



**DANGO & DIENENTHAL**  
Filtertechnik GmbH

## Plate Filter



# The Plate 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	5 m <sup>3</sup> /h to 2,500 m <sup>3</sup> /h
filter fineness	≥ 500 µm
operating pressure	0.3 to 25 bar
pressure loss with clean filter	0.1 to 0.3 bar
flange	DN 80 to DN 500
temperature	0 to + 110 °C
automatic / manual backwash	✓

## Scope of Supply



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	•
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	•
<i>included in the scope of delivery</i>	•
<i>available at extra charge</i>	Δ

	standard design	sea water resistant design	special design
filter housing	grey-cast iron	GRP	steel, stainless steel
filter element	stainless steel	stainless steel	stainless steel



## Filtration Process

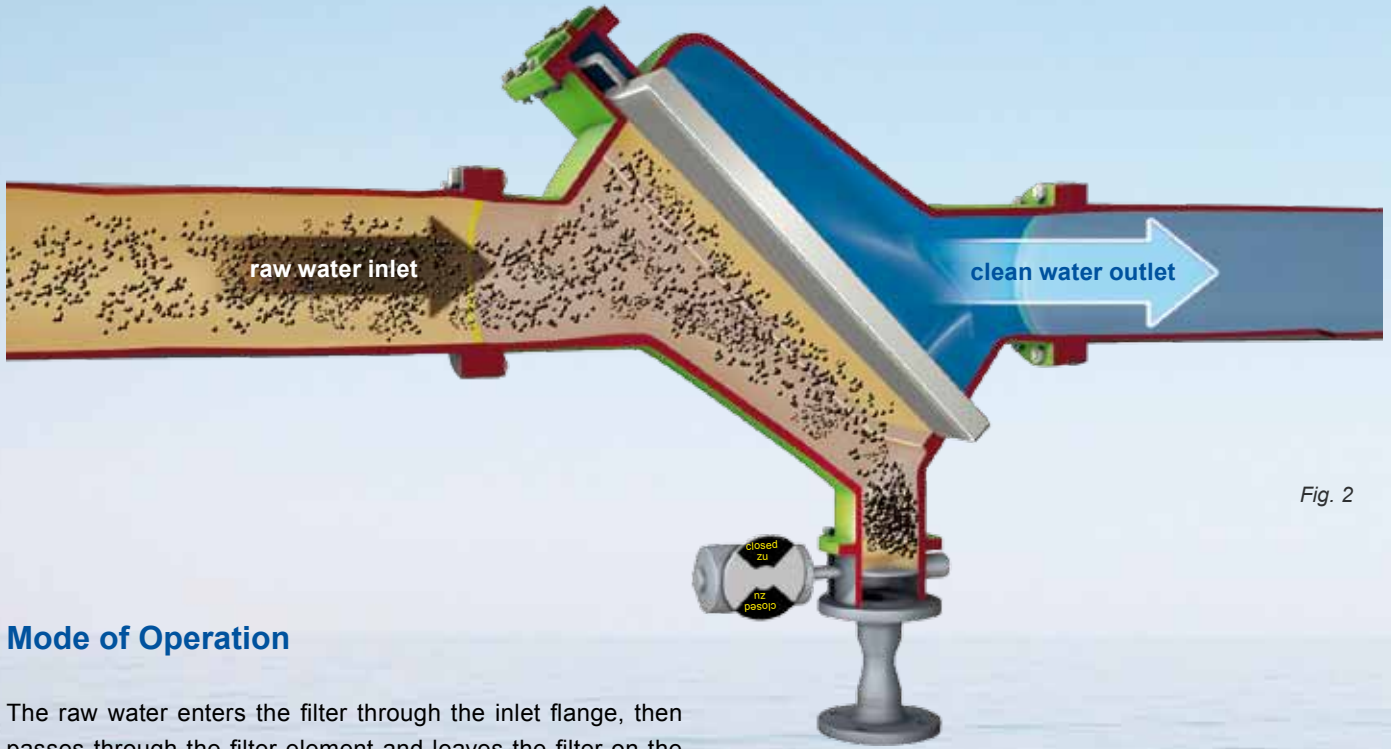


Fig. 2

## Mode of Operation

The raw water enters the filter through the inlet flange, then passes through the filter element and leaves the filter on the clean water side. Dirt particles coarser than the chosen filter fineness are retained. Due to the water velocity in the filter housing and the tilted filter element the dirt particles are carried to the dirt collecting area in the lowest part of the housing.

## Backwash Process

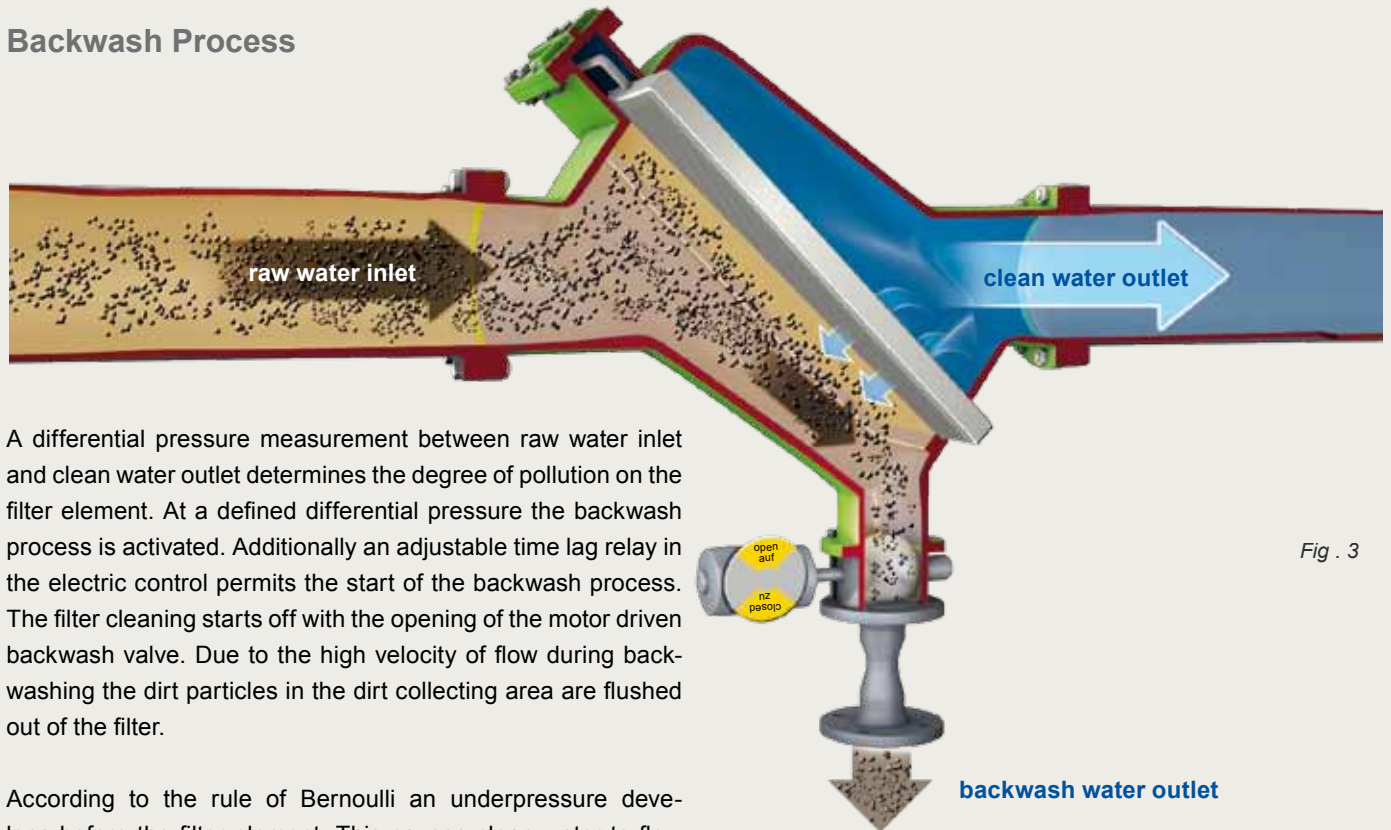


Fig. 3

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. 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. Due to the high velocity of flow during backwashing the dirt particles in the dirt collecting area are flushed out of the filter.

According to the rule of Bernoulli an underpressure develops before the filter element. This causes clean water to flow through the filter element opposite to the filtration direction. Thus dirt particles are flushed from of the filter element through the backwash water outlet.

After 10 - 20 seconds the backwash process is finished and the backwash valve closes automatically.

During backwashing the filtration process is not interrupted.

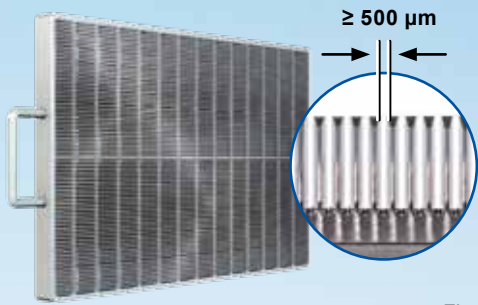


Fig. 4



Fig. 6

### Electric Control

The backwash process is started off depending on time and / or differential pressure thus ensuring 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



Fig. 5

### Filter Element

The filter element is built up of a reinforced slotted sieve construction for resisting even high differential pressures. For inspections the filter element can easily be removed from the filter housing by a grip.

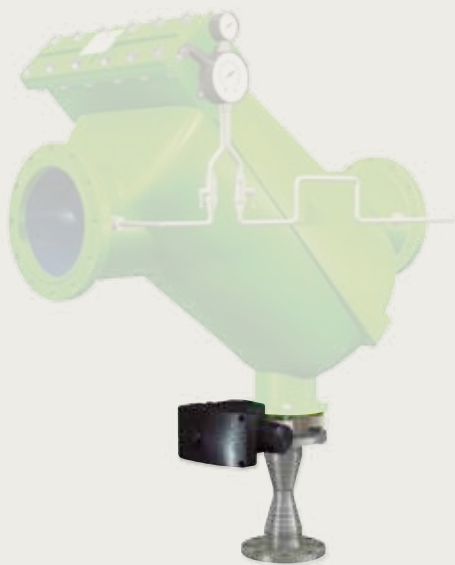


Fig. 7

### 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.

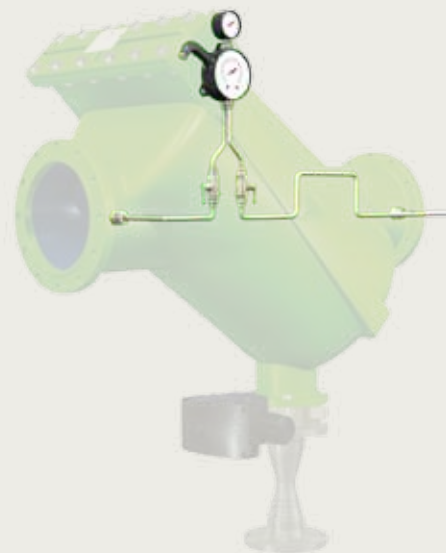


Fig. 8

### 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. 09 sea water cooling water filtration in a refinery



Fig. 10 oil filtration in a refinery

## Filter Data

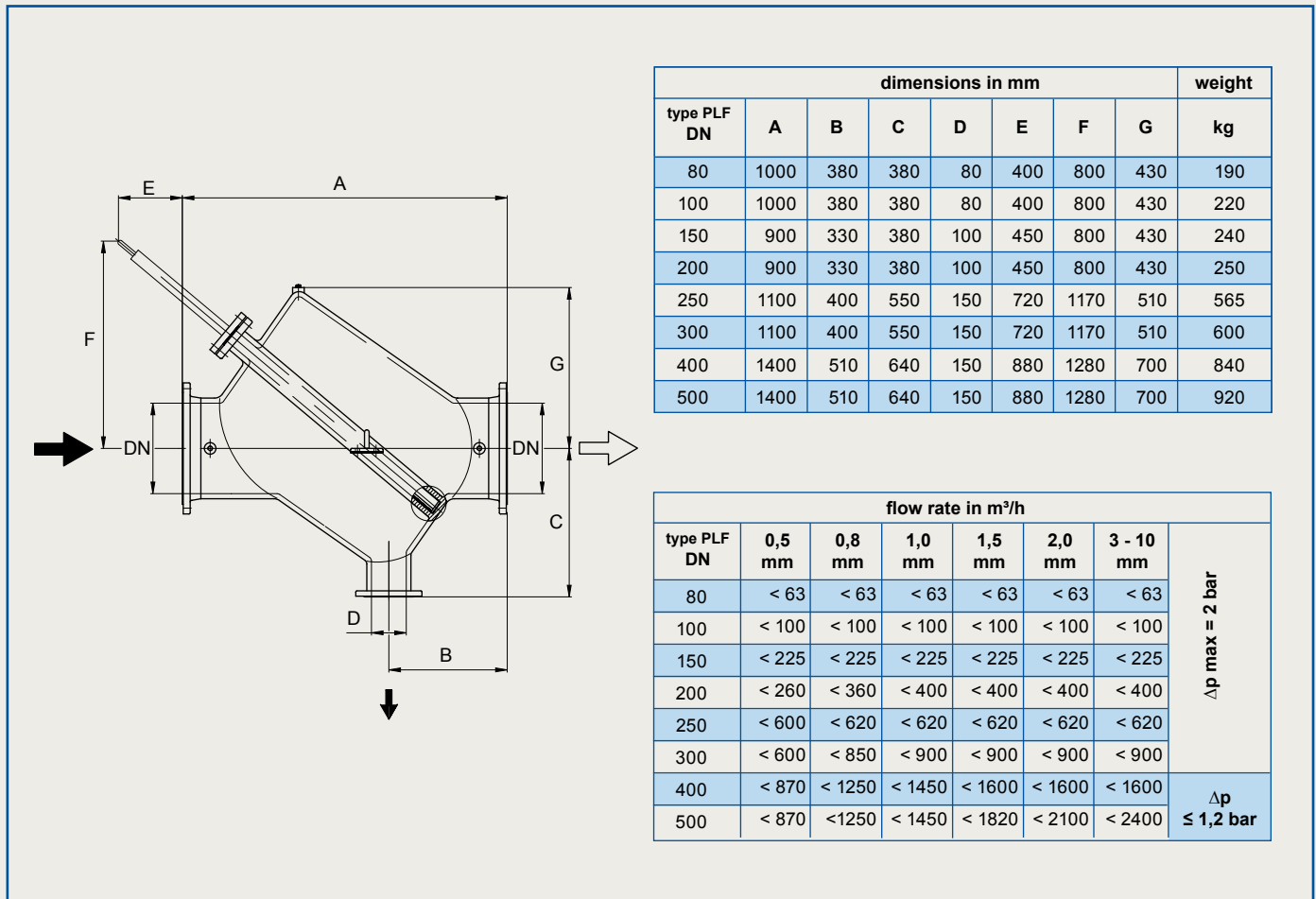


Fig. 11

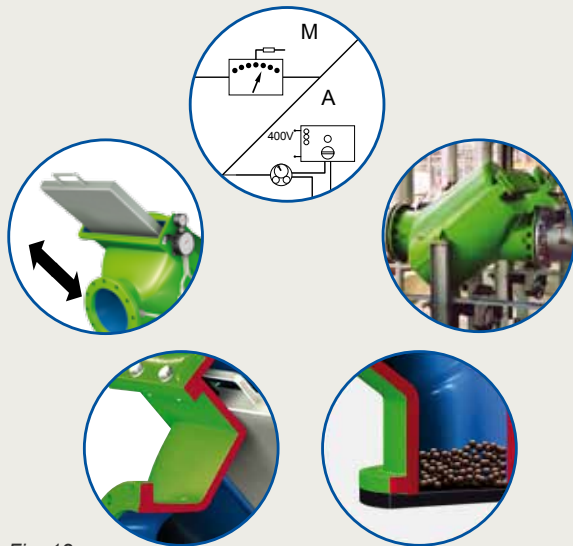


Fig. 12

## Advantages

- reservoir for separated dirt particles
- fast demounting of the filter element
- simple installation (inline construction)
- low wear (no movable parts in the filter)
- installation on the suction side of the pump possible
- wide range of materials
- ready-made cabling
- special design possible on customer's request
- manual or automatic cleaning possible



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