

BERNOULLI

CENTRIFUGAL SEPARATORS

Advantages of centrifugal separators from Bernoulli System

- Separation efficiency does not depend on vertical or horizontal position
- Separation occurs without any interruption to the flow
- Very little liquid is lost by purging
- No need for any consumable material
- Zero maintenance



Innovative centrifugal separation solutions

Over twenty years ago, Bernoulli System patented its first automatic filter, the Bernoulli Filter. This ingeniously simple, unique filter solution was designed to satisfy the needs of a particular niche in the filtration segment. Approximately ten years ago, with the aim of broadening our offer to the filtration market, centrifugal separators were added to the product portfolio. The basic principle of a centrifugal separator is to remove settle-able solids (such as sand) from liquids.

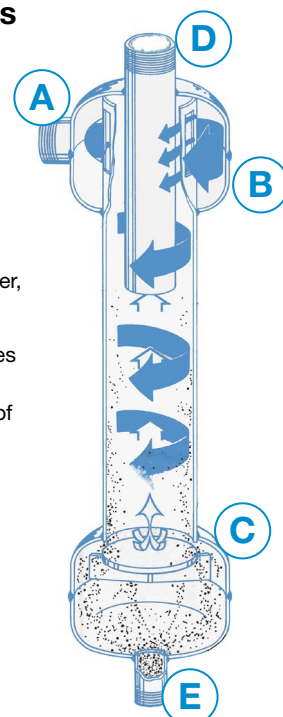
Centrifugal separators

A centrifugal separator is not actually a filter since there is no screen element inside to filter out the particles. The separation is instead ensured by means of centrifugal force, and the separator's efficiency is directly proportional to the specific density and size distribution of the particles. The centrifugal separator eliminates 98% of all particles with a specific gravity of 2.6-2.8 (such as sand) down to a size of 75 microns, provided that the pressure loss over the unit is minimum 0.3 bar.

Centrifugal separators should be installed downstream of the feed pump in order to ensure enough pressure during purging, and to overcome the pressure drop over the unit.

Working principle

- A liquid containing particles is fed tangentially into the cylindrical top of the centrifugal separator to create rotation. By passing through slots in the intake chamber, the flow velocity is further accelerated.
- The centrifugal force moves heavy particles to the sides of the barrel. They are then pushed downwards and accumulated in the collection chamber in the bottom of the separator.
- A deflector plate, located in the top of the collection chamber, changes the direction of flow.
- Solid-free liquid move upwards around the vortex and exit via the separator's top outlet.
- The separated solids are either periodically or continuously purged from the collection chamber.



PRODUCT LINES



CPW

The CPW product line consists of the smallest centrifugal separators, in five sizes ranging from DN15 to DN40 and covering capacities up to 16 m³/h. The CPW product line is particularly interesting in applications with aggressive liquids, since the material of construction is HD polyethylene. The CPW operating pressure range is 1-8 bar(g) at 40°C.



CXW

The CXW product line consists of ten models in sizes DN 10-100, covering capacities from as low as 0.7 m³/h up to 90 m³/h. This range comes in three different materials: carbon steel (CKW), stainless steel AISI 304 (CRW) and stainless steel AISI 316 (CSW). The CXW operating pressure range is 1-12 bar(g) at ambient temperature. The CXW is available in dismantlable models.



CXWV

The CXWV product line covers the upper capacity range, from 65 m³/h to 2700 m³/h, with ten models in sizes DN 100-500. It comes in three different materials: carbon steel (CKWV), stainless steel AISI 304 (CRWV) and stainless steel AISI 316 (CSWV). The mounting position is vertical, and to support it, legs are included. For smaller sizes up to DN250, the operating pressure range is 1-10 bar(g) at 80°C. The larger sizes achieve 1-10 bar(g) at 40°C in standard operation. A variant of the CXWV product line permits the intake chamber to be dismantled.



CXWL

The CXWL product line is the near twin of the CXWV product line. The only difference is that they have leaning support legs to support installations with height limitations. Available sizes are DN 100-500, with capacities of up to 2700 m³/h. The CXWL product line comes in three different materials: carbon steel (CKWV), stainless steel AISI 304 (CRWV) and stainless steel AISI 316 (CSWV). For the smaller sizes up to DN250, the operating pressure range is 1-10 bar(g) at 80°C, whereas the larger sizes achieve 1-10 bar(g) at 40°C in standard operation. Like the CXWV product line, the CXWL is available in dismantlable models.

MATERIAL	SPECIFIC GRAVITY (kg/dm³)
Aluminium	2.7
Ashes (cCoal)	2.0
Brass	9.0
Bronze, Copper	8.9
Carbon, Concrete, Lava	1.8-2.5
Coal (Anthracite)	1.3-1.9
Earth (Silt, Soil)	1.2-2.0
Glass (Crystal)	3.0
Granite, Gravel	2.5-3.0
Graphite	2.3
Iron	7.8
Lead	11.3
Limestone	2.8
Manganese	7.4
Nickel	8.9
Sand, Silica, Shale	2.6-2.8
Steel	7.8
Tin Ore	6.4-7.0

Purge system

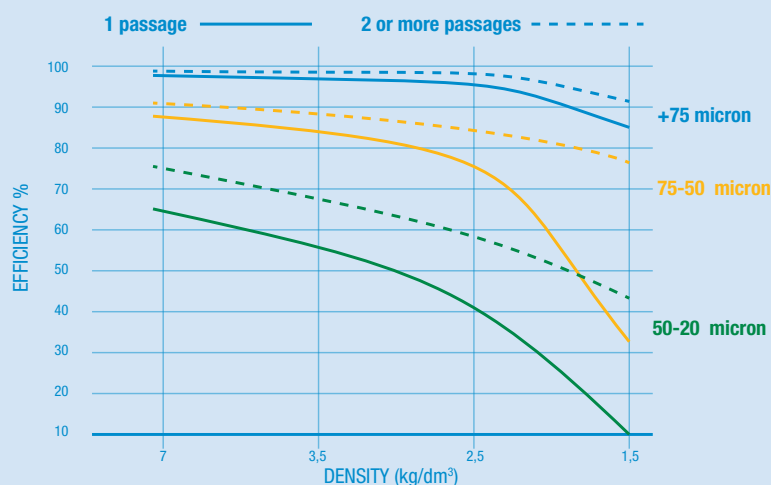
To drain off the suspended solids accumulated in the collection chamber of the centrifugal separator, either a manual discharge drain or an automatic discharge system can be used. Both are available from Bernoulli System. For the automatic discharge system, purging intervals and duration can both be easily adjusted. The automatic discharge system comes in two versions: electrical and pneumatic. Both purge systems include a ball valve, an actuator and a time controller. The manual discharge drain consists of a ball valve with a hand lever.

Applications

A centrifugal separator can be used in a wide range of applications - from protection of nozzles and heat exchangers to pre-filtration in water treatment installations. Industries such as metal production, food processing, pulp and paper, chemicals, and oil and gas all employ centrifugal separators.

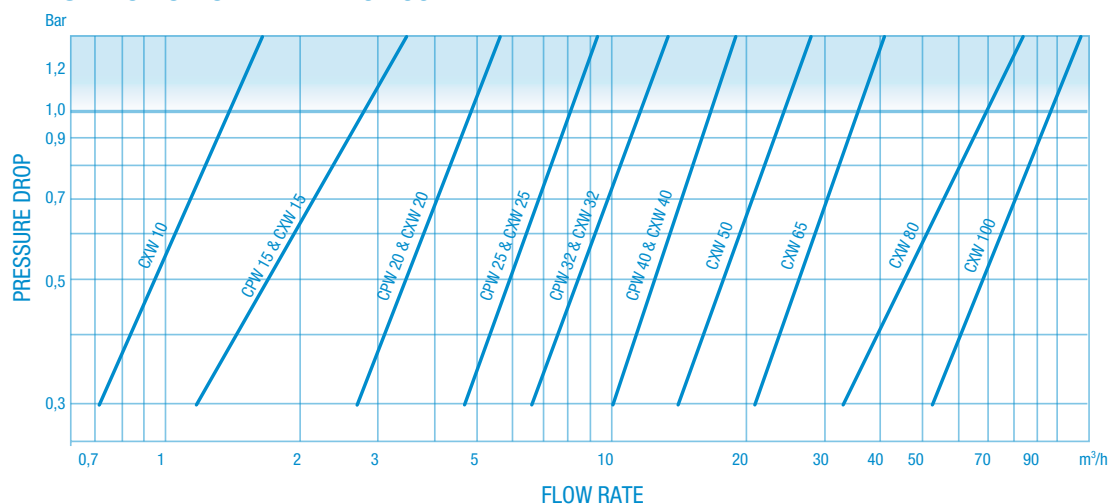
CENTRIFUGAL SEPARATORS DN 10-100

SEPARATING EFFICIENCY



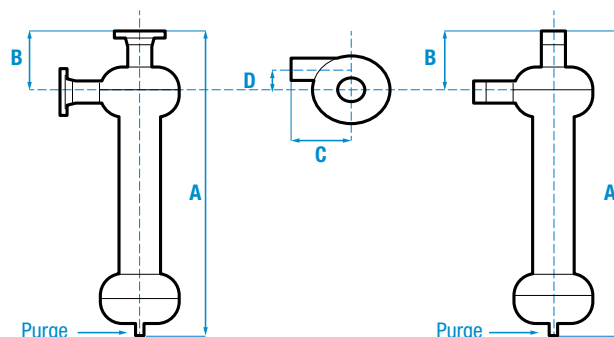
The given indications of separation efficiencies are a combined result of theoretical calculations and in field experience. Expected separation efficiency may also depend on the shape of actual particles, pressure loss and other factors.

SELECTION CHART DN 10-100



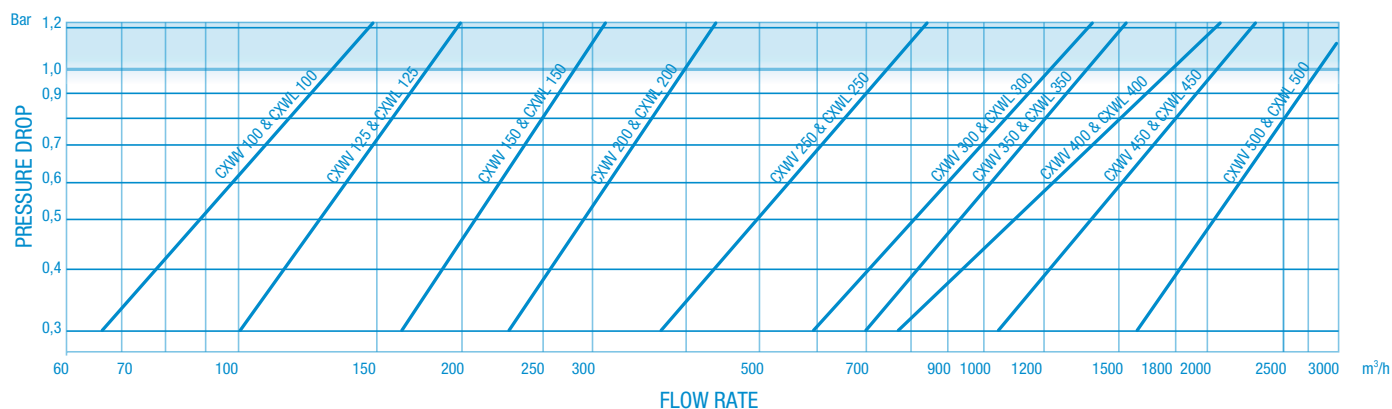
DIMENSIONS DN 10-100

Model	Capacity (m³/h)	Inlet/outlet	Purge	Dimensions (mm)				
				A	B	C	D	Weight (kg)
BODY MATERIAL STEEL X=K (CS), R (304), S (316)								
CXW 10	0.7-1.6	3/8"	3/4"	410	70	90	35	6
CXW 15	1.2-2.6	1/2"	3/4"	518	111	112	60	10
CXW 20	2.7-4.6	3/4"	3/4"	521	111	114	60	10
CXW 25	4.7-7.6	1"	3/4"	759	111	114	55	16
CXW 32	6.6-11	1 ¼"	3/4"	759	111	114	50	16
CXW 40	10-16	1 ½"	3/4"	759	111	118	50	16
CXW 50	14-23	2"	3/4"	800	119	140	70	29
CXW 65	21-34	DN 65	3/4"	838	125	185	65	35
CXW 80	33-65	DN 80	3/4"	1000	162	210	75	40
CXW 100	52-90	DN 100	1 ½"	1105	270	310	75	55
BODY MATERIAL HD POLYETHYLENE								
CPW 15	1.2-2.6	1/2" Int	3/4" Int	500	111	130	60	2.0
CPW 20	2.7-4.6	3/4" Int	3/4" Int	500	111	130	50	2.0
CPW 25	4.7-7.6	1" Int	3/4" Int	750	111	130	50	2.1
CPW 32	6.6-11	1 1/4" Int	3/4" Int	760	111	140	50	2.5
CPW 40	10-16	1 1/2" Int	3/4" Int	760	111	140	50	2.6



CENTRIFUGAL SEPARATORS DN 100-500

SELECTION CHART DN 100-500



DIMENSIONS DN 100-500

Model	Capacity (m³/h)	Inlet/outlet	Purge	Dimensions (mm)								Weight (kg)
				A	B	C	D	E	F	G	H	
VERTICAL CENTRIFUGAL SEPARATOR X=K (CS), R (304), S (316)												
CXWV 100	65-130	DN 100	1 1/2"	1540	410	300	80	–	300	–	210	210
CXWV 125	100-180	DN 125	1 1/2"	1945	480	355	94	–	300	–	250	280
CXWV 150	170-270	DN 150	1 1/2"	1945	480	355	94	–	300	–	250	305
CXWV 200	235-385	DN 200	1 1/2"	2335	625	400	199	–	300	–	300	390
CXWV 250	380-700	DN 250	2"	2580	760	505	143	–	300	–	350	575
CXWV 300	590-1150	DN 300	2"	2780	870	545	143	–	300	–	400	700
CXWV 350	700-1300	DN 350	2"	3180	970	650	200	–	300	–	450	995
CXWV 400	900-1700	DN 400	DN 80	3800	825	660	260	–	600	–	510	1100
CXWV 450	1200-2100	DN 450	DN 80	3980	920	700	270	–	600	–	570	1300
CXWV 500	1800-2700	DN 500	DN 80	4500	1010	810	280	–	600	–	645	1700
LEANING CENTRIFUGAL SEPARATOR X=K (CS), R (304), S (316)												
CXWL 100	65-130	DN 100	1 1/2"	1129	315	260	19	1607	510	1120	251	210
CXWL 125	100-180	DN 125	1 1/2"	1319	412	305	27	2095	510	1475	310	280
CXWL 150	170-270	DN 150	1 1/2"	1319	412	305	27	2095	510	1475	310	305
CXWL 200	235-385	DN 200	1 1/2"	1518	519	368	38	2377	510	1596	400	390
CXWL 250	380-700	DN 250	2"	1721	632	450	51	2755	510	1684	601	575
CXWL 300	590-1150	DN 300	2"	2100	750	460	60	3300	600	2060	660	700
CXWL 350	700-1300	DN 350	2"	2400	850	620	70	3650	600	2340	700	995
CXWL 400	900-1700	DN 400	DN 80	3000	1020	660	40	4020	1000	2760	750	1100
CXWL 450	1200-2100	DN 450	DN 80	3100	1150	700	80	4590	1000	2900	810	1300
CXWL 500	1800-2700	DN 500	DN 80	3390	1220	810	100	5075	1000	3300	875	1700

