

## CS10 Stainless Steel Clean Steam Separator

### Description

Even in the cleanest and best designed clean steam system entrained moisture can still occur, resulting in an unacceptably low dryness fraction, non-compliance of critical sterilization standards, damage to control valves/instrumentation and a generally low efficiency of the system.

The CS10 clean steam separator has been designed in full accordance with the latest edition of ASME BPE to overcome the issues of removing entrained moisture from clean and pure steam systems.

### Available types

Model	CS10-1	CS10-2
<b>Internal</b>	20 $\mu$ -in Ra (0.5 $\mu$ m) maximum/SFV1 - as outlined in ASME BPE, with all welds ground and polished.	30 $\mu$ -in (0.75 $\mu$ m) Ra maximum/SFV3 - as outlined in ASME BPE, with all welds passivated but left as laid.
<b>External</b>	1.6 $\mu$ m (63 $\mu$ -in) Ra maximum, with a satin bead blast finish.	

### Optional surface finish (CS10-1 only)

<b>Internal</b>	Polish to 20 $\mu$ -in Ra (0.5 $\mu$ m) maximum + Electropolished.
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**Note:** Both options have been designed with the feature of a removable baffle plate, allowing the unit to be fully inspected prior to installation and to ease periodic cleaning and de-rouging.

### Standards

This product has been designed in accordance with the latest standard of the ASME BPE guide. It also complies with the requirements of the European Pressure Equipment Directive 97/23/EC. All elastomers used comply with FDA regulation CFR 21 paragraph 177 section 2600.

1/2", 3/4" and 1" sizes are available with USP class VI.

### Certification

This product is available with the following certification:

- EN 10204 3.1 material certifications.
- Certificate of conformity including internal surface finish.
- Certification of elastomer FDA/USP compliance (the polymers for the 1 1/2" and 2" sizes are FDA approved only).

**Note:** All certification/inspection requirements must be stated at the time of order placement.

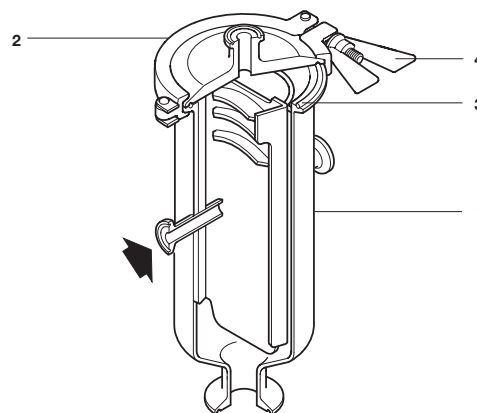
### Packaging

Packaging for this product is conducted in a clean environment, segregated from other non stainless steel products, and in accordance with ASME BPE for optimum protection and cleanliness; The inlet and outlet connections of the product are fitted with protective caps before being sealed with shrink wrap.

### Sizes and pipe connections

<b>Steam inlet and outlet pipe</b>	1/2", 3/4", 1", 1 1/2" and 2" Sanitary clamp ASME BPE (Tri-clamp®) or DIN 32676 upon request. Extended tube weld ends (ETO) ASME BPE or DIN 11850 upon request.
<b>Drain</b>	1" ASME BPE (Tri-clamp®)
<b>Vent</b>	1/2" ASME BPE (Tri-clamp®)

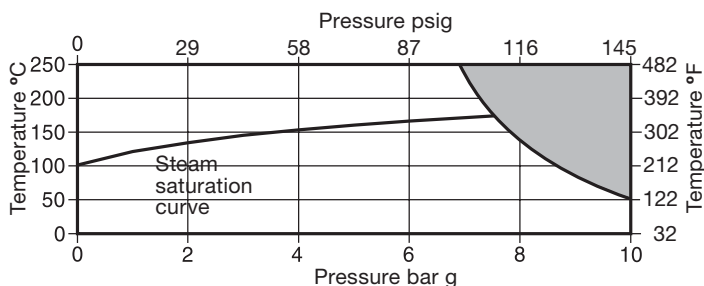
**Note:** Other connections are available upon request.



### Materials

No.	Part	Material
1	Body	Fabricated stainless steel
		ASTM A312 316L
		ASTM A240 316L
2	Cover + Baffle	Fabricated stainless steel
		ASTM A276 316L
3	Seal	Viton
4	Clamp	Stainless steel
		AISI 316

### Pressure/temperature limits (ISO 6552)



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

**Note:** For hygienic/sanitary clamp ends the maximum pressure / temperature may be restricted by the gasket or sanitary clamp used. Please consult Spirax Sarco.

Body design conditions	PN10
PMA Maximum allowable pressure	10 bar g @ 50°C (145 psig @ 122°F)
TMA Maximum allowable temperature	250°C (482°F)
Minimum allowable temperature	-10°C (14°F)
PMO Maximum operating pressure for saturated steam service	7.6 bar g (110 psi g)
TMO Maximum operating temperature	250°C @ 6.8 bar g (99 psig @ 482°F)
Minimum operating temperature	0°C (32°F)
Designed for a maximum cold hydraulic test pressure of 15 bar g (217 psig)	

Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only.

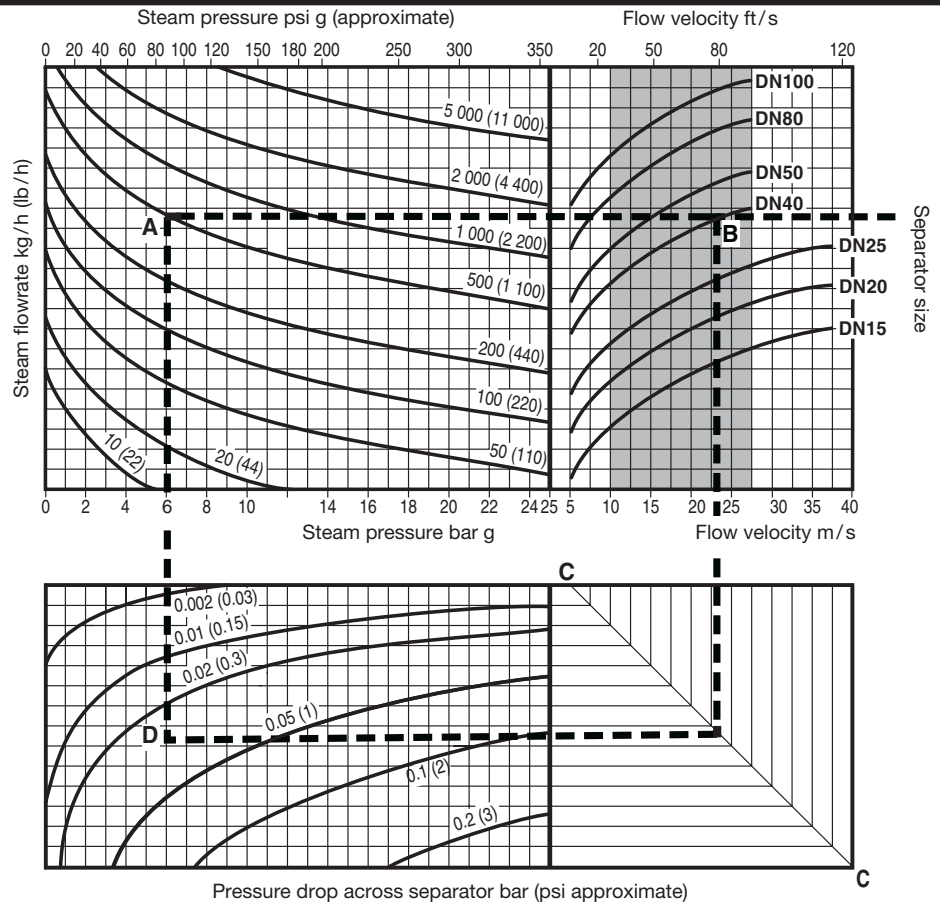
In the interests of development and improvement of the product, we reserve the right to change the specification.

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## Steam sizing example

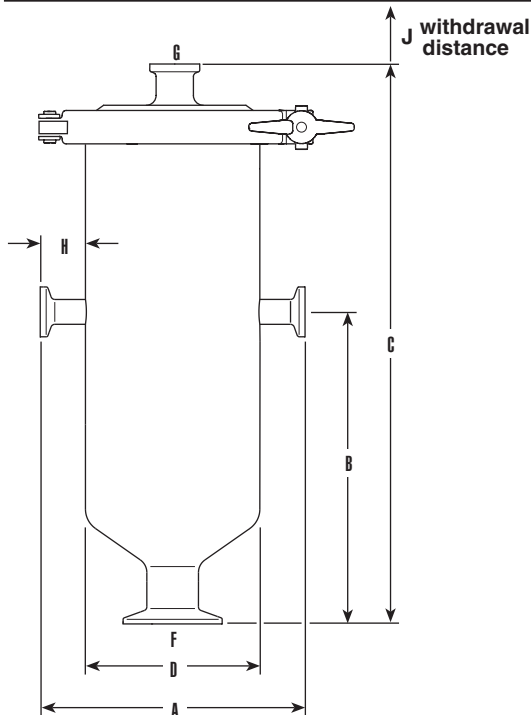
- Plot point A** where the steam pressure and flowrate cross, e.g. 6 bar g / 500 kg/h: Draw a horizontal line.
- Select line size.** Any separator curve that is bisected by this line within the shaded area will operate at near 100% efficiency, e.g. 1½" (DN40), point B.
- Ascertain velocity.** Line velocity for any size can be determined by dropping a vertical line from this intersection. From point B this line crosses the velocity axis at 23 m/s.
- Pressure drop.** Where the line extended from point B crosses the line C - C, plot a horizontal line. Now drop a vertical line from point A. The point of intersection, D, is the pressure drop across the separator, i.e. about 0.035 bar.
- Separators should be selected on the basis of the best compromise between line size, velocity and pressure drop for each application.**

**Note:** For larger sizes and alternative, metals and pressure and temperatures that exceed these operating conditions please contact Spirax Sarco for a bespoke product. Independent research carried out by Liverpool University in England provided the experimental data from which the above graph was derived.



## Dimensions, weights and volume (approximate) mm, kg and litres (inches, lbs and gallons)

Steam inlet/outlet size	A	B	C	D	F (drain)	G (vent)	H	J	Weights	Volume
½"	135 (5.3)	161 (6.3)	290 (11.4)	88.9 (3.5)	1"	½"	23 (0.9)	215 (8.5)	3.0 (6.6)	1.2 (0.3)
¾"	160 (6.3)	178 (7.0)	371 (14.6)	114.3 (4.5)	1"	½"	23 (0.9)	290 (11.4)	5.0 (11.0)	2.5 (0.7)
1"	160 (6.3)	178 (7.0)	371 (14.6)	114.3 (4.5)	1"	½"	23 (0.9)	290 (11.4)	5.0 (11.0)	2.5 (0.7)
1½"	195 (7.7)	213 (8.4)	485 (19.1)	141.3 (5.6)	1"	½"	27 (1.1)	400 (15.7)	9.2 (20.3)	5.5 (1.5)
2"	195 (7.7)	213 (8.4)	535 (21.0)	141.3 (5.6)	1"	½"	27 (1.1)	450 (17.7)	10.0 (22.0)	6.3 (1.7)



## Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P023-60) supplied with the product.

### Installation note

The CS10 is designed for installation in horizontal lines. Check arrow for correct orientation.

**Note:** The body and internals must be handled carefully to ensure that the surface finishes are not damaged.

### How to order

**Example:** 1 x 2" Spirax Sarco CS10-1 stainless steel clean steam separator with removable baffle plate. Sanitary clamp connections to ASME BPE, internal surface finish of 20 micro-inch complete with material certification to EN 10204 3.1.

### Spare parts

Please refer to the dimension drawing to the left.

### Available spares

Seal	<b>3</b>
Clamp	<b>4</b>

### 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 separator.

**Example:** 1 x Seal for a Spirax Sarco 1½" CS10-1 stainless steel clean steam separator.

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