



Cert. No. LRQ 0963008

ISO 9001



TI-P185-01
ST Issue 10

CSF16

Stainless Steel Filter

Description

The CSF16 is a horizontal, in-line high efficiency filter used to remove contaminate particles from steam, gas and liquid systems. The filter housing is available in a choice of austenitic stainless steel (1.4301) designated CSF16 or (1.4404) designated CSF16T. The housing is externally polished with an internal natural finish. The housing is constructed in two halves joined by a food industry fitting to DIN 11851. Replaceable elements in sintered austenitic stainless steel are available with either 1, 5 or 25 micron absolute rating. In some pipe sizes the element is available in a choice of low capacity designated 'L' and high capacity designated 'H'.

Options

The CSF16 housing and element is available with a variety of different seal materials, some of which meet the requirements of FDA regulations (EPDM, Flouraz and PTFE). The CSF16 is fitted with EPDM as standard. However for higher temperature, or more aggressive applications other materials are available on request. Please consult Spirax Sarco.

Standards

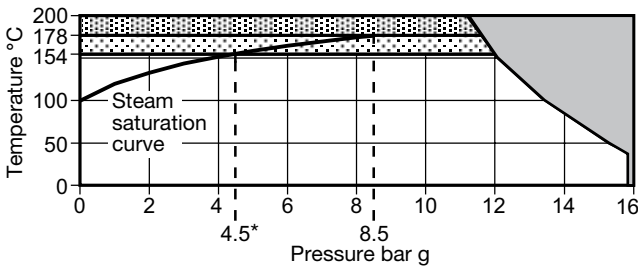
This product fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC and carries the **CE** mark when so required.

The CSF16, when fitted with a 5 micron element is capable of removing 95% of particles 2 microns and larger in size, in accordance with the requirements for the production of culinary steam to 3A accepted practice number 609-03 . Accepted in the U.S. Department of Agriculture for use in federally inspected meat and poultry plants.

Certification

The product can be supplied with a modified housing in order to provide certification to EN 10204 3.1. **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.

The product should not be used in this region due to the limits of the housing seal.

The product should not be used in this region due to the limits of the EPDM seal if fitted.

PMA	Maximum allowable pressure	DN10 to 65 (1/4" to 2 1/2")	16 bar g
		DN80 (3")	L version 16 bar g H version 12 bar g
TMA	Maximum allowable temperature	200°C @ 11.2 bar g	
	Minimum allowable temperature	-50°C	
* PMO	Maximum operating pressure	EPDM	4.5 bar g @ 154°C
		AFLAS and Flouraz	8.5 bar g @ 178°C
TMO	Maximum operating temperature	EPDM	154°C @ 4.5 bar g
		AFLAS and Flouraz	178°C @ 8.5 bar g
	Minimum operating temperature	0°C	
ΔPMX	Maximum differential pressure	5 bar g	
Designed for a maximum cold hydraulic test pressure of:		DN10 to 65 (1/4" to 2 1/2")	20.8 bar g
		DN80 (3")	L version 20.8 bar g H version 15.6 bar g

Sizes and pipe connections

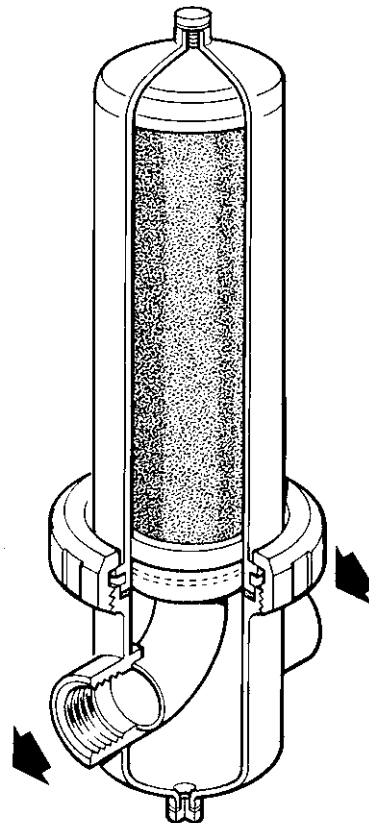
Screwed BSP and NPT:

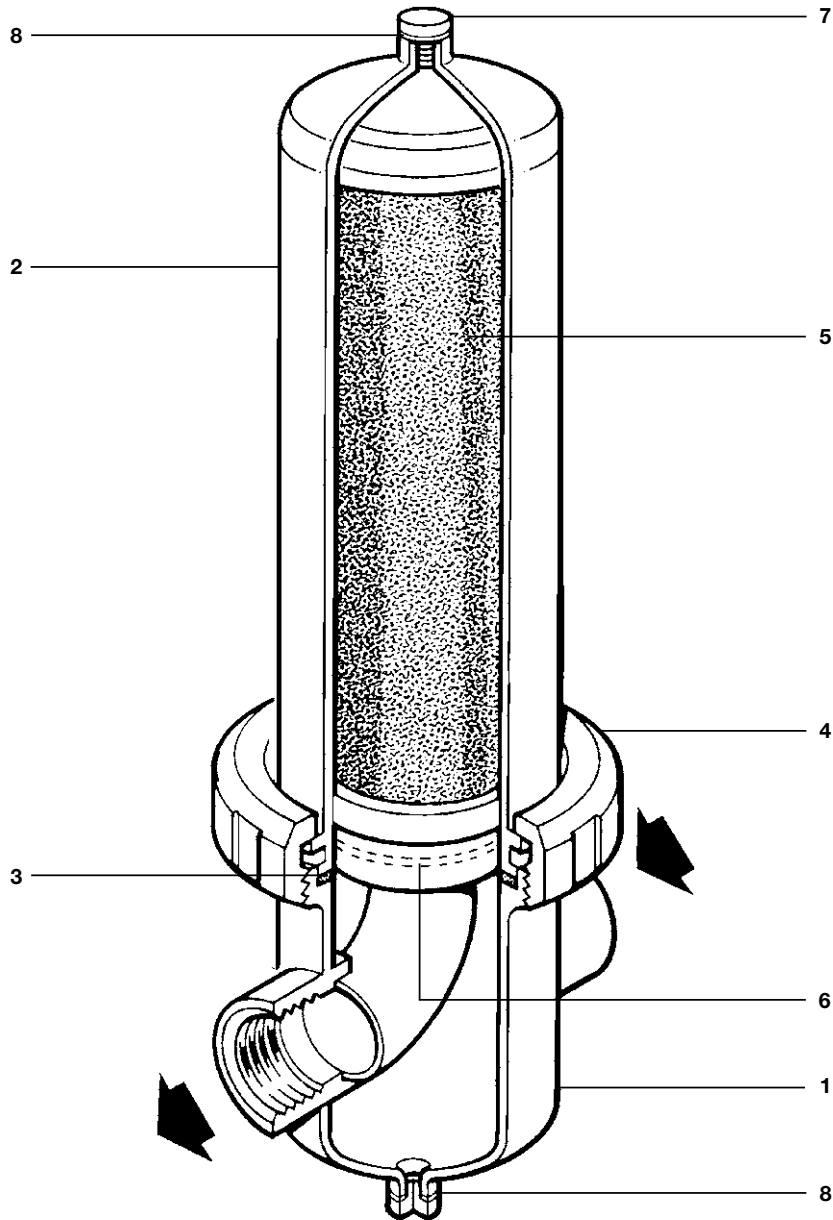
1/4", 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 2 1/2" and 3"

Flanged ASME (ANSI) 150 and EN 1092 PN16:

DN10, DN15, DN20, DN25, DN32, DN40, DN50, DN65 and DN80.

Alternative end connections and larger sizes are available, please consult Spirax Sarco for details.

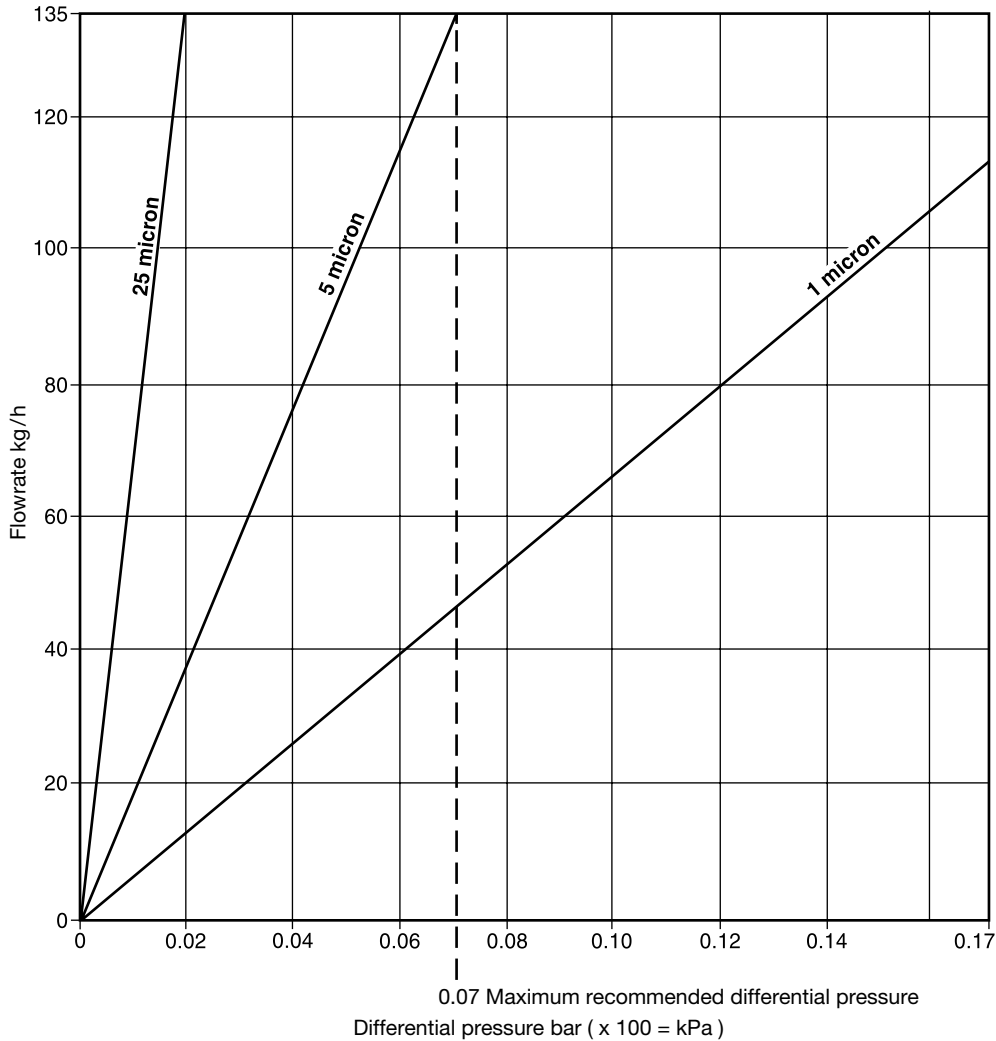




Materials

No.	Part	Materials	CSF16	CSF16T
1	Filter housing bowl	Stainless steel	1.4301	1.4404
2	Filter housing head	Stainless steel	1.4301	1.4404
3	Housing seal	Fluoraz or EPDM - DN80H and 80HT only Please note: - Fluoraz and EPDM materials meet the requirements of regulations FDA21 CFR Part 177.2600. - PTFE materials meet the requirements of regulations FDA 21 CFR Part 177.1550. EPDM - all other sizes AFLAS available as an option		
4	Housing ring	Stainless steel		1.4301
5	Filter element	Stainless steel	Filter medium	1.4404
6	Filter element seal (2 off)	EPDM	End cap	1.4301
7	Plug	Stainless steel	1.4301	1.4404
8	Gasket	PTFE		
9	Flange (not shown)	Stainless steel	1.4541	

Capacities Saturated steam 1.0 bar g; DN50 CSF16



Capacity correction factors for steam pressure

Steam pressure bar g	0	1	2	3	4	5	6	7	8	8.6
Correction factor	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	4.8

Element size correction factors for filter element

Size DN	8	10	15	20	25	32	40	50L	50H	65	80L	80H
Correction factor	0.08	0.13	0.17	0.25	0.39	0.50	0.67	1.00	1.50	2.00	2.70	4.00

Selection example

Select a steam filter for a flowrate of 850 kg/h with saturated steam pressure at 4 bar g. A 5 micron rating is required with maximum 0.05 bar pressure drop allowed.

Step 1: Divide the flowrate required by the capacity correction factor for the operating steam pressure. In this case, 850 kg/h is divided by 2.5 for an equivalent 340 kg/h flow.

Step 2: From the capacity graph, select the micron rating required. Note where this line intersects the maximum pressure drop and go horizontally to read off the flowrate. In this case, the 5 micron line meets the 0.05 bar pressure drop allowed at maximum flowrate of 100 kg/h.

Step 3: Divide the equivalent flow calculated in step (1) by the maximum flowrate in step (2). Hence in this example, we have $340/100 = 3.4$ factor.

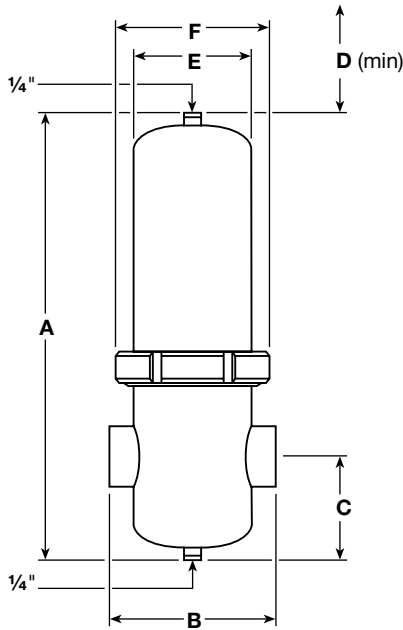
Step 4: From the element size correction factor table, select the nearest suitable conversion factor obtained in step (3) and select the appropriate element size. In the example DN80H CSF16 has a factor of 4.00. Note that if pressure drop must be minimized, always select the element based on a higher correction factor than that calculated.

Filter element

In steam/gas service, 100% of particles larger than the pore size chosen will be retained by the element. Note that the 1 micron element has an efficiency of 99.7% based on 0.2 micron particles. Selecting a pore size smaller than required will result in reduced service life and higher pressure drop. The CSF16 elements can be cleaned by immersion in dilute hydrochloric acid, ultrasonic bath, clean water, or air, depending on the type of contamination. However, once the pressure drop across the filter (even after cleaning) reaches 0.7 bar the element should be replaced. **Note:** We strongly recommend that a spare filter element set is carried in stock.

Dimensions/volume and weights (approximate) in mm, litres and kg

Type	Size	A	B				C	D	E	F	Volume	Weight (*without element)		
			BSP, NPT	ASME 150	PN16	Scr*						Flg*	Element	
CSF16 and CSF16T	DN10 ¼"	215	108	205	180	55	90	70	112	0.55	1.7	2.7	0.20	
	DN10 ⅜"	243	108	205	180	55	120	70	112	0.65	1.9	2.9	0.20	
	DN15 ½"	243	108	205	180	55	120	70	112	0.65	1.9	3.4	0.37	
	DN20 ¾"	266	125	230	202	55	150	70	112	0.75	2.0	4.0	0.45	
	DN25 1"	293	125	248	212	74	150	85	127	1.00	2.6	4.8	0.47	
	DN32 1¼"	344	140	257	220	74	200	85	127	1.25	3.0	6.4	0.51	
	DN40 ½"	386	170	285	245	94	200	104	148	2.30	4.3	8.0	1.27	
	DN65 2½"	732	216	340	290	106	580	129	178	8.00	9.0	15.0	2.77	
CSF16L and CSF16LT	DN50 2"	460	170	298	260	94	280	104	148	3.30	4.8	10.0	1.60	
	DN80 3"	987	216	340	300	106	850	129	178	11.10	10.8	18.2	3.81	
CSF16H and CSF16HT	DN50 2"	587	170	298	260	94	450	104	148	4.30	5.3	10.5	2.25	
	DN80 3"	1026	240	380	340	119	850	154	210	16.50	16.2	23.6	4.90	



Spare parts

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

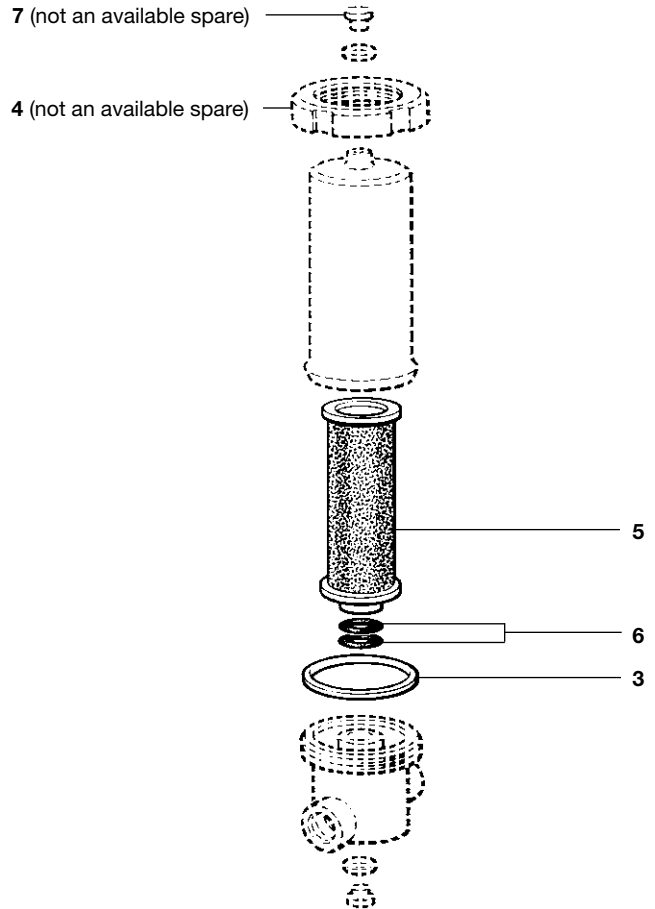
Available spares

Filter element	5, 6 (2 off)
Seal kit	6 (6 off), 3 (3 off)

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 filter housing, filter element rating and housing/filter element seal material required.

Example: 1 off 5 micron filter element kit for a Spirax Sarco DN25 CSF16 clean steam filter, with AFLAS filter element seals.



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P185-02) which is supplied with the product.

How to order

The following information must be specified when ordering a Spirax Sarco CSF filter:

Steam flowrate	kg/h
Steam pressure	bar
Allowable pressure drop bar	(0.07 bar maximum recommended)
Housing material	1.4301 or 1.4404
* Size	DN or NPS (")
Pipe connections	EN, BSP or NPT
Element rating	1, 5 or 25 micron.
Housing seal/element seal material - consult Spirax Sarco.	

* **Note:** For DN50 and DN80 high capacity version denoted by 'H' and low capacity by 'L'. For a 1.4404 housing version, the suffix 'T' must be added to the nomenclature e.g. CSF16T.

Supply

The CSF16 is supplied in two parts:-

1. The filter housing head and bowl with housing seal packed in one carton.
2. The filter element complete with filter element seals (2 off).



Note: The job of the filter is to remove (and retain) unwanted contamination. In time, the filter element will become saturated. To ensure a minimum downtime, we recommend that a spare filter element set is ordered at the same time as the CSF16 filter housing.

Example:

1 off Spirax Sarco DN20 CSF16 to pass 100 kg/h saturated steam at 4.0 bar g. Allowable pressure 0.05 bar. Housing to be 1.4404 having NPT connections and filter element with a 5 micron rating with EPDM seals.

1 off spare filter element set having a 5 micron rating.

Recommended tightening torques

Item	 or  mm	N m
4	use C spanner	As required
7	¼" BSP	As required