VB BERNOULLI *principle*

SELF-CLEANING INDUSTRIAL FILTERS

We offer you

- End-to-end solutions
- Continual innovation
- Genuine partnership
- Product customisation
- After sales service

VAN BORSELEN FILTERS

vb

Unwavering commitment to *your* filter solutions

Since 1922, VB has proven time and again that our customers come first, and that we can be counted on to solve industrial filter challenges in a wide variety of industries and applications. We partner you to provide the right filter solutions, quickly and efficiently.

Our way of working

First, we keep our organisation flat and flexible, with short decision pathways. This ensures that customer needs are rapidly detected and understood by the experts who can make a difference.

Second, our product design and management is built around customisation, and the tailoring of solutions to unique customer requirements.

Third, we maintain a global network of sales representatives and service technicians, to assist customers with technical filter solutions and routine maintenance as well as emergencies.

We also use ISO certified management systems to make sure our performance keeps on improving.

Satisfied customers, worldwide

Over the years, Our way of working has proven to be successful and highly appreciated by our customers. Today, thousands of corporations in over 80 countries enjoy the benefits of our filter technology, in everything from industrial cooling water systems to water treatment systems.

THE GAME-CHANGING WATER FILTER

Over thirty years ago, the founder of Bernoulli System noticed that the use of low-quality water, such as lake water and seawater, led to the fouling and clogging of plate heat exchangers (PHE) in cooling water systems. The solution was to design a simple, reliable, self-cleaning filter to protect PHEs by reducing the content of suspended solids in the intake water.

Why is it called VB Bernoulli?

VB Bernoulli System pioneered the application of the Bernoulli Principle, named after the Swiss scientist Daniel Bernoulli, to water filtration. The distinguishing feature of a VB Bernoulli Filter is a disc mounted on a pneumatic cylinder, which enables contactless cleaning of the filter. The cleaning sequence itself is automatic and continuous, requiring no manual intervention. The combination of a low flushing pressure of 0.3 bar with very few moving parts makes our filters truly unique on the market.

Typical applications

Since the fundamental purpose of a VB Bernoulli Filter is to reduce the content of suspended solids in water from natural sources, the scope of applications ranges from pre-filtration in water treatment to the protection of plate heat exchangers and sensitive process equipment such as spray nozzles. It is used in a variety of industries ranging from power generation, petrochemicals, and HVAC to steelmaking, aquaculture, pharmaceuticals, pulp and paper, and foods and beverages.

About VB Bernoulli Filter

The VB Bernoulli Filter is pneumatically operated, making its automatic cleaning process simple and reliable, with very little mechanical wear. The filter is supported by a control panel with a programmable logic controller (PLC), a flushing valve including an actuator and differential pressure sensor. Thanks to the flexible nozzle orientation,
VB Bernoulli Filters can be installed in almost any position, either horizontally or vertically. Since the VB Bernoulli Filter operates as a pressure filter, it is always installed downstream of the feed pump.

Single-basket VB Bernoulli Filters come in a variety of different materials from plastics to stainless steel and other metals. Our standard three products lines are VBP, VBS and VBG.

VBP

The VBP product line was developed to offer a cost-effective option for small capacities. The filter body in a VBP filter is made of PVC (polyvinyl chloride), which provides high chemical resistance in seawater applications. The BSP product line consists of three models, DN65 (2,5") – DN100 (4"), handling capacities of up to 130 m^3/h.

VBS

This product line – meets the requirements of industries where stainless steel 316 is the material of choice. The VBS product line is made with a stainless steel 316 filter body and includes seven models, DN80 (3") - DN400 (16") handling capacities of up to 2000 m^3/h.

VBG

The VBG product line was introduced in order to meet the tough corrosion challenges faced by products operating in seawater-based cooling systems. VBG filters are made of GRP (glass fiber-reinforced polyester). The use of GRP further strengthens the advantages of the filter system in terms of material durability and very large weight savings. In the VBG product line, capacities up to 6400 m^3/h can be supported among the eleven models we offer, ranging from DN100 (4") to DN700 (28").

BUILT TO LAST

Choose a VB Bernoulli Filter, and you get a reliable filter with an ingeniously simple design that ensures continuous, safe operation year after year. Quite simply, our filters are effective and they last!

VAN BORSELEN FILTERS

CLEANING TECHNOLOGY

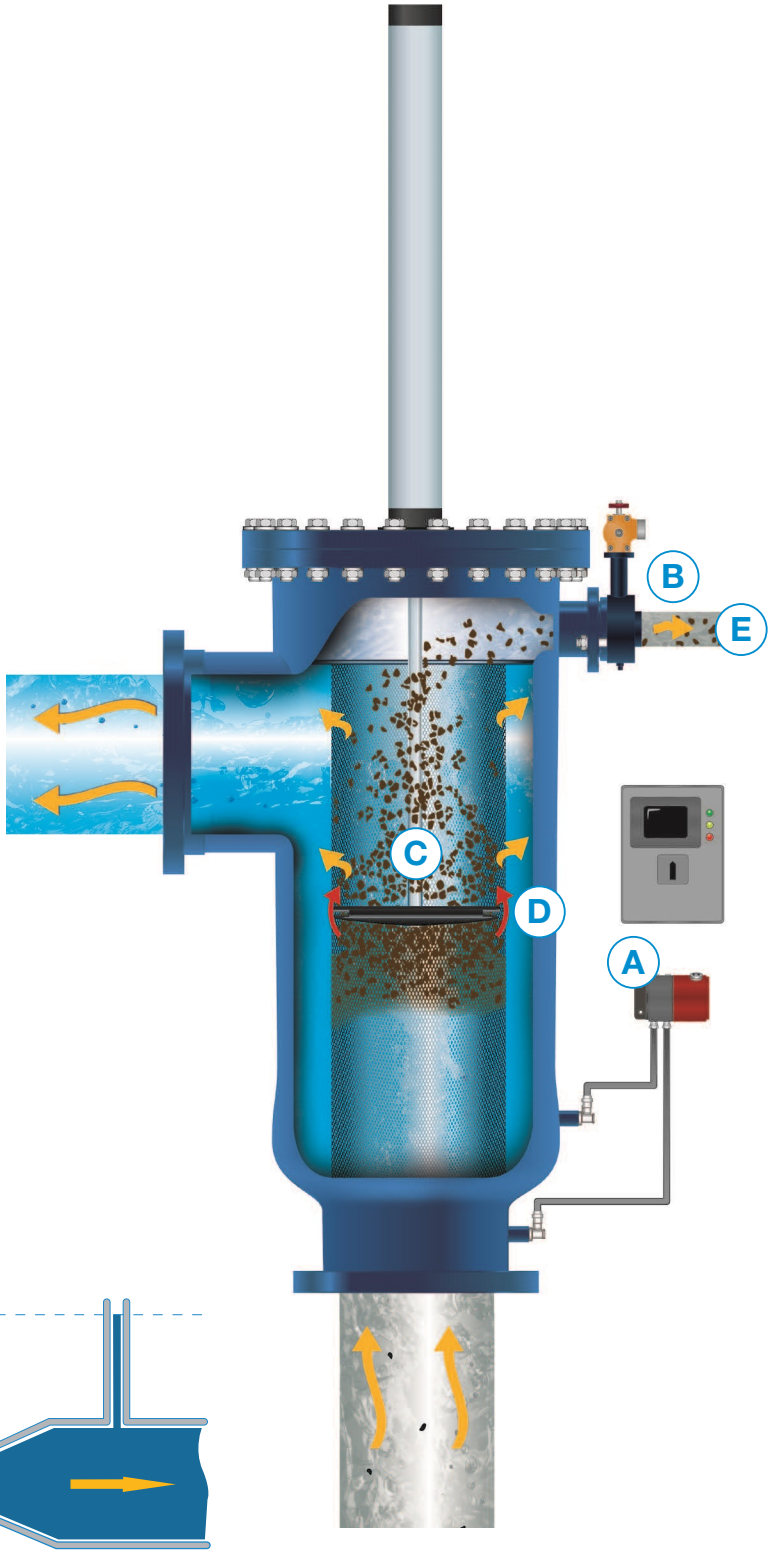
A The flushing sequence is initiated by a timer setting or triggered by a differential pressure sensor before any blockage of the filter basket causes flow reduction.

B In the pre-flushing stage, the flushing valve opens and larger particles are flushed out.

C During the flushing sequence, a specially shaped flushing disc mounted on a pneumatic cylinder enters the filter basket and creates a gap between the disc and the filter basket.

D As the flow velocity increases locally around the disc, the static pressure is reduced in accordance with the Bernoulli Principle and the direction of the flow is reversed, thus releasing particles which are stuck to the surface of the filter basket.

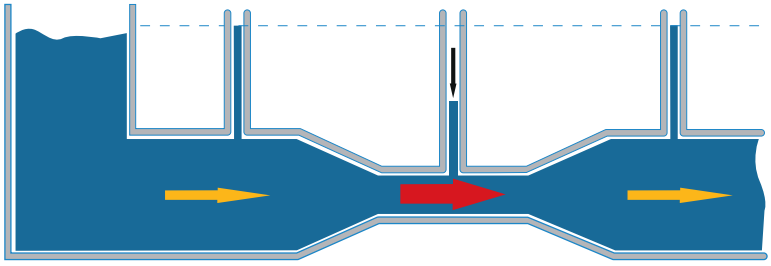
E The released particles are led out from the filter through the flushing outlet.



The Bernoulli Principle

The Bernoulli Principle states that for an inviscid flow, an increase in the speed of the fluid occurs simultaneously with a decrease in pressure.

$$P_1 + \frac{u_1^2}{2}\rho + \rho g h_1 = \text{const}$$



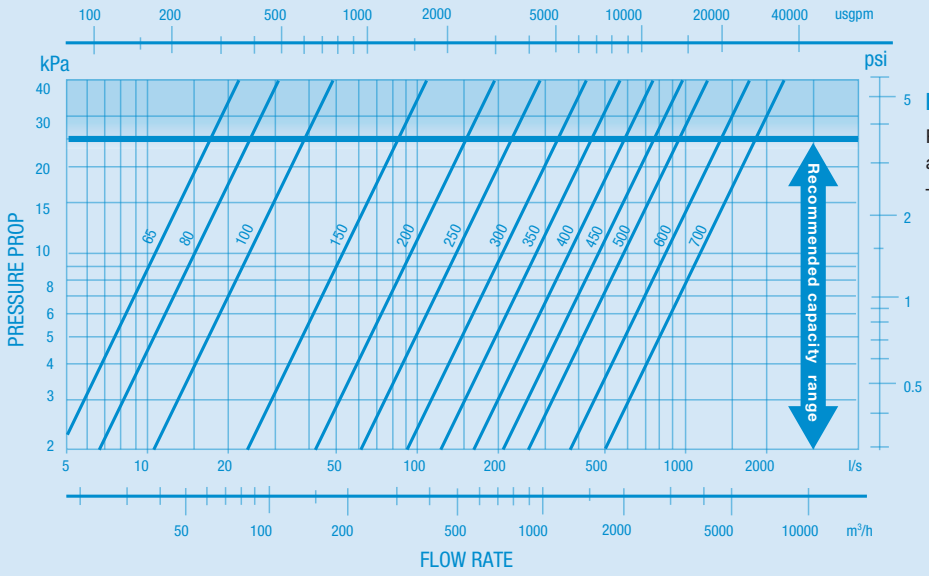
Velocity low
Static pressure high

Velocity high
Static pressure low

Velocity low
Static pressure high

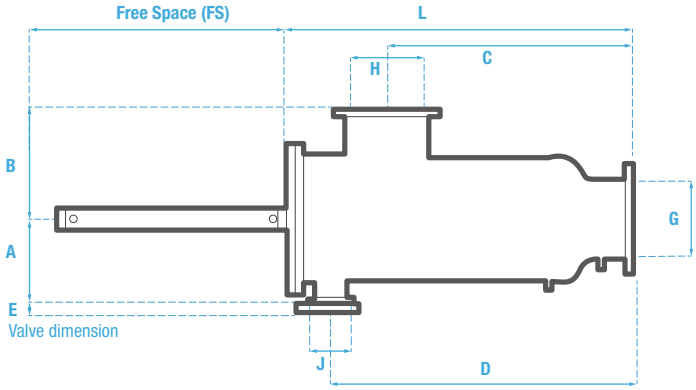
TECHNICAL DATA – SELF-CLEANING INDUSTRIAL FILTERS

SELECTION CHART



Example

Recommended filter size at a flow rate of 500 m³/h – DN 200 or DN 250.



OPERATING SPECIFICATIONS

Min. operating pressure	≥ 0,3 bar[1]
Max. operating pressure	10 bar (g)
Max. operating temp.	VBP: 40°C / VBG: 60°C[2] / VBS: 80°C
Power supply	100-240V AC or DC 45-65 Hz (AC)
Instrument air pressure	min 6 bar g

[1] Minimum operating pressure during flushing, depends on filter size.

[2] Alternative maximum operating temperatures are available upon request.

DIMENSIONS

Filter type	Flow capacity		Dimensions (mm)									
	Max (l/s)	Flush (l/s)	A	B	C	D	E	L	FS	G/H	J	Weight (kg)
FILTER BODY IN PVC												
VBP 65	17	2	96	205	295	380	built in	460	330	DN 65	BSP 1"	12
VBP 80	23	3	180	235	380	485	150	630	430	DN 80	DN 40	17
VBP 100	36	4	185	275	440	550	150	720	450	DN 100	DN 40	24
FILTER BODY IN GRP												
VBG 100	36	4	185	200	385	495	212	630	450	DN 100	DN 40	18
VBG 150	83	9	240	275	530	675	212	820	590	DN 150	DN 40	40
VBG 200	145	17	310	350	705	890	292	1060	790	DN 200	DN 65	60
VBG 250	235	26	350	400	825	1050	52	1260	940	DN 250	DN 100	105
VBG 300	325	37	400	475	1000	1260	52	1480	1110	DN 300	DN 100	160
VBG 350	450	50	400	475	1100	1380	52	1610	1250	DN 350	DN 100	180
VBG 400	580	67	450	600	1240	1540	52	1790	1370	DN 400	DN 100	300
VBG 450	735	77	500	650	1450	1800	56	2030	1640	DN 450	DN150	500
VBG 500	910	105	600	700	1600	2050	56	2340	1860	DN 500	DN 150	550
VBG 600	1300	150	650	900	1800	2250	56	2620	2060	DN 600	DN 150	850
VBG 700	1770	200	750	850	2250	2780	60	3170	2450	DN 700	DN 200	1300
FILTER BODY IN AISI 316L												
VBS 80	23	3	165	165	340	455	90	570	430	DN 80	BSP 1¼"	30
VBS 100	36	4	200	175	350	465	115	590	410	DN 100	BSP 1½"	37
VBS 150	83	9	250	250	500	650	115	770	610	DN 150	BSP 1½"	90
VBS 200	145	17	275	300	630	820	155	970	780	DN 200	BSP 2½"	140
VBS 250	235	26	325	350	750	975	52	1150	940	DN 250	DN 100	210
VBS 300	325	37	380	380	900	1160	52	1350	1100	DN 300	DN 100	270
VBS 400	580	67	460	450	1050	1360	52	1570	1370	DN 400	DN 100	550

STANDARD DESIGN SPECIFICATIONS

Design code	EN 13121 / ASME VIII, Div 1 / ASME X
Flange standard	DIN 2632 PN10 / ANSI B 16.5 lbs 150
Filter body material	BSP: PVC / VBG: GRP / VBS: AISI 316L
Filtration range	0.1–1.0 mm Wedge wire 1.0–2.0 mm Perforated
Filter basket material	Stainless steel (316, Duplex, Super-duplex) / Titanium
Control panel	PLC

VAN BORSELEN FILTERS BV
Postbus 3 2700 AA Zoetermeer
Argonstraat 66 2718 SN Zoetermeer
Telefoon +31 (0)79 3412314
Telefax +31 (0)79 3412892
Email info@vanborselen.nl

www.vanborselen.nl