



BOLLFILTER
Protection Systems

Industry & Environment

Process

BOLL Automatic Filter
SELF CLEAN
TYPE 6.18

***bipolar,
continuous,
process-optimized***



BOLL & KIRCH Filterbau GmbH

THE TASK

Balancing Economy with Efficiency

The economic operation of modern factories, in which large volumes of **cooling water** in open or closed cooling circuits, **process water** and **waste-water** are used, places the highest requirements on the **filtration** process.

The filters used here must

- ensure through their precision that the fluid to be treated is cleaned to a defined degree,
- guarantee through their reliability the uninterrupted and faultfree operating of the complete plant and



Large-scale plants such as power stations require the shortest possible set-up and downtimes.

For further areas of application see page 7.

- contribute to keeping operating costs low through minimum maintenance and long-in-service lives.

The BOLL Automatic Filter SELFCLEAN types 6.18 and 6.19 fulfill these require-

ments in optimum fashion. With their unique bipolar mode of functioning in filter and backflush modes, they set the process quality and performance standards in the field of water filtration.

THE SOLUTION

Filter candle open at both ends

BOLL SELFCLEAN types 6.18 and 6.19 use cylindrical filter candles open at both ends with dynamic throttling at the top.

The fluid to be filtered flows via the two ends into the inside of the candles. In this way the particles of contamination to be filtered out are retained over the whole length of the inside of the candles so that the full filtering area is uniformly used. ❶

When the contamination deposited on the inside of the candle reaches a level at which cleaning of the filter becomes necessary, the backflushing process is initiated automatically. A geared motor sets the cleaning device in action. A covering arm moves over the upper, open end of the filter candle and closes it. At the same time the flushing arm at the lower end is turned and the sludge release valve is opened. In this way a high axial flow is established in the filter candle.

Simultaneously the pressure gradient that arises permits a smaller quantity of fluid to flow in reverse-flow from above through the filter candle. The rotating throttle with PTFE covering plates located at the upper end of the filter candles for deliberate cross-flow backflushing and distribution of the backflushing energy over the full length of the candle. The combination of axial-flow and cross-flow produces an optimal backflushing effect with uniform cleaning along the full length of the candle. ❷

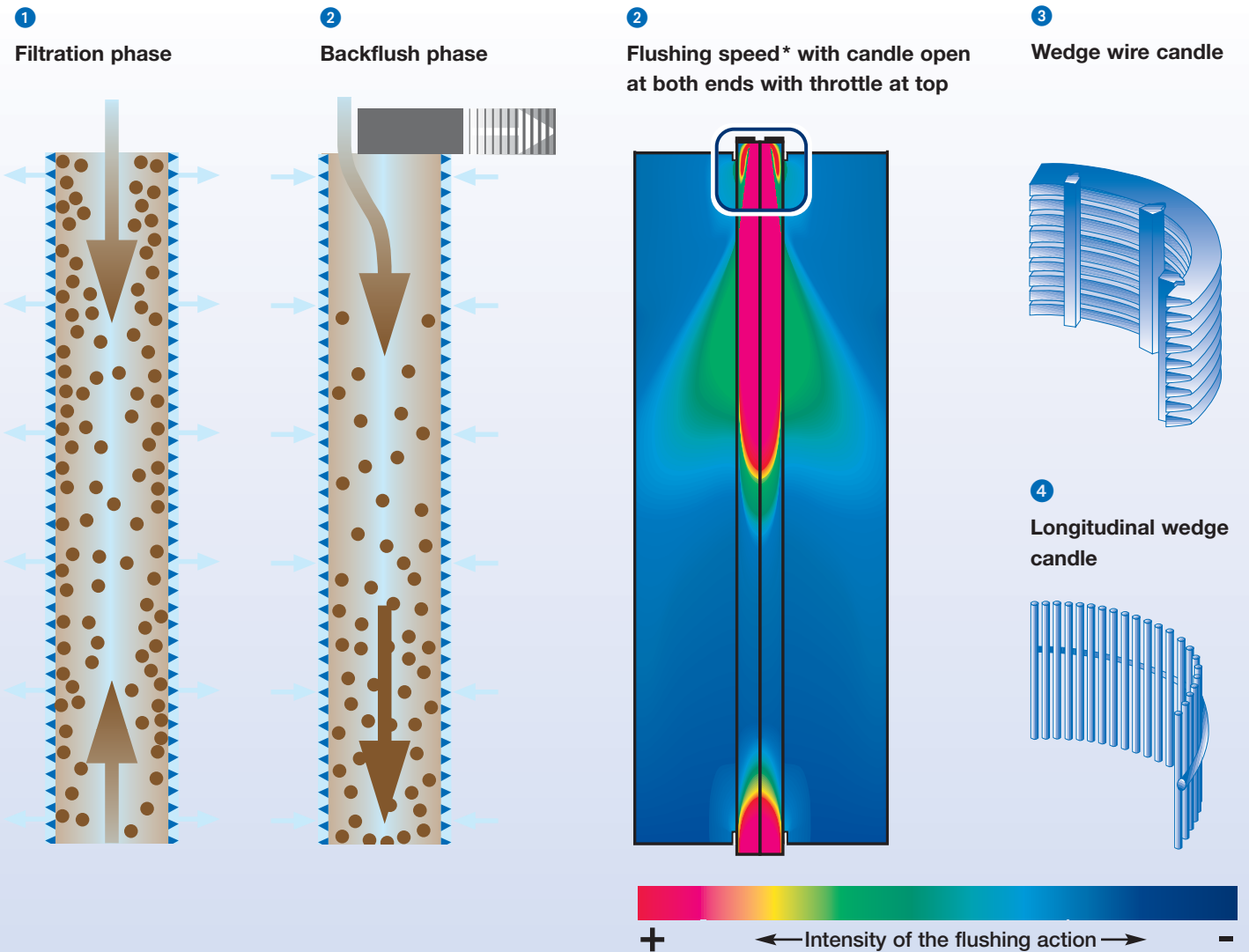
Thanks to this bipolar functional principle with cylindrical filter candles open at both ends, ❸ the BOLL 6.18 and 6.19 filters possess several advantages over filters with conical or expanding disc filter elements:

- They have to be replaced less frequently than conical ❹ and cylindrical ❺

candles, because the effective backflushing ❷ prevents the candles becoming progressively blocked. Saving both labour and spare parts costs.

- The way in which solids are separated is significantly more reliable than with expanding disc elements, because there is a danger that particles of contamination will stick in between the expanding discs ❸. At the point of changeover from backflushing to filtration, these trapped particles can be released and the defined degree of filtering will no longer be achieved.
- In contrast to conical and expanding disc filter elements, BOLL candles can be supplied with longitudinal wedge wires ❹. This produces superior cleaning results particularly with fibrous contaminants.

Filter candles open at both ends – the bipolar functional principle



Candle designs with lower flushing action

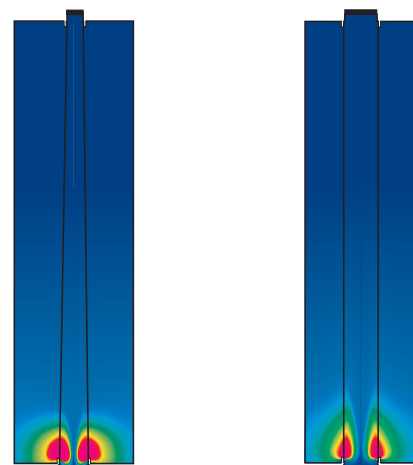
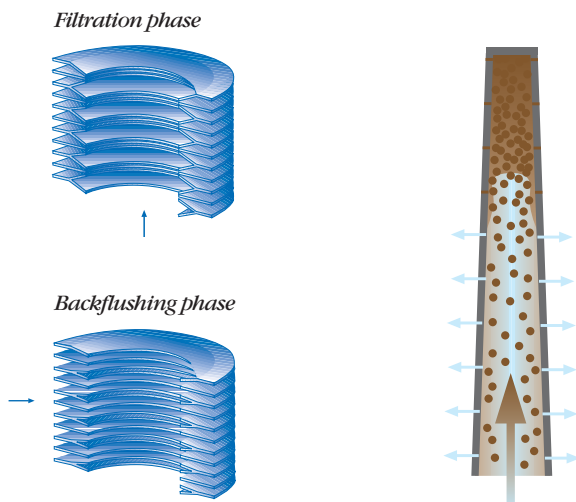
5 Expanding Disc Element

6 Conical Element

Comparison of the flushing speed* with candles closed at the top

6 Conical Element

7 Cylindrical Element



THE CONCEPT

Designed from experience to be flexible and application oriented

The precision manufactured BOLL SELF-CLEAN type 6.18 and 6.19 automatic filters are robustly constructed of a material suitable for the specific application, cast iron, carbon steel or stainless steel. Based on years of experience in this field, the design is both, simple for ease of maintenance and effective for precise filtration levels. Available in a range of sizes, connection flanges up to 9000 m³/h. The filter elements and all internal parts, connecting tubes and unions are of chrome-nickel-molybdenum steel (Cr.Ni.Mo. steel). The sole moving parts are the flushing arm ① and the covering arm ②. The plastic bushes of these are self-adjusting. The sliding bearing and the flushing bushes of plastic are sealed against contamination.

In filtering mode the fluid to be filtered reaches the lower part of the housing via the inlet flange ③. A part flow of approx. 50% of the unfiltered medium is led via the central riser pipe ④ in the filter insert

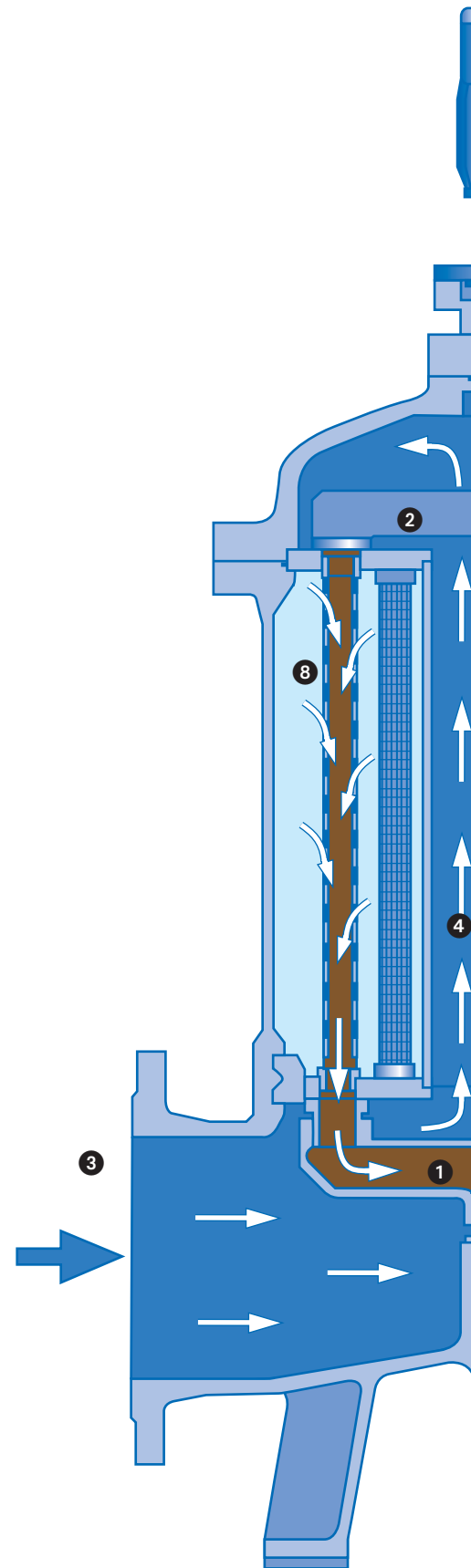
into the upper part of the housing and from there downwards into the open end of the filter elements ⑤. The other half flows from the bottom upwards into the filter element ⑥. The filtered fluid passes to the outside via the gaps ⑦ in the candle. Gap widths down to 50 microns are possible. During the backflushing cycle, the candles are cleaned one after the other without the filtration process being interrupted. The injection flow generated ⑧ prevents blocking in the upper part of the filter element. Backflushing can be carried out with the filtrate fluid (type 6.18) or an external medium (type 6.19), selection being based on the plant operating pressure. Steam or water at high pressure is used as the external medium at operating pressures of less than 2 bar or when sticky contaminants are present. Backflushing is initiated as a function of the differential in pressure ⑨ between the inlet and outlet or at programable intervals.

THE ADVANTAGES

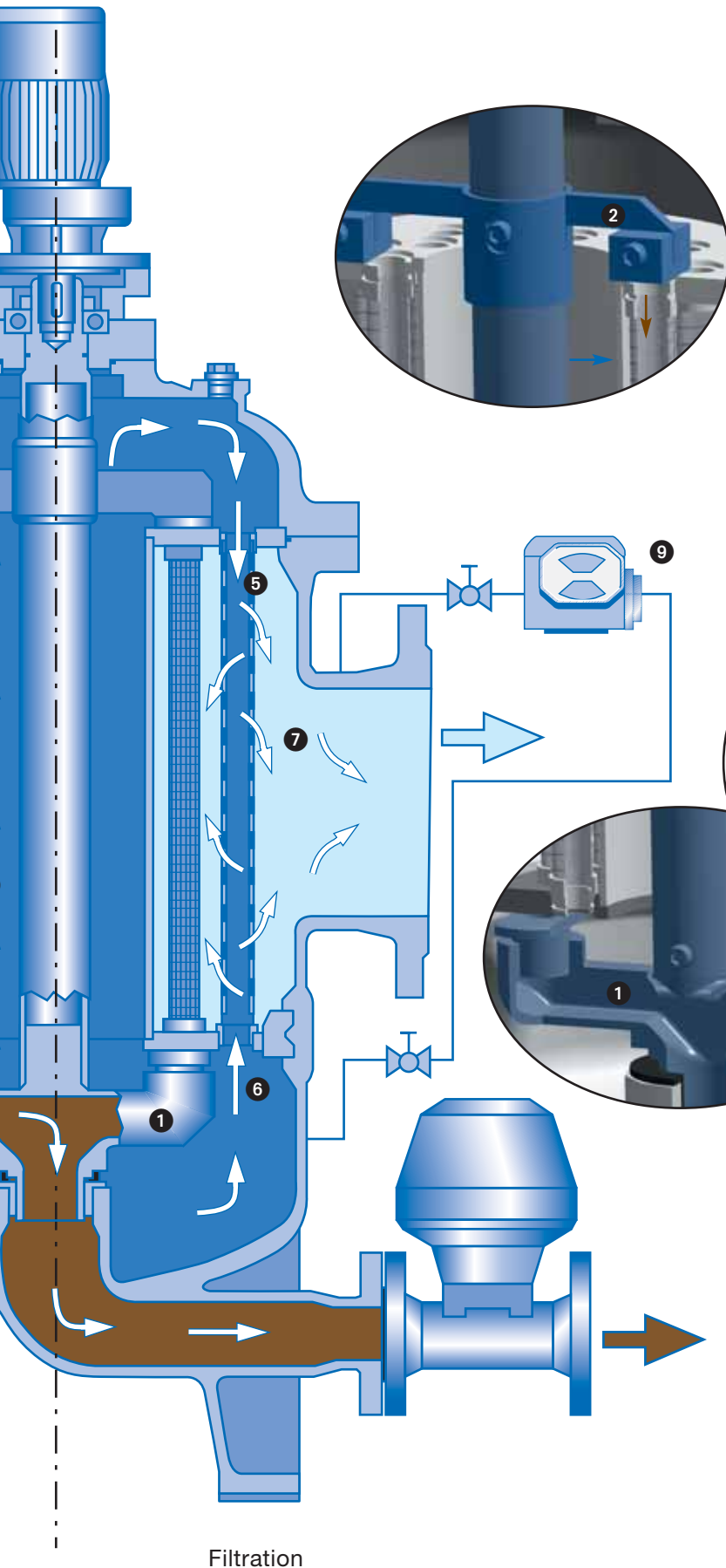
Economical and ecologically trend-setting

The economical optimum can be expressed as “as much as possible” for “as little as necessary”. For those making capital investment decisions, optimum expenditure can be expressed as either, “as little as possible” or, “as much as is necessary”. The more capital-intensive the plant and machinery, the greater the necessity for a one-off expenditure on a high quality filtering system. In existing plant too, long-term economies can be made by selecting effective and efficient filter systems. The installation of proper filtration is the mark of a progressive business.

BOLL filters protect high-value capital equipment from premature wear by filtering the dirt out of the contaminated fluid in a consistent manner and feeding the cleaned fluid back into the process again. They contribute to securing the operational reliability of the plant in a continuous and long-term manner. This saves resources while sparing the environment and reducing costs. In this way BOLL filters are the best insurance for both product and process, providing the opportunity for reinvestment, growth and profit.



Backflushing



Filtration

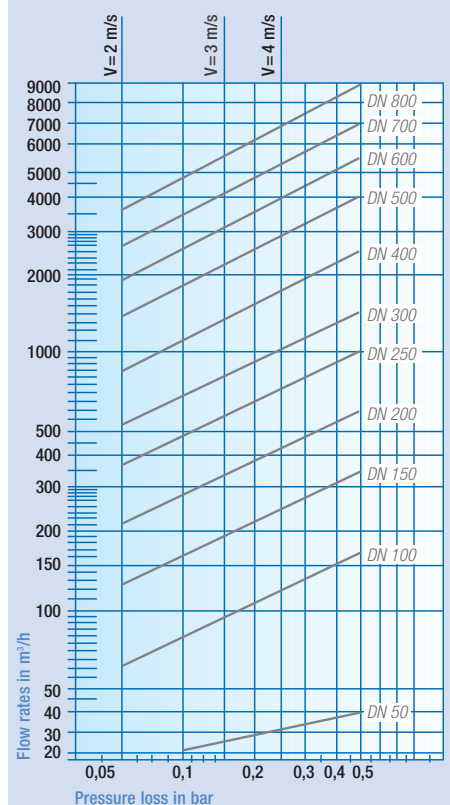


Control and Monitoring

As standard, the backflushing filter is provided with the Electronic Control Box Type 2200 which comprises the following features and functions:

- Membrane keypad with three keys
- 2-line display
- Impact-resistant display cover
- Display of backflushing operation, number of backflushes and error messages
- Adjustable over current release
- CPU board with non-volatile EPROM and program memory
- I.O. board in the control box
- Main switch with interlocking system

Flow rates of water



Of decisive importance for the design and sizing of a filter are the operational parameters. The size has to be selected on the basis of the flow rate, the degree of contamination, the filtration degree required and the permissible pressure loss in the filter. The diagram shows the flow rates with water at different nominal diameters at a filtration degree of 0.5 mm as a function of the pressure drop.

THE COMPLETE OFFER

Quality thanks to specialization

At BOLL & KIRCH, we concentrate exclusively on the design and fabrication of filters for fluids. BOLLFILTER products are the result of our own research and development and many are protected by patent. Customers can take advantage of our specialist know-how by involving BOLL & KIRCH engineers in their projects right from the earliest stages. The combination of expertise on both sides in a simultaneous engineering environment will ensure perfect results.

BOLL & KIRCH's global presence in all important industrial centres guarantees customers anywhere in the world, service of the scope and reliability they have a right to expect from a supplier of technologically sophisticated filter systems. A component of this service system is the promise that BOLLFILTER Genuine Parts will be dispatched to any part of the world within 24 hours.

Economic manufacturing on CNC and DNC controlled machine tools.

Our various stores and logistics systems underpin speedy and efficient production.

BOLLFILTER Genuine Parts leave the central warehouse within 24 hours of order.



THE DETAILS

In summary form

	SELF CLEAN Type 6.18 backflushing with filtrate fluid	SELF CLEAN Type 6.19 backflushing with external medium
Areas of application	filtration of water and emulsions	filtration of water and emulsions
Max. flow rate	9000 m ³ /h	2500 m ³ /h
Max. filter fineness	50 microns	50 microns
Nominal diameter of connection flange	50 - 900 mm	50 - 400 mm
Operating pressures	from 0 to 16 bar (higher pressures on request)	from 0 to 16 bar (higher pressures on request)
Housing material	gray cast iron casting or welded steel	gray cast iron or welded steel
Backflushing medium	filtrate fluid	external medium
Backflushing control	as function of time or differential pressure	as function of time or differential pressure
Filter candle type	cylindrical candles open at both ends	cylindrical candles open at both ends
Candle types	lateral or longitudinal wedge or wire mesh	lateral or longitudinal wedge or wire mesh
Optional accessories	dirt pump in the sludge removal line	dirt pump in the sludge removal line booster pump

Examples of areas of application for BOLL Automatic Filters

SELF CLEAN TYPE 6.18 and TYPE 6.19:



1. Chemical and petrochemical industry

- Process water
- Cooling water for production, air conditioning systems and power stations
- Fire protection



2. Sewage treatment plants

- For filtering of treated effluent for use as process water
- For filtering of effluent to be discharged into open bodies of water



3. Paper industry

- Process water
- Washing (injection) water for the paper machine



4. Offshore industry

- Injection water for oil rigs



5. Heating, refrigerating and air-conditioning systems

- Cooling water for building systems (e.g. for air-conditioning plant, computer room)



6. Mining

- Process water
- Cooling water



7. Automobile industry

- Process water, cooling water for welding shops, air-conditioning systems and power stations
- Fire extinguishing water



8. Steelworks

- Cooling water for rolling mills, skin-pass stands, heat treatment systems
- Quenching water for continuous casting lines

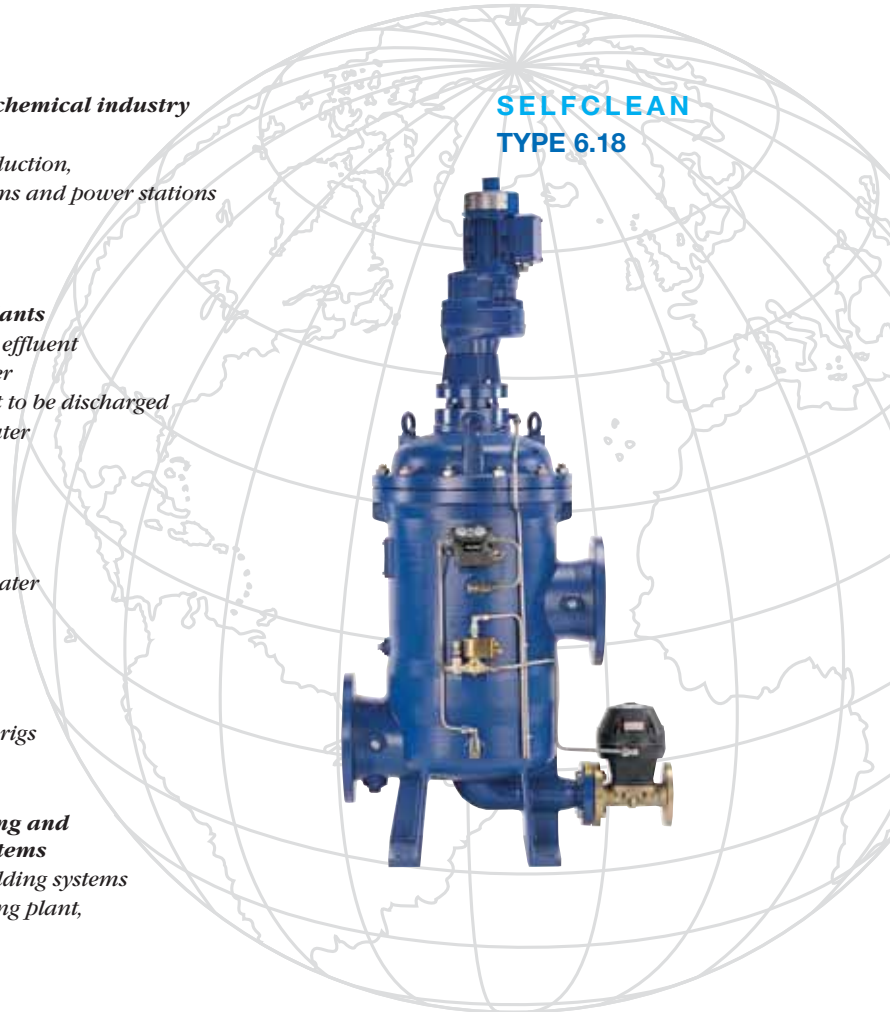


9. Artificial snow

- Operating water for snow-making machines

Power stations (see photo on page 2)

- Cooling water for turbines and oil circuits
- Sealing water for the axial face seal of the turbine shaft



SELF CLEAN
TYPE 6.18



SELF CLEAN
TYPE 6.19

BOLL Automatic Filters are characterized by the following particularly advantageous properties:

- Large filter surfaces
- Long service life
- Long maintenance intervals
- Easy and quick cleaning and maintenance
- Precisely functioning backflushing device
- Exactly defined grade of filtration thanks to precision wedge wire candles
- Modular system with many possible variants
- Effective removal of the contamination
- Simple handling
- Compact design
- Low pressure losses
- Low operating costs
- Low backflushing quantities



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