



DANGO & DIENENTHAL

Filtertechnik GmbH

Backwash Drum Filter



The Backwash Drum Filter

The New Definition of Purity for Your Medium



Cooling Water



River Water



Sea Water



Sinter and Scale Separation



Emulsions



Process Water



Mussel / Mussel Larvae Separation

Our Filter Systems Protect



Plate Heat Exchangers



Spray Nozzles



Piping Systems



Mechanical Seals



Pumps



Micro Filtration

flow rate	¹⁾ 80 m³/h to 4,000 m³/h
filter fineness	≥ 5 µm
operating pressure	1.5 to 63 bar
pressure loss with clean filter	0.1 to 0.3 bar
flange	²⁾ DN 100 to DN 1,000
temperature	– 10 to + 110 °C
automatic backwash	✓

Scope of Delivery

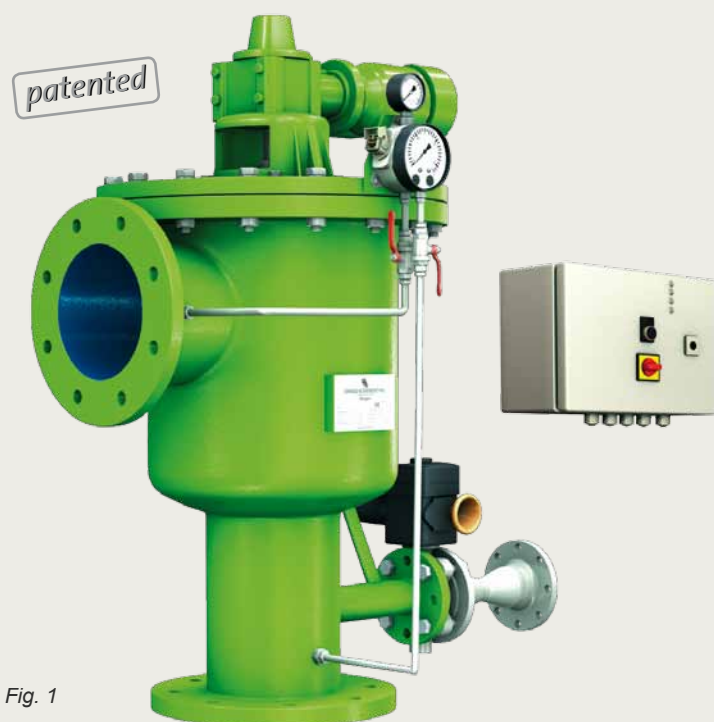


Fig. 1

voltage 230 V or 400 V	•	
voltage 110 V to 690 V		Δ
Pressure Equipment Directive (PED)	•	
ASME		Δ
explosion protection		Δ
differential pressure gauging	•	
differential pressure as 4 - 20 mA - signal		Δ
automatic filter control	•	
self-medium backwash	•	
external medium backwash		Δ
backwash with suction pump		Δ
electric or pneumatic backwash valve	•	
signal exchange with PLC	•	
electrical cabling incl. connectors	•	
documentation	•	
certificates	•	Δ
functional test at manufacturer's works	•	
included in the scope of delivery	•	
available at extra charge		Δ

	standard design	sea water resistant design	special design
filter housing	steel, stainless steel	stainless steel, GRP	GRP
filter element	stainless steel	stainless steel	stainless steel

¹⁾ for smaller flow rates the RTF-S is applicable

²⁾ for smaller flange dimensions the RTF-S is applicable

Filtration Process

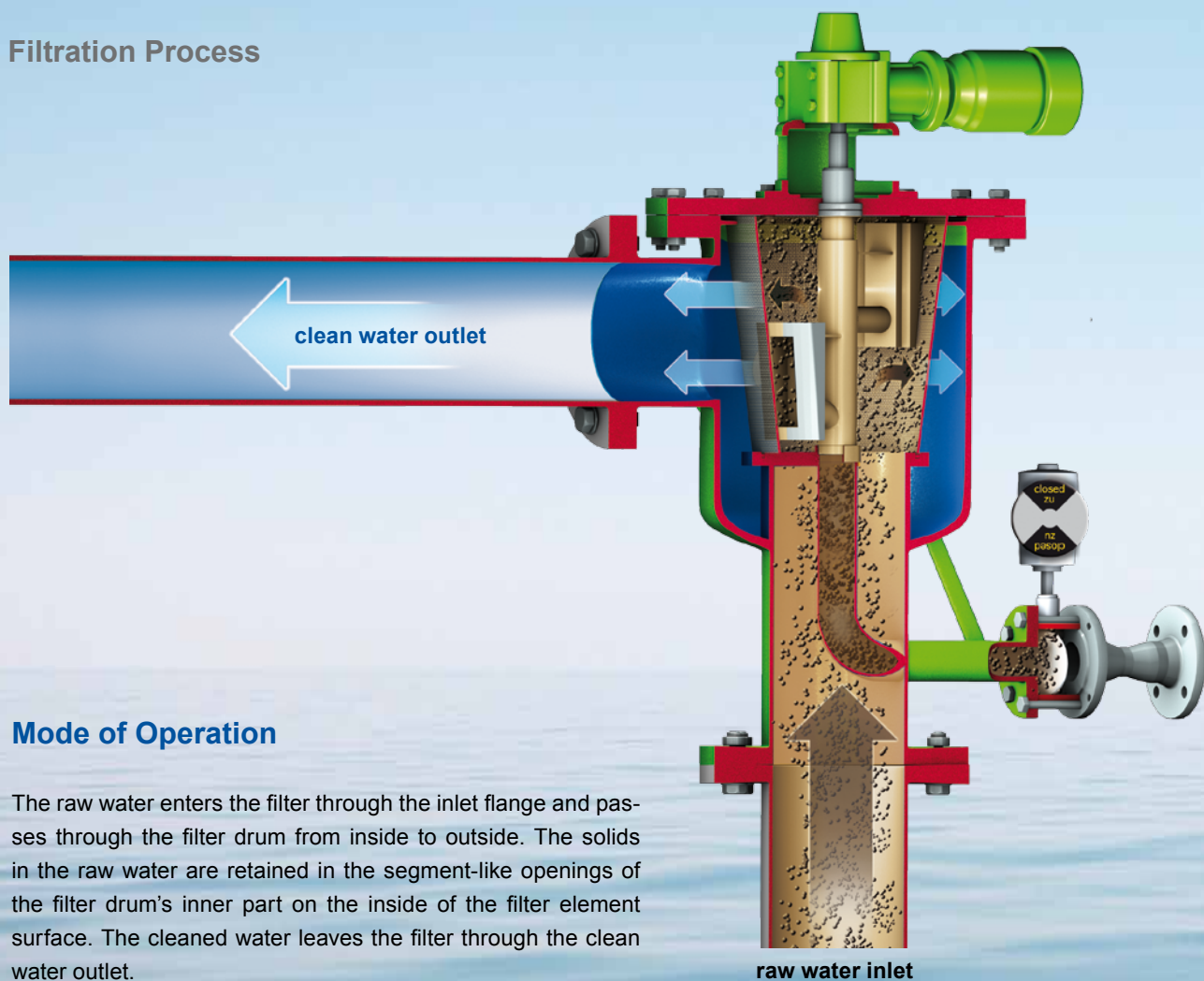


Fig. 2

Mode of Operation

The raw water enters the filter through the inlet flange and passes through the filter drum from inside to outside. The solids in the raw water are retained in the segment-like openings of the filter drum's inner part on the inside of the filter element surface. The cleaned water leaves the filter through the clean water outlet.

Backwash Process

A differential pressure measurement between raw water inlet and clean water outlet determines the degree of pollution on the filter element. At a defined differential pressure the backwash process is activated.

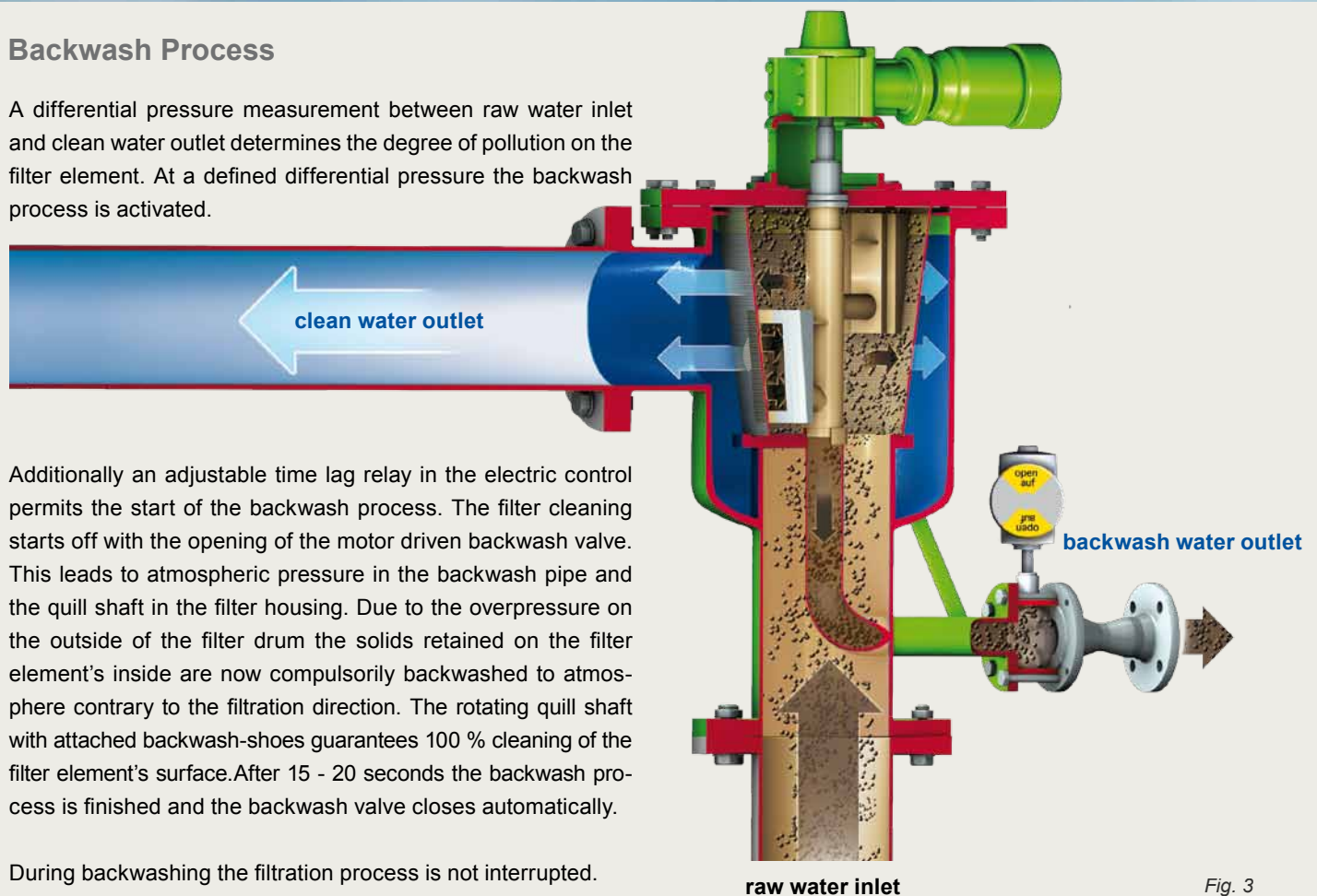
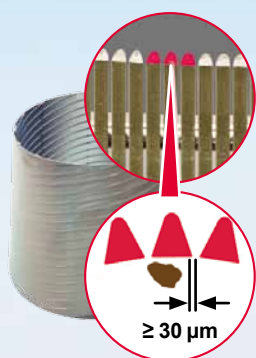


Fig. 3

Additionally an adjustable time lag relay in the electric control permits the start of the backwash process. The filter cleaning starts off with the opening of the motor driven backwash valve. This leads to atmospheric pressure in the backwash pipe and the quill shaft in the filter housing. Due to the overpressure on the outside of the filter drum the solids retained on the filter element's inside are now compulsorily backwashed to atmosphere contrary to the filtration direction. The rotating quill shaft with attached backwash-shoes guarantees 100 % cleaning of the filter element's surface. After 15 - 20 seconds the backwash process is finished and the backwash valve closes automatically.

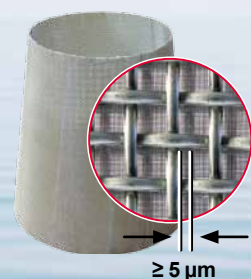
During backwashing the filtration process is not interrupted.



Filter Element

The Slotted Sieve

- on the basis of welded stainless steel triangular support rods
- very sturdy design
- manufacturable in different stainless steel qualities
- filter fineness $\geq 30 \mu\text{m}$



The Wire-Cloth Screen

- the cloth is clamped in sandwich structure by two supports
- better utilization of the net filter area
- manufacturable in different stainless steel qualities
- filter fineness $\geq 5 \mu\text{m}$

Fig. 4



Fig. 5

Filter Drum

The filter drum consists of two rigid supporting cages, one in another. The filter element is placed between these cages. Because of their conical construction all three parts can be precisely fixed and screwed together. Even rougher parts can be retained in the segment-like openings of the filter drum's inner part. During backwashing these are then flushed out of the system.

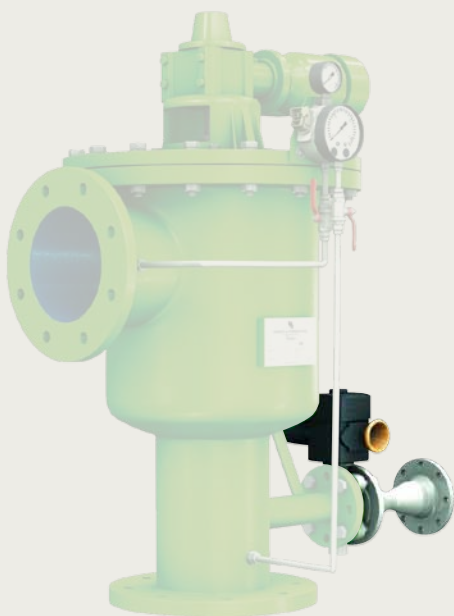


Fig. 6

Venturi Nozzle and Backwash Valve

The venturi nozzle is dimensioned according to the conditions at site for regulating the necessary backwash water amount and for avoiding pressure fluctuations in the piping system. As standard the backwash valve is equipped with an electric or a pneumatic drive.



Fig. 7

Differential Pressure Gauging

Consisting of:

- optical inlet-pressure indicator
- optical indicator of the differential pressure
- 2 adjustable micro-switches
- start filter backwash
- alarm signal



Range of Application



Fig. 8 cooling water filtration in plastics industry



Fig. 9



Fig. 10

Electric Control

The backwash process is started off time and / or differential pressure controlled and allows for a fully automatic filter operation.

The standard control includes the following signal exchanges with the customer's control system (PLC):

- collective fault indication
- ready for operation
- filter is backwashing
- external starting of the backwash process
- external release of the backwash process

Performance Chart for 400 µm filter fineness

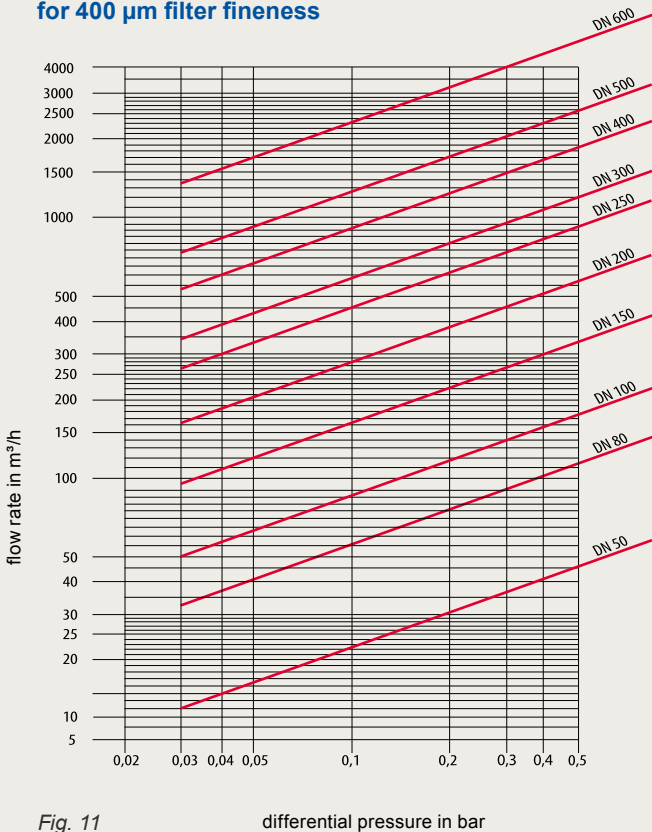


Fig. 11

Process Diagram

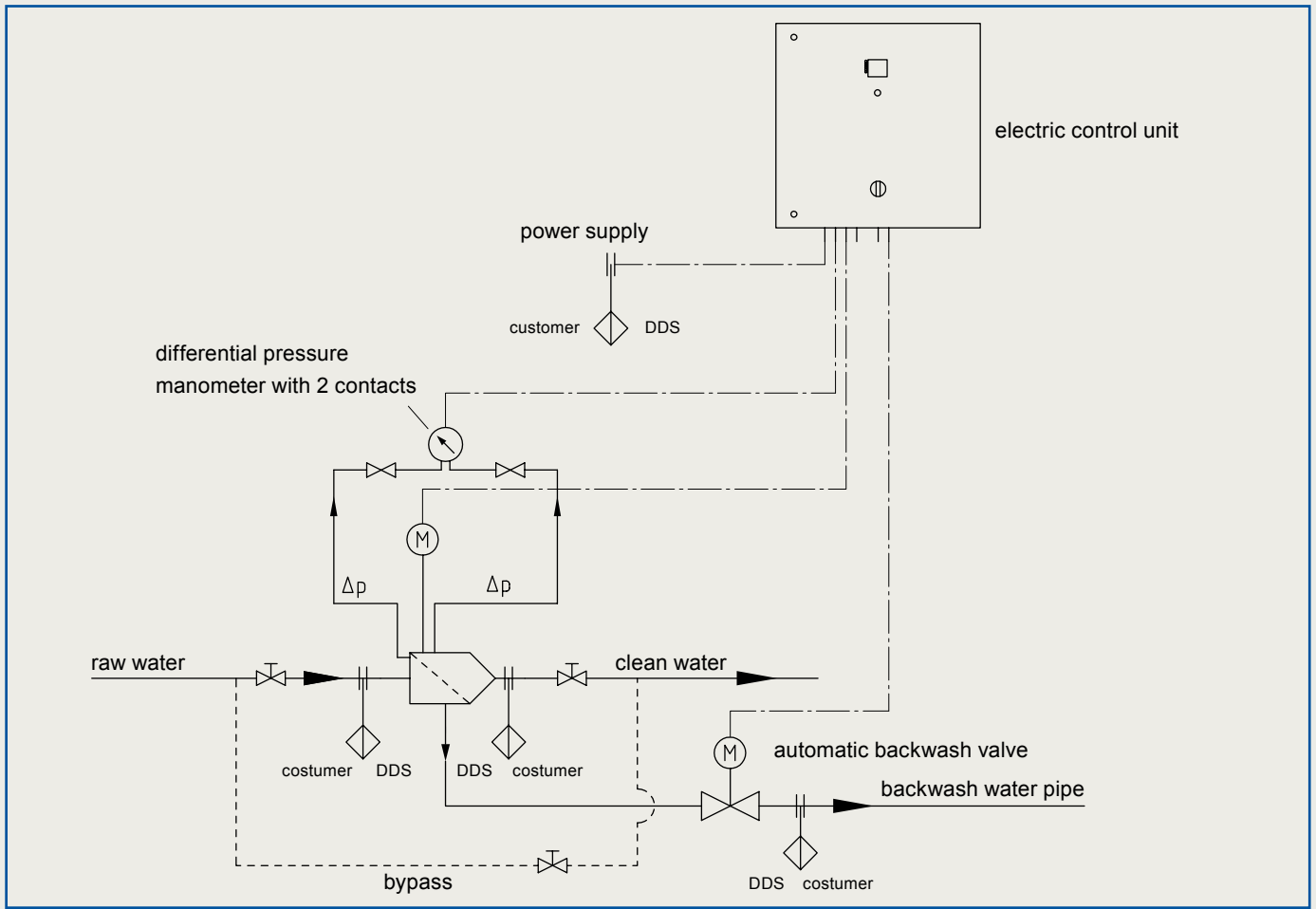


Fig. 12

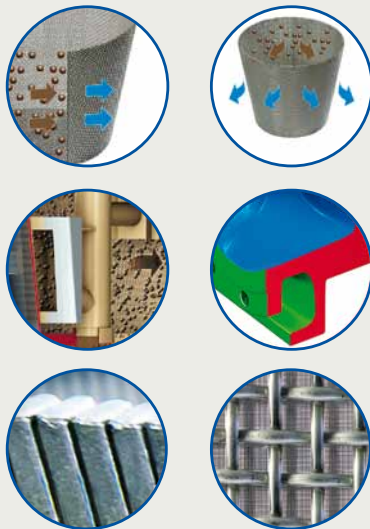


Fig. 13

Advantages

- high backwash speed (4 - 10 m/s)
- 100 % cleaning of the whole filter surface
- small water loss for backwashing
- robust construction
- crushing of coarse particles
- fine filtration $\geq 5 \mu\text{m}$ possible
- insert of slotted sieve or wire-cloth screen
- tested unit with ready-made cabling



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