV2 makes it ideal for point of use applications such as sterilizers and autoclaves, offering a cost effective alternative to more complicated pilot or piston operated valves. The SRV2 is available with threaded connections in 1/2", 3/4" and 1" sizes. Three control spring ranges allow operation over a wide span of downstream pressures.



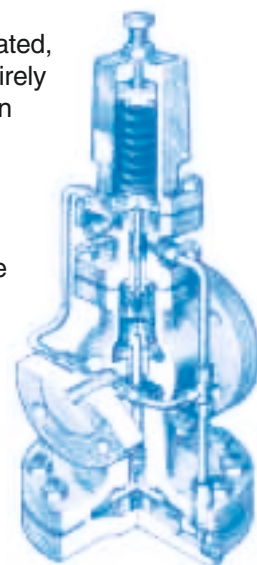
### SRV461/463 Pressure Regulator

The simple and accurate pressure controlling SRV461 (threaded)/463 (flanged) regulators with 316 Ti wetted parts ensure corrosion resistance against aggressive steam and process fluids. The valve head is supplied with a soft O-ring seal for tight shut off on steam and liquid service. The SRV461/463 range is available in sizes 1/2" to 2".



### DP163 Pressure Regulator

The DP163 is a self-powered, pilot operated, pressure reducing valve constructed entirely of stainless steel. Its self-acting operation eliminates the cost of an external power source. Color coded, interchangeable springs allow quick and easy change of downstream pressure range eliminating the need to isolate the valve or break the steam line. Downstream pressure is sensed either internally or through an external sensing pipe. The DP163 is available in sizes 1/2" to 3" with flanged connections. Typical applications include main line pressure reduction or where high accuracy of control is required.



#### SRV6

#### SRV2

#### SRV461 and 463

#### DP163

Sizes	1", 1-1/2", 2"	1/2", 3/4", 1"	1/2", 1", 1-1/4", 1-1/2", 2"	1/2", 3/4", 1", 1-1/4", 1-1/2", 2", 3"
Construction	316/316L Stainless steel wetted parts mechanically polished to 20 microinch Ra then electropolished External parts electropolished PTFE faced viton diaphragm	316L Stainless Steel	316 Ti stainless steel, EPDM diaphragm	316L stainless steel body Stainless steel internals
Connections	Tri-Clamp® compatible	NPT	NPT (461), ANSI 150 (463)	ANSI 300
Maximum Operating Pressure	116 psig	275 psig	174 psig	304 psig
Maximum Operating Temperature	347°F	413°F	374°F 266°F with soft valve trim	432°F
Maximum C <sub>v</sub>	1" 5.5 1-1/2" 13.5 2" 27	1/2" 1.8 3/4" 2.9 1" 3.5	1/2" 4.7 1-1/4" 14.0 3/4" 5.9 1-1/2" 18.7 1" 7.0 2" 21.1	1/2" LC 1.1 1-1/4" 14.0 1/2" 3.2 1-1/2" 19.8 3/4" 6.4 2" 32.7 1" 9.4 3" 78.8
Downstream Pressure Range	7-75 psi	2-25 psi, 20-60 psi 50-125 psi	4-16 psi, 12-36 psi 30-75 psi	3-45 psi, 40-100 psi 90-250 psi, 230-304 psi
Options	Soft seat (SRV6G)	BSP Connections	BSP, DIN PN16, or BS4504 Connections Non-standard pressure ranges Soft seat (461S & 463S)	BS, DIN or ANSI 150 connections Soft seat (DP163G)
TIS #	3.111	3.108	3.110	3.080, 3.081, 3.082

# Steam Filters

Loss of production, incomplete sterilization, or product contamination are all conditions that can result from poor steam quality and purity. Spirax Sarco steam filters are designed to help eliminate these costly and avoidable occurrences by ensuring both moisture and solid contaminant particles, such as pipe scale and rust, are filtered from the steam supply.

## The CSF26 Steam Filter

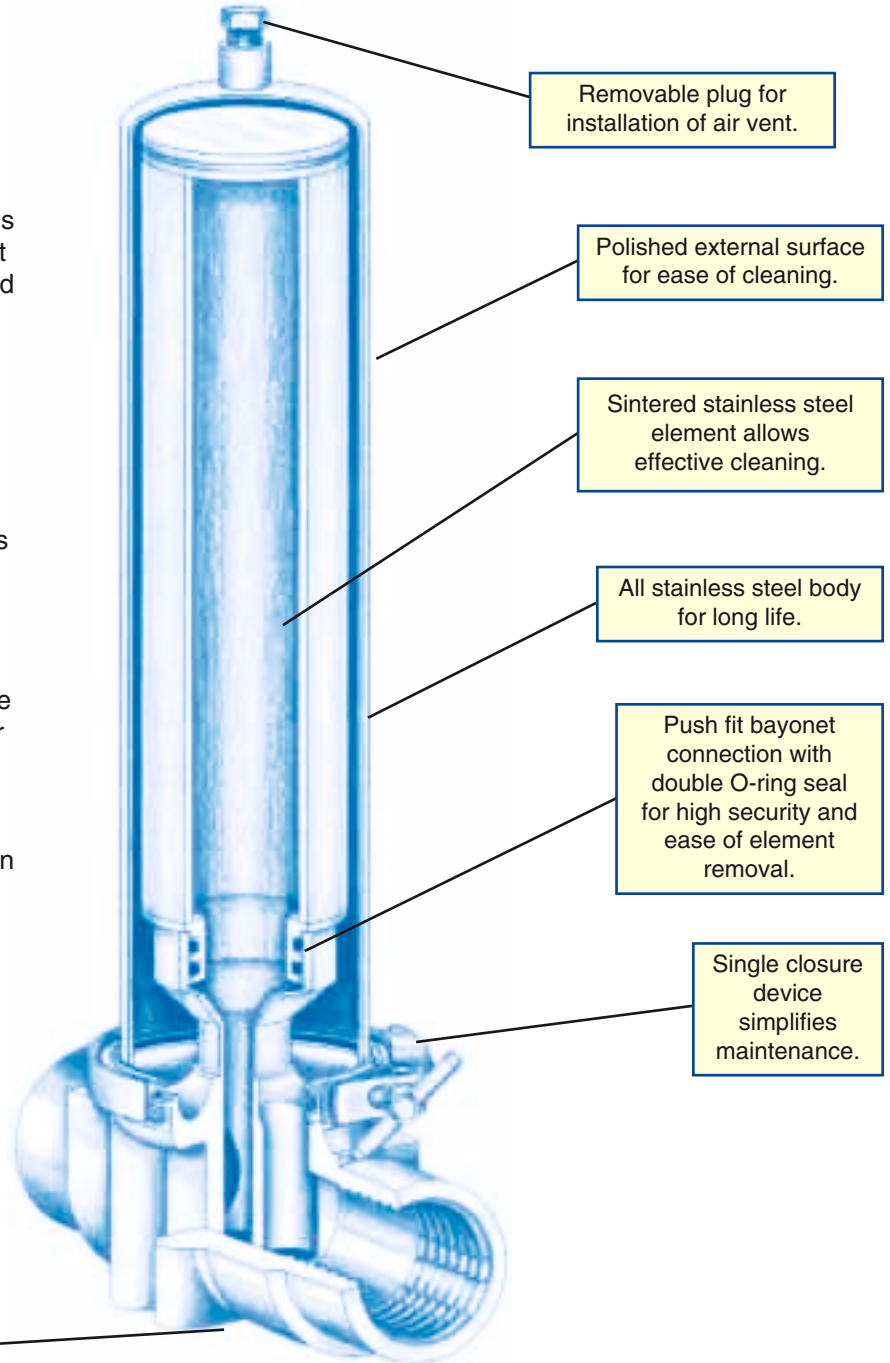
The CSF26 Steam Filter is an all 316L stainless steel unit with a removable sintered stainless steel element available in sizes up to 3". A single closure device allows for ease of maintenance, while a cleanable element ensures optimum efficiency and prolonged life.

## Available Types

Available in a range of sizes from 1/2" to 3", the CSF26 is supplied with a 2.8 micron absolute rated element. Also available, are complete filter stations which are in accordance with 3-A accepted practice guidelines. Each filter station includes a separator, strainer, auxiliary products and steam filter, which when used in combination ensure efficient steam filtration and prolong element life.

## Typical Applications

- Hospital Sterilizers
- Autoclaves
- Direct Injection Food Processing
- Product Curing



## User benefits

- Cleanable element reduces total cost of ownership.
- Complete filter stations available from one source ensures equipment compatibility.
- Filter and filter stations conform to 3-A Accepted Practice Number 609-00.
- Effective moisture and particle separation for optimum processing efficiency.
- Compact design for ease of installation and maintenance.

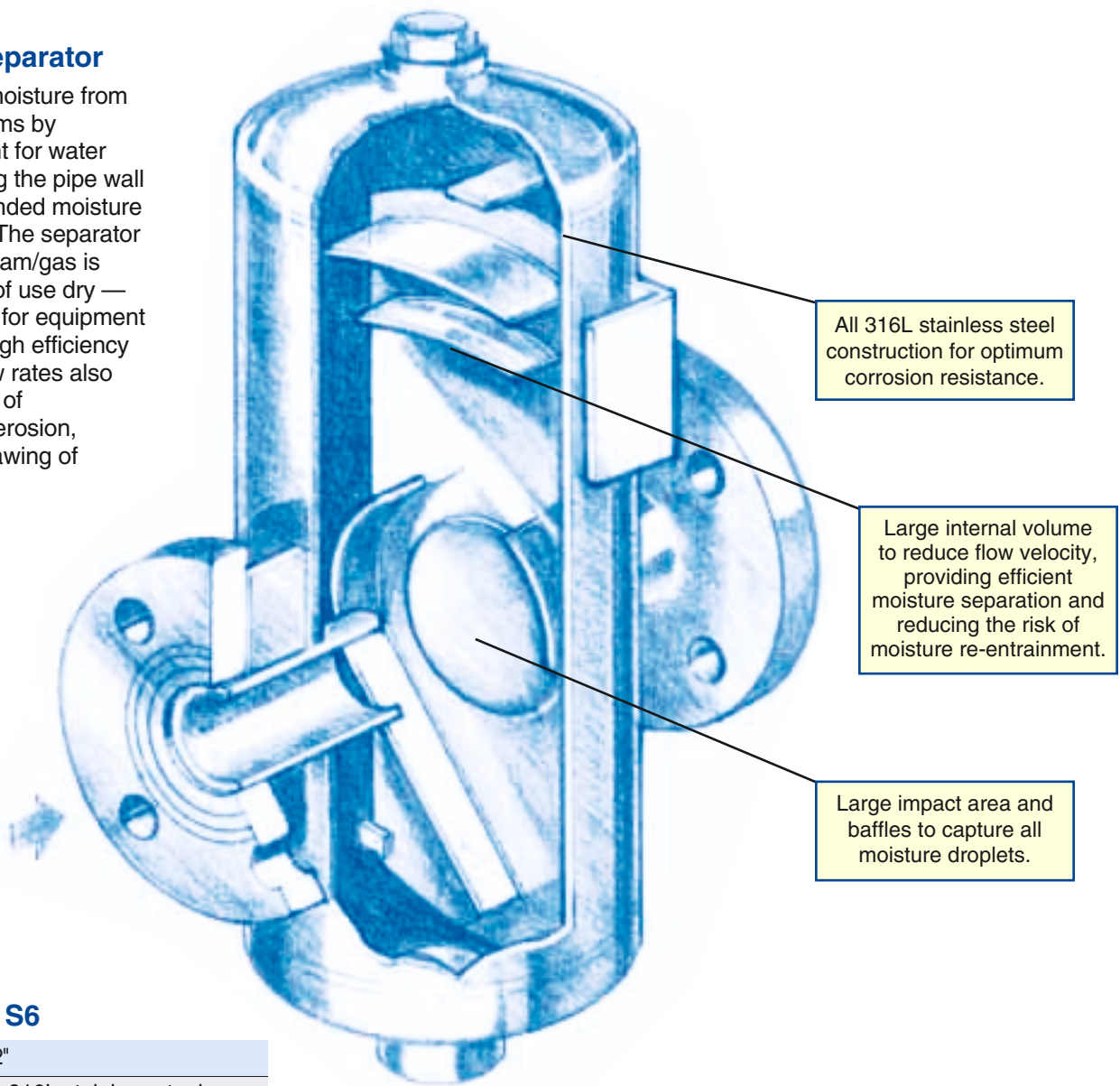
## CSF26

Sizes	1/2", 3/4", 1", 1-1/2", 2", 2-1/2", 3"
Construction	Type 316 stainless steel polished externally 2.8 micron 316L stainless steel filter element
Connections	NPT (1/2" - 2"), ANSI 150 (2-1/2" and 3")
Maximum Operating Pressure	150 psig
Maximum Operating Temperature	366°F
Options	Tri-Clamp® compatible connections 4" and 6" sizes available on request
TIS #	7.005

# Auxiliary Products

## S6 & 1808 SS Separator

Separators remove moisture from steam and gas systems by providing a drain point for water droplets moving along the pipe wall and deflecting suspended moisture out of the main flow. The separator therefore ensures steam/gas is delivered to its point of use dry — particularly important for equipment such as sterilizers. High efficiency at wide ranges of flow rates also minimizes the effects of condensate such as erosion, corrosion and wiredrawing of valve seats.



### S6

Sizes	1/2" - 2"	
Construction	Cast 316L stainless steel	
Connections	NPT, SW, ANSI 150 & 300 flanged	
Maximum Operating Pressure & Temperature	NPT, SW	600 psig/489°F
	ANSI 150	210 psig/392°F
	ANSI 300	600 psig/489°F
Options	N/A	
TIS #	7.006	

### 1808

Sizes	2 1/2", 3", 4", 6"	
Construction	Fabricated 316L stainless steel	
Connections	ANSI 300	
Maximum Operating Pressure & Temperature	2 1/2"	367 psig/437°F
	3", 4"	294 psig/414°F
	6"	441 psig/455°F
Options	ANSI 150 connections	
TIS #	7.003	

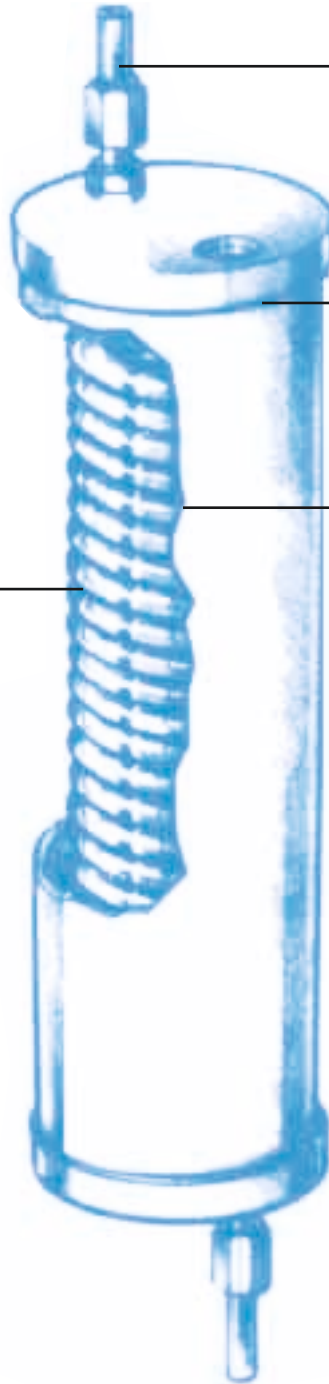
### User benefits

- Improves process plant productivity and product quality.
- Reduces maintenance costs and down time.
- Increases plant and control valve life on steam and air systems.
- Removes risk of waterhammer damage and subsequent maintenance bills.
- Simple, robust and efficient separator design. Requires no maintenance.

# Auxiliary Products

## SC 20 Sample Cooler

The SC 20 is used to take samples from clean high purity steam and water systems, preventing "flashing-off" or high temperatures which can be dangerous and could result in an inaccurate sample. Its 316L stainless steel construction with counter current flow provides accurate, contamination free samples. The compact, maintenance-free design makes it ideal for either permanent or mobile installation.



Tube and Tri-Clamp® compatible connection options for simplified installation.

Compact design ideal for mobile installations.

All 316L stainless steel construction for optimum system integrity.

Continuous coil minimizes risk of sample contaminations.

### User benefits

- 316L stainless steel for long life and contamination free samples.
- Counter current flow for efficient cooling.
- Pipe configuration ensures that coil is always immersed in cooling water.
- Compact and maintenance free design.

### SC 20

Sizes	1/4" coil, 1/2" body
Construction	Type 316L stainless steel
Connections	Coil: O.D. tube or 1/2" Tri-Clamp® compatible (inlet only) Body: NPT
Maximum Operating Pressure	Coil: 464 psi Body: 145 psi
Maximum Operating Temperature	Coil: 572°F Body: 212°F
TIS #	10.3705

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