

**HYDAC** INTERNATIONAL

**Automatic  
Back-Flushing Filter  
for Process Technology  
AutoFilt® RF3.**



# HYDAC AutoFilt® RF3: So automatic,

## The Challenge

Particle contamination in process water and other operating fluids accelerates the rate of wear of system components, pipelines and valves. The particles suspended in these media also have a detrimental effect on the quality of the end products.

In order to protect the operational infrastructure and to guarantee shorter maintenance times, it is **essential** to have a filtration system to remove solid particles from operating fluids.

Using reliable filtration systems reduces the operating and maintenance costs.

Filtration measures also increase operational reliability.

As a basic principle, the filtration of operating fluids is becoming increasingly important in all branches of industry in order to guarantee high quality end products.

## The Solution

In process technology, the automatic back-flushing filter, AutoFilt® RF3 series, has been highly successful. Its flow-optimized design is impressive. It has the further advantage of conical, slotted tube filter elements in stainless steel which provide consistent flow characteristics, optimum filtration and unbeatable "ideal" filtration and back-flushing characteristics.

Thanks to automatic back-flushing, the filter is cleaned independently without interrupting the ongoing filter operation.

The HYDAC AutoFilt® RF3 is therefore very low-maintenance. Its robust design, specially developed for retrofitting, makes installation in both existing and new systems fast and cost-effective. Numerous operators of power stations, district heating, sewage treatment plants and manufacturing plants have relied on this dependable filter for many years.





# you might forget it's there.



## Applications

- Removal of solid particles from low-viscosity fluids
- Can be used in almost all sectors of industry

## Ready-to-operate unit

- All components (control, differential pressure gauge, back-flushing valve, gear motor) are already installed on the filter, ready to use
- Once the pipework has been connected, all that is required is for the auxiliary power supply to be applied

## Fully automatic operation

- Highly reliable
- User intervention not required
- Low operating costs
- Individually adjustable control parameters

## Isokinetic filtration and back-flushing

- Maximum utilization of the filter area
- Full filtration performance after back-flushing
- Complete cleaning of the conical filter elements

## Variable housing configuration

- Reduced costs due to simple and space-saving installation
- Simple to install

## Easy to service

- Low maintenance requirement
- Low operating costs

## Industries and Applications

The diverse range of applications makes the HYDAC AutoFilt® RF3 ideal for use in numerous sectors of industry:

### Power industry



- Conditioning of industrial water used to cool generators
- Filtration of sealing water to increase the service life of the turbine shaft floating ring seals in hydroelectric power stations

### Steel industry



- Filtration of process water to protect nozzles and pumps in high pressure descaling
- Water conditioning for cooling blast furnaces and rolling mills
- Emulsion filtration in hot and cold rolling mills
- Filtration of rolling emulsions

### Paper industry



- Protection of all types of nozzles on paper machines
- Treatment of fresh water (e.g. river water) to be used for cooling

### Automotive industry



- Filtration of coolant lubricants
- Filtration of washing fluids
- Protection of machine tools

### Marine



- Pre-filtration for ballast water conditioning systems

### Chemical industry



- Cooling water filtration
- Waste water filtration
- Filtration of chemicals

### Oil and gas industry



- Filtration of injection water
- Filtration of cooling water
- Filtration of service water
- Filtration of flushing water (pipeline flushing)
- Filtration solution for the subsea sector

### Water / waste water conditioning



- Protective filter before membrane systems
- Conditioning of service water in sewage treatment plants

### Mining



- Filtration of water for shield spraying
- Filtration of water for coal-cutting machinery
- Treatment of cooling water for mine ventilation

# Performance enhanced by Isokinetics.

## Isokinetic filtration and back-flushing

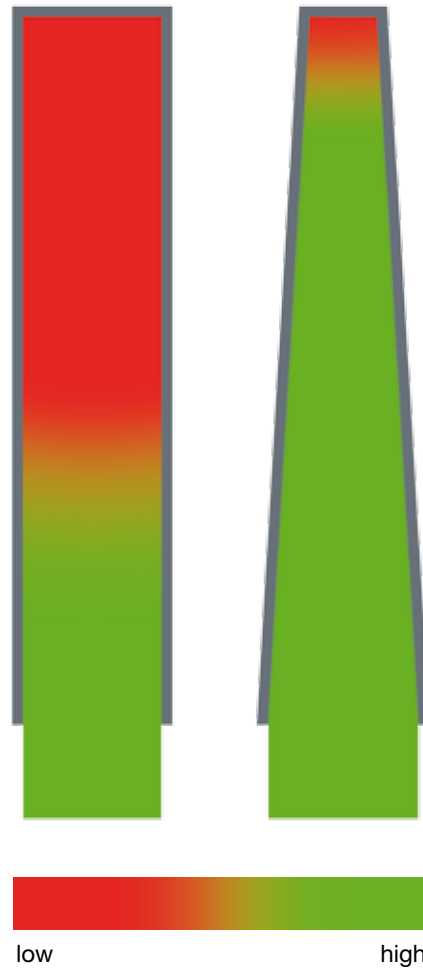
The special conical shape and configuration of the filter elements allow consistent flow, resulting in a low pressure drop and complete cleaning of the elements.

### Advantages:

- Fewer back-flushing cycles
- Lower back-flushing losses

## Efficiency of back-flushing

Filter elements: Cylindrical vs. Conical



## Choice of filter materials

### SuperMesh wire mesh



Material: stainless steel

Filtration rating:  $25\ \mu\text{m} - \leq 60\ \mu\text{m}$

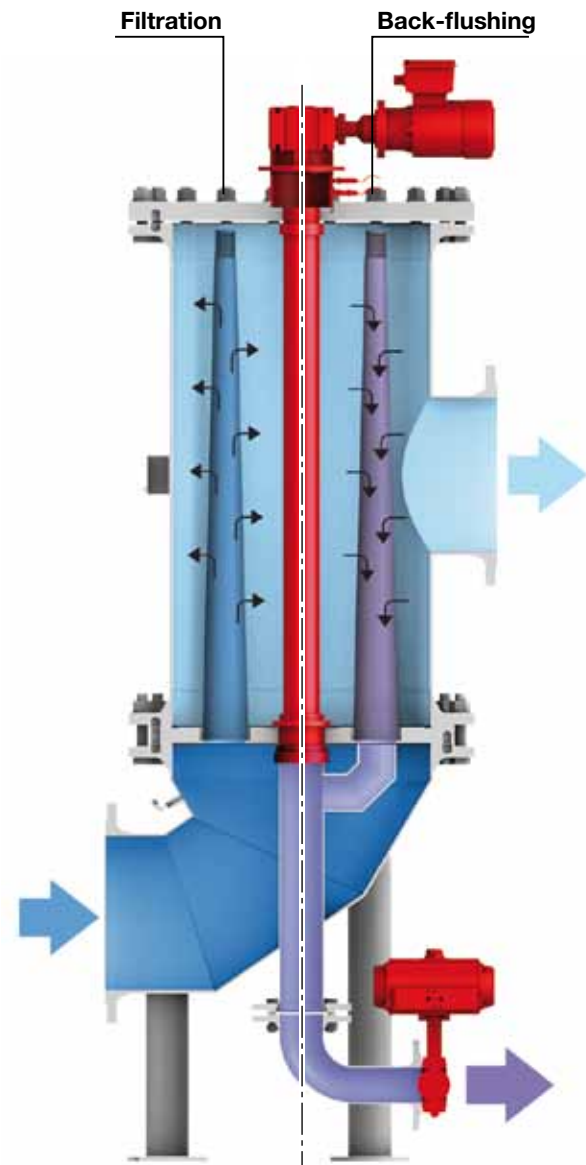
### Slotted tube



Material: stainless steel

Filtration rating:  $50\ \mu\text{m} - 3\ \text{mm}$

## Function model





# Automatically efficient.

## Filtration

The fluid to be filtered flows through the filter elements of the back-flushing filter, passing from the inside to the outside. Contamination particles then collect on the inside of the filter elements. As the level of contamination increases, the differential pressure between the contaminated and clean sides of the filter increases.

When the differential pressure reaches the pre-set trigger point, back-flushing starts automatically.

## Triggering back-flushing

Automatic back-flushing is triggered:

- When the differential pressure trigger point is exceeded,
- By means of an adjustable timer
- By pressing the TEST button.

## Back-flushing

- The gear motor rotates the flushing arm under the filter elements and ensures the contamination is discharged
- The contamination is flushed away through the open back-flushing valve

The pressure drop between filtrate side and back-flushing line flushes a small amount of the filtrate back through the contaminated filter elements. The contamination particles collected on the inside of the filter elements are loosened and flushed into the backflushing line via the flushing arm. After the "back-flushing time per element" has expired, or after one revolution (EU version), the back-flushing valve is closed. In this way, all the filter elements are back-flushed, one after the other. A back-flushing cycle is terminated once all filter elements have been cleaned.

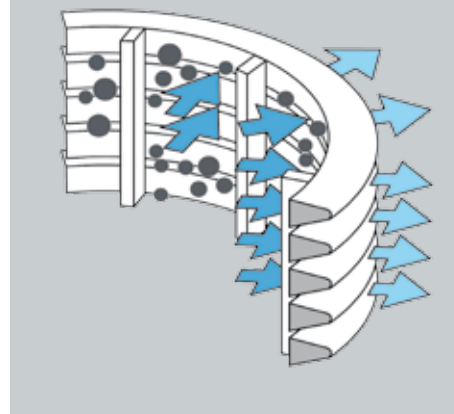
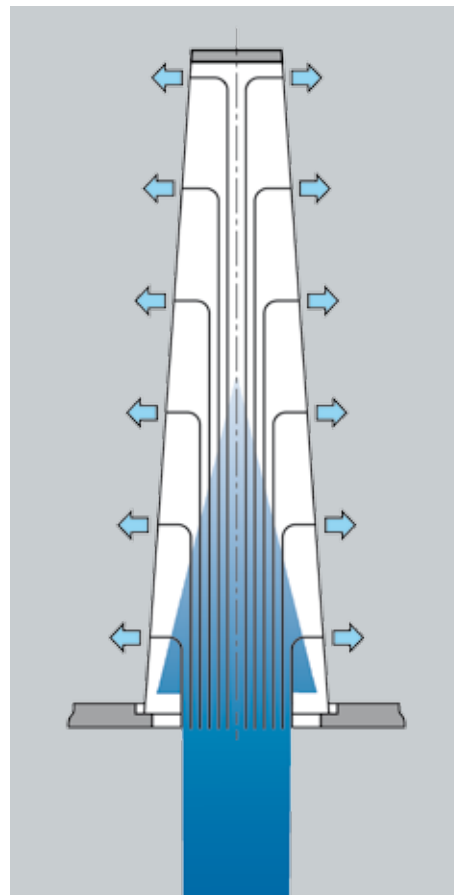
## Pulse-aided back-flushing

On the control types EPT and PT, the flushing arm remains under the filter element for only a few seconds.

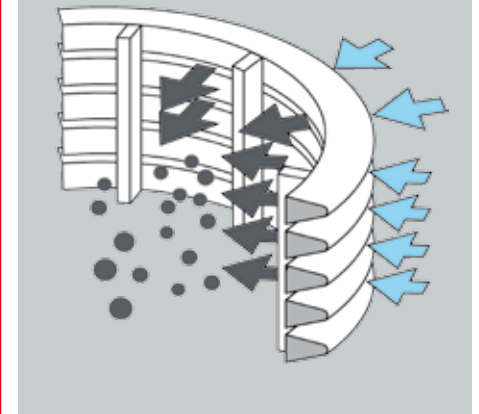
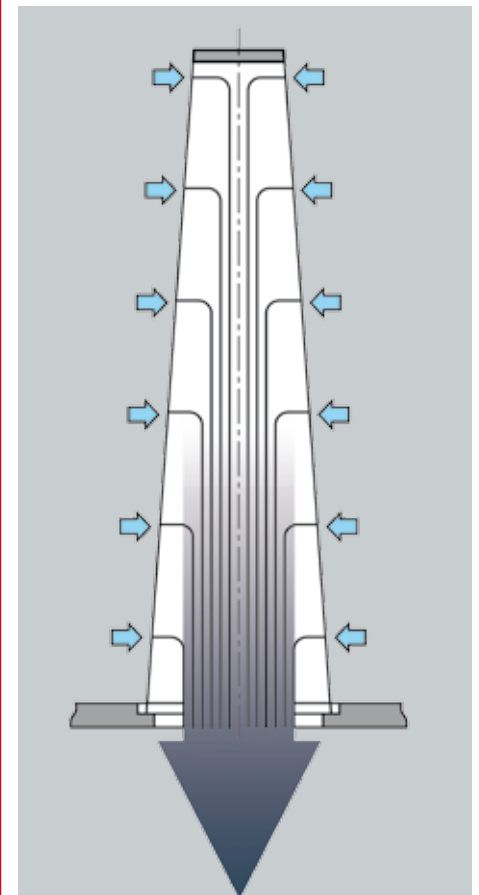
Rapid opening of the pneumatic back-flushing valve generates a pressure surge in the filter element openings, and supplements the cleaning effect of the back-flushing process.

The back-flushing valve opens and closes during back-flushing of each filter element (back-flushing volumes are lower in pulse-aided control).

## Filtration

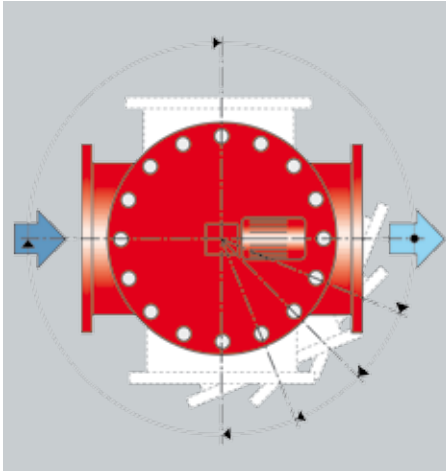


## Back-flushing



# Safety assured by proven Technology. And best Practice.

## Simple to install

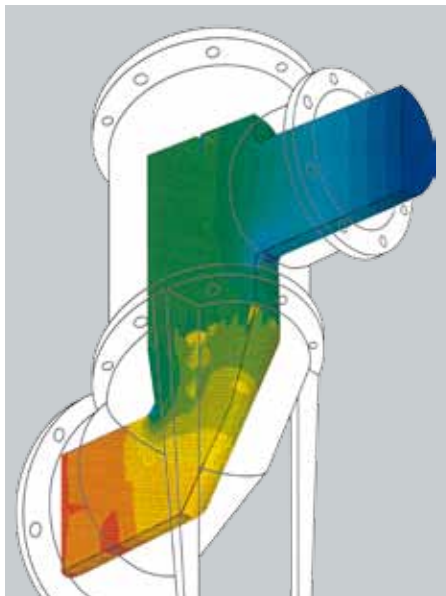


### Variable filter isometry:

The inlet and outlet flanges as well as the back-flushing line can be configured in different positions. This means that the filter can be integrated easily into any system layout.

## Flow optimized filter design

The filter was developed using the latest computer-aided flow simulation.



The particularly good flow characteristics allow the filter to be compact whilst achieving high filtration performance with low pressure drop.

## Individual control parameters



The differential pressure trigger point and back-flushing time per element can be adjusted to best suit the process conditions.

**Timer relays** can be used to trigger additional cleaning intervals, independently of the differential pressure. The control sequence is visualized by light-emitting diodes.

A second microswitch on the pressure gauge can be used for external signal monitoring.

## Operating safety

- Static seal between contaminated and clean side
- Tried-and-tested components
- Robust construction

## Technical specifications at a glance \*

- Maximum operating pressure**  
6, 10 or 16 bar (size-dependent)
- Operating temperature**  
90 °C
- Filtration ratings**  
25 µm to 3 mm
- Power supply**  
Electropneumatic, electric or pneumatic
- Material of filter housing**  
Carbon steel or stainless steel
- Material of filter elements**  
Stainless steel
- Material of internal parts**  
Stainless steel
- Corrosion protection for carbon steel filter housing**  
Polyurethane coating or rubber coating
- Connection sizes**  
DN 50 to DN 1000

\* The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

## System solutions



# Numerous Advantages due to Special Features.

## Performance

High processing performance	➔	Flow rate up to 10,000 m³/h
High throughput with compact dimensions	➔	Flow-optimized filter
Maximum utilization of the filter area	➔	Isokinetic filtration and back-flushing
Full filtration performance after back-flushing	➔	
No interruption to operation	➔	Continuous flow of filtrate even during back-flushing
Consistently high quality	➔	Certified to ISO 9001
Unbeatable $\Delta p$ curve	➔	Conical filter elements
Optimum element geometry provides consistent flow without reverse flow through the filter element	➔	
Global Presence	➔	Worldwide Service
Long service life	➔	Components tried and tested in thousands of applications
Customized adaptation to the particular application	➔	Numerous equipment options
	➔	Individually adjustable control parameters
Additional dynamic element cleaning with low loss of flushing fluid	➔	Pulse-aided back-flushing

## Costs

Excellent price-performance ratio	➔	Extensive standard equipment for real-world applications
Highly reliable	➔	Fully automatic operation
User intervention not required	➔	
Low operating costs	➔	
Reduced costs due to simple and space-saving installation	➔	Variable housing isometry
Simple installation and commissioning	➔	Ready-to-operate unit
Safety guaranteed by HYDAC function test	➔	

## Maintenance

Low maintenance costs	➔	Easy to service
Guaranteed high quality filtrate	➔	Static seal between contaminated and clean side
Low maintenance	➔	





Accumulators E 30.000



Filter Technology E 70.000



Process Technology E 77.000



Filter Systems E 79.000



Compact Hydraulics E 53.000



Accessories E 61.000

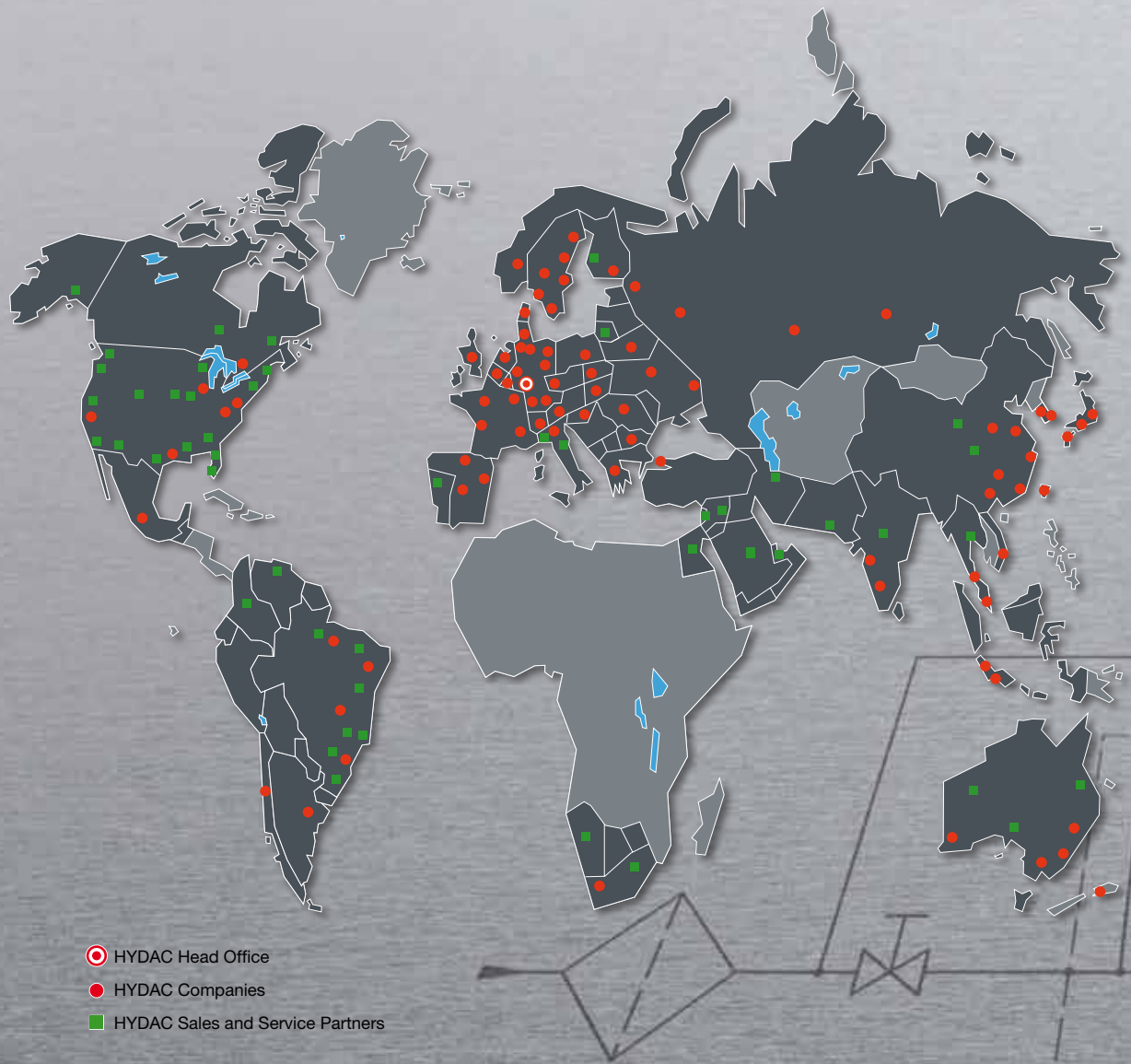


Electronics E 180.000



Cooling Systems DEF 5.700

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