

Selection information

How to select a Bernoulli Filter

The operating flow rate is the most important design criterion when selecting the size of the Bernoulli Filter. It is not always wise to select the same filter size as the connecting pipe, this since a too-large filter would generate unnecessarily high flushing losses.

This table shows possible combinations of flow capacity and filter baskets.

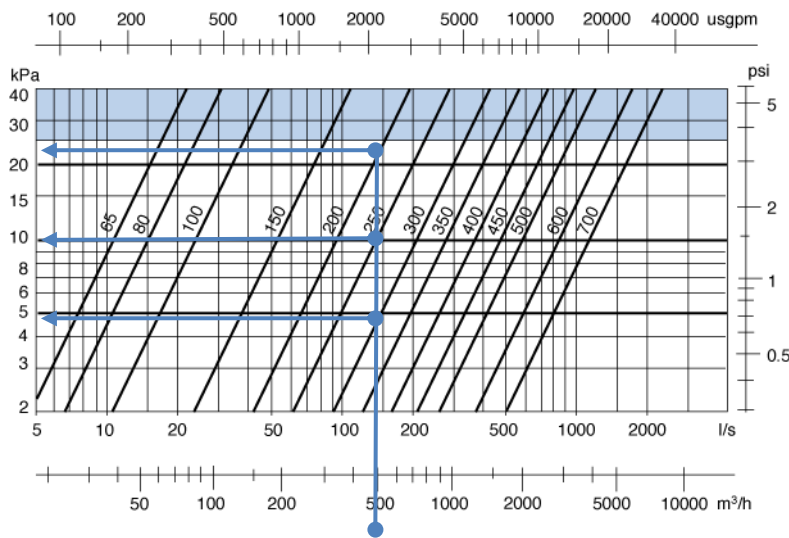
Filter model	Connec- tion	Filter body	Flow capacity (m ³ /h)	Filtration Perforated screens in AISI 316L (mm)	Filtration Wedge wire screens in AISI 316L (mm)	Filtration Perforated screens in Titanium (mm)	Filtration Expanded metal in AISI 316L (mm)
BSP 65	2 ½"	PVC	0-60	-	0.3/1.0	-	-
BSP 80	3"	PVC	15-83	1.0/2.0	0.2/0.3/0.5/1.0	1.0/1.5/2.0	0.1
BSP 100	4"	PVC	22-130	1.0/2.0	0.2/0.3/0.5/1.0	1.0/1.5/2.0	0.1
BSG 100	4"	GRP	22-130	1.0/2.0	0.2/0.3/0.5/1.0	1.0/1.5/2.0	0.1
BSG 150	6"	GRP	50-300	1.0/2.0	0.2/0.3/0.5/1.0	1.0/1.5/2.0	0.1
BSG 200	8"	GRP	100-522	1.0/2.0	0.2/0.3/0.5/1.0	1.0/1.5/2.0	0.1
BSG 250	10"	GRP	160-846	1.0/2.0	0.2/0.3/0.5/1.0	1.0/1.5/2.0	0.1
BSG 300	12"	GRP	200-1170	1.0/2.0	0.2/0.3/0.5/1.0	1.0/1.5/2.0	-
BSG 350	14"	GRP	270-1620	1.0/2.0	0.2/0.3/0.5/1.0	1.5/2.0	-
BSG 400	16"	GRP	360-2090	1.0/2.0	0.2/0.3/0.5/1.0	1.5/2.0	-
BSG 450	18"	GRP	454-2646	2.0	0.6/1.0	2.0	-
BSG 500	20"	GRP	600-3280	2.0	0.6/1.0	2.0	-
BSG 600	24"	GRP	810-4680	2.0	0.6/1.0	2.0	-
BSG 700	28"	GRP	1080-6370	2.0	1.0	2.0	-
BSS 80	3"	AISI 316L	15-83	1.0/2.0	0.2/0.3/0.5/1.0	-	0.1
BSS 100	4"	AISI 316L	22-130	1.0/2.0	0.2/0.3/0.5/1.0	-	0.1
BSS 150	6"	AISI 316L	50-300	1.0/2.0	0.2/0.3/0.5/1.0	-	0.1
BSS 200	8"	AISI 316L	100-522	1.0/2.0	0.2/0.3/0.5/1.0	-	0.1
BSS 250	10"	AISI 316L	160-846	1.0/2.0	0.2/0.3/0.5/1.0	-	-
BSS 300	12"	AISI 316L	200-1170	1.0/2.0	0.2/0.3/0.5/1.0	-	-
BSS 400	16"	AISI 316L	360-2090	1.0/2.0	0.2/0.3/0.5/1.0	-	-

Table showing possible combinations of filter baskets and filter housings.

Flow capacity in m³/h and US gpm

Filter model	Flow capacity (m³/h)	Flow capacity (US gpm)
BSC 65	0-60	0-264
BSP 80	15-83	66-365
BSP 100	22-130	97-572
BSG 100	22-130	97-572
BSG 150	50-300	220-1321
BSG 200	100-522	440-2299
BSG 250	160-846	705-3725
BSG 300	200-1170	880-5152
BSG 350	270-1620	1189-7133
BSG 400	360-2090	1585-9203
BSG 450	454-2646	1999-11651
BSG 500	600-3280	2646-14443
BSG 600	810-4680	3567-20607
BSG 700	1080-6370	4756-7794
BSS 80	15-83	66-365
BSS 100	22-130	97-572
BSS 150	50-300	220-1321
BSS 200	100-522	440-2299
BSS 250	160-846	705-3725
BSS 300	200-1170	880-5152
BSS 400	360-2090	1585-9203

The Bernoulli selection chart
Selection chart



The relation between flow rate and pressure drop over the Bernoulli Filter is shown in the selection chart above.

Different sizes of the Bernoulli Filter can be chosen for specific flows. The maximum allowed pressure drop over the filter (the upper grey zone) is 25 kPa or 3.6 psi. A larger size results in a lower pressure drop.

For example, three different sizes can be chosen at 500 m³/h: 200 / 250 / 300 (connection size in mm). The larger the size you choose, the lower the pressure drop you get. However there is no point in over sizing the filter unless the plant will expand with an increased flow, or if there are special demands for a very low pressure drop. Please bear in mind that the flushing volume increases with larger filters.

The Bernoulli Filter features a unique design. All filter sizes have been designed with a maximum inlet velocity of 4.6 m/s (15 ft/s), corresponding to a maximum pressure drop of 25 kPa or 3.6 psi. The pressure drop over the filter stays the same in both clean and dirty conditions.

The BSC 65

Filter model BSC 65 has a slightly different design than other Bernoulli Filters. The flushing valve is built into the end cover. When the piston leaves its upper position the flushing outlet opens and debris is flushed out. The two flushing phases are performed in a single step. This is possible because the disc has a wedge-shaped cutout.

Filter body material

For seawater (salt water) and brackish water applications the use of plastic filter housings is recommended. Bernoulli plastic filters are manufactured in GRP (Glass-fiber Reinforced Polyester) and PVC. GRP filters are available from 4" to 28" (DN 100-DN 700). The smallest Bernoulli Filters are manufactured in PVC (BSC 65, BSP 80 & BSP 100).

For fresh water applications, any filter body material can be selected. The AISI 316L filters are commonly used for fresh water applications. AISI 316L filters are available from 3" to 16" (DN 80 to DN 400).

Filter baskets

Filter baskets are available in stainless steel (316L) or in titanium. For seawater and brackish water, titanium baskets are recommended, especially when the water is chlorinated.

Perforated, wedge wire and expanded metal screens are available from 0.1 mm to 2.0 mm. The finest filtration degrees are achieved with an expanded metal screen. Wedge wire screens are recommended when water contains sand or fibrous materials. A wedge wire screen has a larger open area compared to a perforated screen, which is helpful when the water contains sand.

Installation

The Bernoulli filter can be installed in any position (horizontal, vertical or slanted). Filter body supports are not needed for small and medium-sized filters. The support from connecting piping is enough. For larger filters, it is apply a filter body support.

A straight run of pipe three times the diameter of the filter inlet should be installed in order to reduce the risk of turbulent flow and vibrations.

Design criteria

The standard design pressure for the Bernoulli Filter is 10 bar (150 psi g). Glass fiber filters (GRPs) starting from DN 300 or 12" (BSG 300) are also available with 6 bar (100 psig) design pressure.

Design temperature for different materials

Filter body material	Design temperature (°C)	Design temperature (°F)
PVC	40	104
GRP	60	140
GRP high temp	70	158
AISI 316L	80	176

Operation

1. The cylinder and the flushing valve are pneumatically operated with a minimum air pressure of 6 bar (100 psig).
2. Power supply: 230 V 50 Hz AC or 120 V 50 Hz AC.
3. Maximum pressure variation (water pressure) is 1:2.5.
4. Maximum suspended solids is 200 ppm (200 mg/l)
5. Minimum flushing pressure starts from 0.3 bar (4.3 psi g), measured between filter inlet and flushing outlet. During normal operation (no flushing) there is no minimum flow.

Filter model	Minimum flushing pressure		
	<i>Minimum flushing pressure is related to the basket type</i>		
	Wedge Wire (bar/psig)	Perforated (bar/psig)	Expanded metal (bar/psig)
BSP 65	0.4/6	-	-
BSP 80	0.3/4.5	0.3/4.5	0.3/4.5
BSP 100	0.3/4.5	0.3/4.5	0.3/4.5
BSG 100	0.3/4.5	0.3/4.5	0.3/4.5
BSG 150	0.8/12	0.6/9	0.4/6
BSG 200	0.8/12	0.6/9	0.5/7.5
BSG 250	0.3/4.5	0.3/4.5	0.3/4.5
BSG 300	0.3/4.5	0.3/4.5	0.3/4.5
BSG 350	0.6/9	0.5/7.5	0.4/6
BSG 400	0.8/12	0.7/10.5	0.6/9
BSG 450	1.0/15	-	0.9/13.5
BSG 500	0.4/6	-	0.3/4.5
BSG 600	0.7/10.5	-	0.6/9
BSG 700	1.2/18	-	1.1/16.5
BSS 80	0.3/4.5	0.3/4.5	0.3/4.5
BSS 100	0.3/4.5	0.3/4.5	0.3/4.5
BSS 150	0.9/13.5	0.6/9	0.5/7.5
BSS 200	0.8/12	0.6/9	0.5/7.5
BSS 250	0.3/4.5	0.3/4.5	0.3/4.5
BSS 300	0.3/4.5	0.3/4.5	0.3/4.5
BSS 400	0.8/12	0.7/10.5	0.6/9

This table shows the minimum flushing pressure for the Bernoulli Filter.