BOLLFILTER
Protection Systems

Marine & Power

Progress by Innovation

BOLL Automatic Filter
TYPE 6.18.2 BWT
Application Study

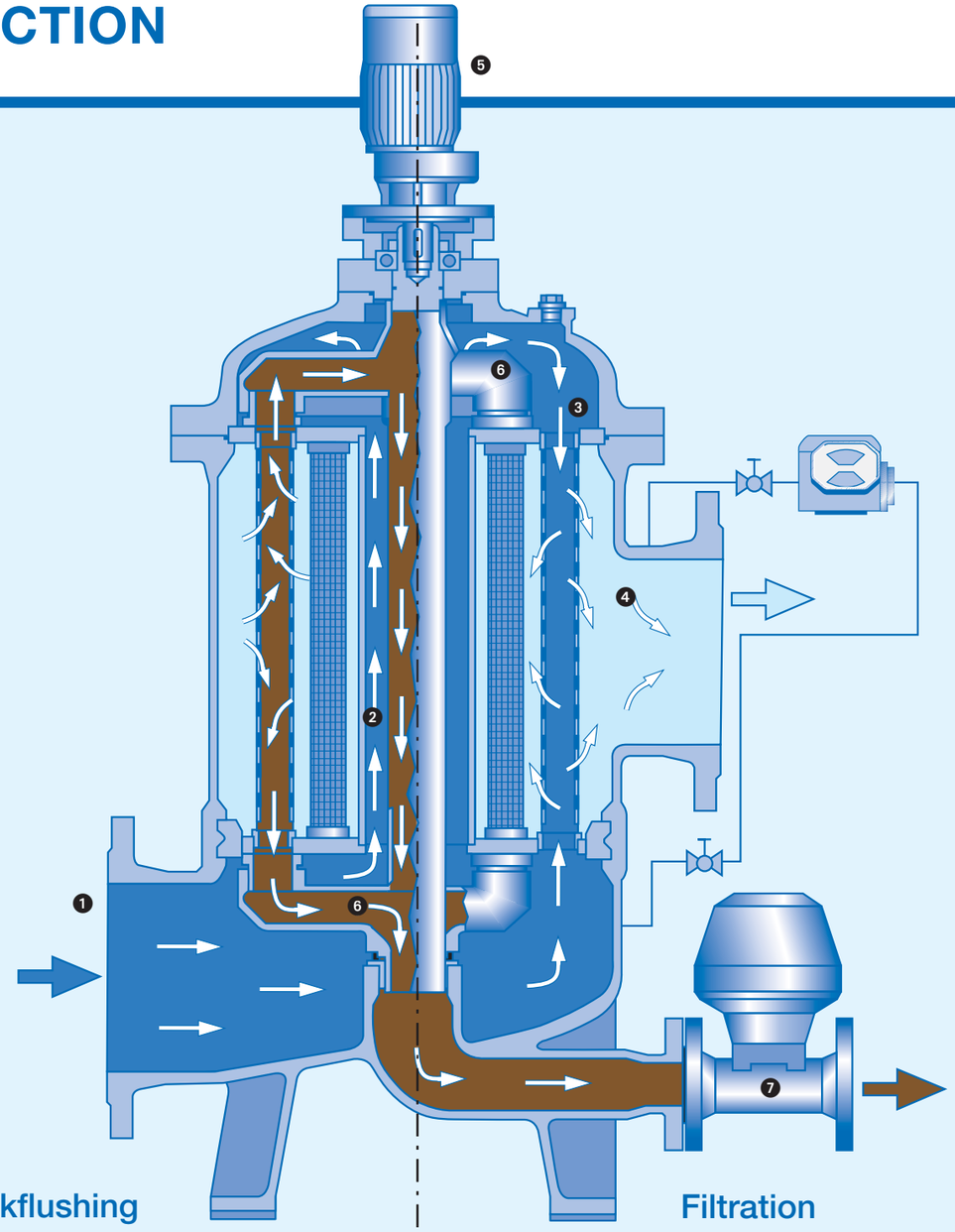
Mechanical pre-filtration of sea water for the protection of ballast water treatment systems

ROBUST TECHNOLOGY TO MEET TOUGH DEMANDS:
HEAVY DUTY FILTER CONSTRUCTION

Even when faced with extreme conditions the BOLL Automatic Filter TYPE 6.18.2 BWT can deal with it without the risk of malfunctioning. One of the key reasons for this is that the filter is equipped with ultra robust bipolar filter candles. These are open at both ends and the water to be filtered flows through the

candles from both ends. Due to their length and increased diameter the filters have a particularly large surface area. A capacity of 3000 m³/h enables **single unit solutions** to be used, removing the need for filter batteries that take up a lot of space and are far more prone to breaking down. The capacity of the backflushing system has been specially designed to cope with the high filtration capacity of the system. By this, an excessive blocking of the filter elements is prevented.

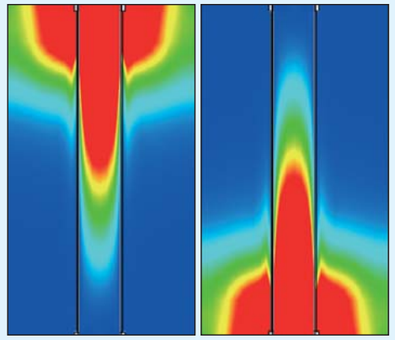
How it works



When the pump is switched on, the water to be filtered enters the filter housing through the inlet flange 1. Part of the unfiltered water is fed into the upper half of the filter via the riser pipe 2 into the filtration unit. From there it is fed into the filter candles 3 from above. In this manner water flows into both ends of the filter candle. Organic and anorganic particles are retained inside the candle. Cleaned water leaves the candle again through the slots in the candle and is fed to the filter outlet 4.
During the backflushing process (which is actuated either by differential pressure or time) the filter candles are cleaned one after the other without interrupting the filtering process. For this purpose the gear motor 5 rotates the flushing arms 6 over the individual candles simultaneously the discharge valve 7 is opened. The pressure difference between clean and dirt side results in a reverse flow of clean medium through the filter candle which removes organic and anorganic particles. The particles are then washed out of the filter by the water flowing along the length of the candle.

Recipe for constant high performance: Bipolar filtering, bipolar backflushing

The BOLL Automatic Filter TYPE 6.18.2 BWT utilizes the tried and tested bipolar filtration method in conjunction with an effective bipolar backflushing function. Rotating flushing arms are fitted both above and below the filter unit. The filter candles are cleaned alternately from above and below with the filtrate fluid without interrupting filtration.



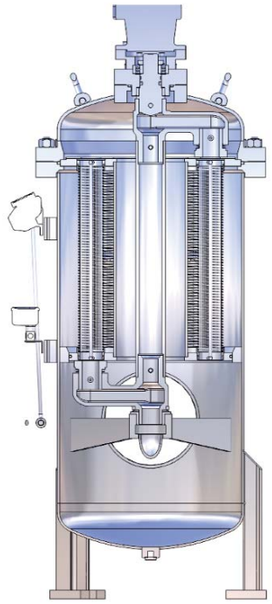
Flushing speed simulation of the bipolar backflushing function: The filter candles open at both ends are cleaned alternately from above and below.

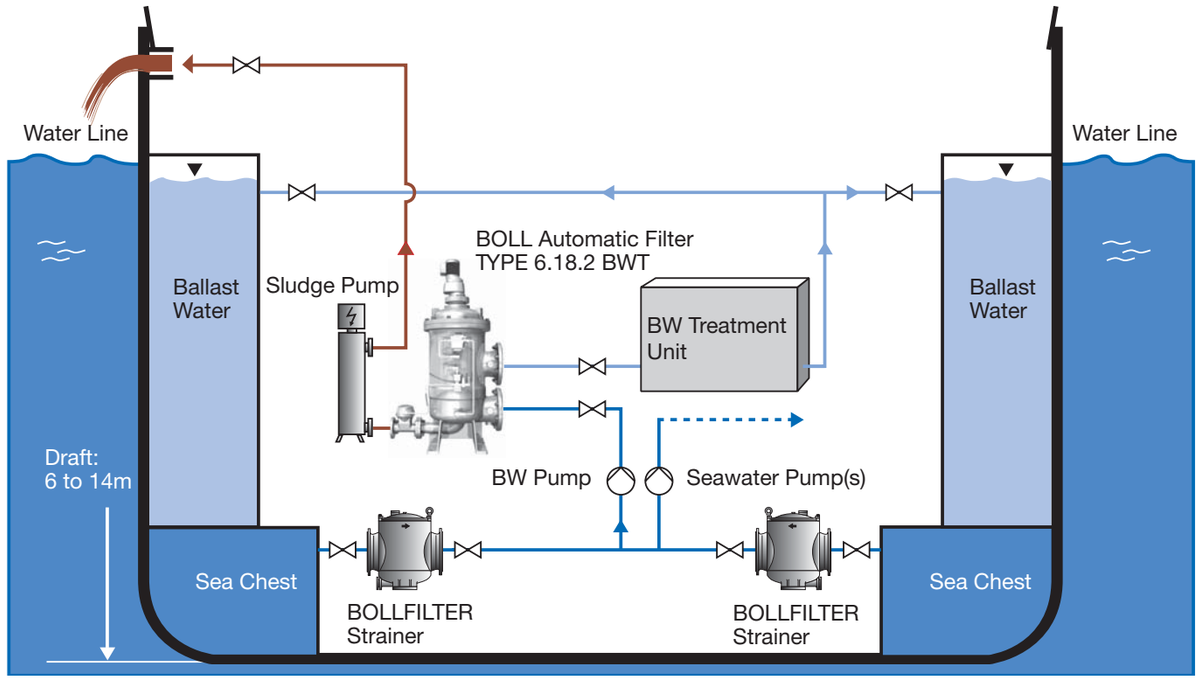
Due to the high flow speeds that this generates, the filter candles are cleaned particularly thoroughly. In conjunction with the large quantities of discharge used for cleaning purposes, the bipolar backflushing method ensures **maximum performance at maximum speed**.

BALLAST WATER FILTRATION:
A TASK FOR BOLLFILTER

BOLLFILTERs have been the first choice for filtering fuel and lubricants at sea for decades. BOLLFILTERs have also been in the forefront of water filtration systems on land based applications in areas like water and sewage treatment as well as heavy industries.

As a result of the IMO agreement of 13th February 2004 prescribing the treatment of ballast water (BWT) on board ship as from 2009 it will soon be compulsory to have systems in place of which filtration will play an important part. Due to close involvement in the shipbuilding and shipping industries, BOLL & KIRCH have already perfected a BOLLFILTER for this new application: the BOLL Automatic Filter Type 6.18.2 BWT, a product which combines BOLL & KIRCH's two traditional areas of expertise in one filtration system. With a grade of filtration of 50 µm the filter removes both organic and anorganic particles from ballast water, preparing the water for treatment in BWT systems. Thanks to close co-operation between BOLL & KIRCH and manufacturers of BWT systems during the development phase it will be possible to incorporate the new filter 6.18.2 BWT into all available BWT systems.





How it works

The sea water destined for the BWT system initially flows through a coarse-mesh strainer before being pre-filtered by the BOLL Automatic Filter Type 6.18.2 BWT with a grade of filtration of 50 micron. The waste discharge containing organic and anorganic particles drained from the sea water is fed overboard by a suction pump attached to the filter discharge valve.

PERSUASIVE DATA FOR A PERSUASIVE PERFORMANCE

BOLLFILTER TYPE 6.18.2 BWT / Automatic filter using filtrate fluid backflushing

Quantity of ballast water	Weight of filter	Size of footprint	In- / Outlet	Integrable steam heater for disinfection
250 m³/h	400 kg	0,2 m²	DN 250	optional
500 m³/h	560 kg	0,3 m²	DN 300	optional
750 m³/h	800 kg	0,45 m²	DN 400	optional
1.000 m³/h	1.200 kg	0,65 m²	DN 500	optional
1.500 m³/h	1.400 kg	0,8 m²	DN 600	optional
2.000 m³/h	2.000 kg	0,95 m²	DN 700	optional
2.500 m³/h	2.300 kg	1,15 m²	DN 800	optional
3.000 m³/h	2.800 kg	1,55 m²	DN 900	optional

Tried and tested in practice and ready for use: The BOLL Automatic Filter TYPE 6.18.2 BWT

As well as having all the qualities that you would expect from leading-edge BOLLFILTER technology the new BOLL Automatic Filter Type 6.18.2 BWT also has some extra features specifically designed to cater for the special needs of the shipping industry. The filter housing is made of carbon steel and only has a small footprint thanks to its compact design.

Open housing with strainer and flushing arm that rotates across the strainer - full functionality despite mussel infestation.

The filter has already undergone field-testing since 2003. Over this period neither the corrosive nature of seawater nor the organic particles that stubbornly adhere to the filter elements, nor even the fouling caused by mussel infestation inside the filter housing have affected the filter's functionality.

BACKGROUND

The IMO agreement – dates of introduction and limits

Invasive aquatic organisms are one of the four biggest threats facing the world's oceans today and they can have profound environmental, economic and health implications.
On 13th February 2004 the International Maritime Organization (IMO) signed a new treaty for monitoring and treating ballast water and sediments on ships. All ships built as from 2009 must meet the BWT standards laid down in the agreement. As from 2014 all existing ships will have to meet these standards.

The treaty prescribes the following maximum contamination levels:

- 10 viable organisms/m^3 >= 50 µm,
- 10 viable organisms/ml >= 10 µm,
- 1 cfu/100 ml vibrio cholera,
- 250 cfu/100 ml escherichia coli,
- 100 cfu/100 ml intestinal enterococci.

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