

HYDAC

INTERNATIONAL

Innovative Solutions



AutoFilt® RF3

Automatic Self-Cleaning Filter



AutoFilt® RF3 Automatic Self-Cleaning Filters up to 150 PSI* • up to 31,000 GPM

Description:

The AutoFilt® RF3 is an automatic self-cleaning filtration system designed for continuous maintenance-free filtration for all major manufacturing and processing industries. It removes solid contamination from low viscosity fluids such as water and machine tool coolants. Its rugged construction and self-cleaning feature provide companies with increased machinery reliability, resulting in reduced operating, labor and maintenance costs.

Superior removal of contamination particles from water is accomplished with slotted tube (*wedge wire*) filter elements ranging from 50 to 3,000 microns or SuperMesh™ filter elements (*either 25 or 40 microns*).

The automatic self-cleaning process begins when the field-adjustable ΔP is reached across the elements.

Due to the unique single element cleaning process, the total filtered flow is not reduced during the cleaning process.

Flow rates range can range from 20-31,000 gpm and housings are available with ANSI mounting port flanges from 2" to 36".

HYDAC can supply numerous combinations of housing materials, as well as system operating equipment to reach the optimum installation for every industry application.

Cost Effectiveness

Particle contamination in water accelerates the rate of wear on system components such as spray nozzles, water valves, and pipelines. This could result in premature component failure.

The use of automatic self-cleaning filters lead to a significant decrease in service and maintenance intervals resulting in time and labor savings. As well, costs for replacement equipment and waste disposal can be minimized.

Process water is typically contaminated with solids, and water companies apply surcharges to handle the contaminant discharge. The HYDAC AutoFilt® RF3 is ideally suited for removing these contaminants prior to discharge, thus reducing or eliminating any financial surcharge.



Technical Details

Flow Rates	20 - 31,000 gpm
ANSI Flange Sizes	2" - 36"
Filtration Micron Ratings	25 - 3000 μm
Max. Operating Pressure	90 - 150 psi*
Power Source	Electric, Pneumatic or Electro-pneumatic
Power Requirements	480 3-phase VAC 80 psi air pressure
Filter Housing Material	Carbon Steel Stainless Steel 316Ti
Corrosion Protection for Carbon Steel Vessel	Polyurethane Rubber coating
Internal Parts	Stainless Steel 304
Self-Cleaning Valve	Stainless Steel akin 316
Filter Elements	Stainless Steel 316L
Filter Vessel Certification	ASME Code available

Special coatings and Steels are available for severe fluid applications

*Other Models Available, Consult Factory

Model Code

	RF3	5	EPT	NG	N	1	3	0	/	KS1000	5	12345678
Filter Type _____												
RF3 = AutoFilt®												
Filter Size _____												
	Typical Flow Range for Water Service (gpm)*						ANSI Flange					
C = 20 - 120							2"					
0 = 110 - 500							4"					
1 = 400 - 1120							6"					
2 = 880 - 1980							8"					
2.5 = 1760 - 2600							10"					
3 = 2420 - 3780							12"					
4 = 3550 - 7480							16"					
5 = 6600 - 10,780							20"					
6 = 8800 - 15,850							24"					
7 = 13,200 - 22,000							28"					
8 = 19,800 - 31,000							36"					
Drive Control / Connecting Voltage _____												
EPT8 = Electric (460/3/60) / Pneumatic cycle control												
EU8 = Electric control (460/3/60)												
PT = Pneumatic cycle control, ΔP dependent, size C-4												
PTZ = Pneumatic cycle timed control, size C-4												
Housing Material / Corrosion Protection _____												
N = Carbon steel (1.0038), outside primed												
NM = Carbon steel (1.0038), outside primed, inside Metallogal® painted (polyurethane)												
NG = Carbon steel (1.0038), outside primed, inside rubber coated (butyl coated)												
E = 316 Ti Stainless steel (1.4571)												
A = with ANSI-flanged, additional A at the end												
Shut-Off Valve Material _____												
N = Butterfly valve, polyurethane coated carbon steel body with 316 stainless steel disc & stem												
Differential Pressure Gauge _____												
1 = Pressure chamber, Aluminum 3.258302												
2 = Pressure chamber, Stainless steel 1.4305												
3 = with pressure mediators stainless steel 315 TI												
Flange Position Inlet & Outlet _____												
1 = outlet opposite inlet (standard)												
2 = outlet turned 90° clockwise direction compared to standard												
3 = outlet turned 180° clockwise direction compared to standard												
4 = outlet turned 270° clockwise direction compared to standard												
Modification Number _____												
Element Set _____												
KD25 = Conical SuperMesh™												
KD40 = Conical SuperMesh™												
KS50 = Conical slotted tubes (wedge wire)												
KS100 = Conical slotted tubes (wedge wire)												
KS150 = Conical slotted tubes (wedge wire)												
KS200 = Conical slotted tubes (wedge wire)												
KS300 = Conical slotted tubes (wedge wire)												
KS400 = Conical slotted tubes (wedge wire)												
KS500 = Conical slotted tubes (wedge wire)												
KS1000 = Conical slotted tubes (wedge wire)												
KS1500 = Conical slotted tubes (wedge wire)												
KS2000 = Conical slotted tubes (wedge wire)												
KS2500 = Conical slotted tubes (wedge wire)												
KS3000 = Conical slotted tubes (wedge wire)												
Size of Element Set _____												
Use same code selected in filter size												
Drawing Number _____												
(omit) = standard version												
For special versions a number will be provided after technical clarification at head office												

*Consult factory for filter sizing

Operation

The design of the AutoFilt® RF3 Self-Cleaning Filter is simple yet highly effective. The basic construction consists of the main housing, inlet and outlet ports with flanged connections, filter elements, outlet valve and actuator and electronic operating controls. All of these combined together provide a completely automated self-cleaning filtration system.

The process begins with fluid passing through the inlet flange, reaching the filter elements by flowing from inside the element to outside. Solid contamination is then trapped on the inside of the wedge wire filter element. As contamination increases, the differential pressure between the contaminated and clean side increases. When the set differential pressure is reached (typically 7 psid) the self-cleaning process is triggered.

Note: This self-cleaning activation has an adjustable differential pressure or time setting. (see *Starting the Automatic Self-Cleaning Process* on page 5.)

The self-cleaning process is one complete cycle which cleans one element at a time in succession. The geared motor turns the contamination discharge arm under the filter element to be cleaned. The contamination discharge valve is then opened by an actuator. This results in a high pressure drop within the filter element being cleaned, which forces the particles into the discharge line. During this operation, only a small amount of clean fluid is used to complete the cleaning process.

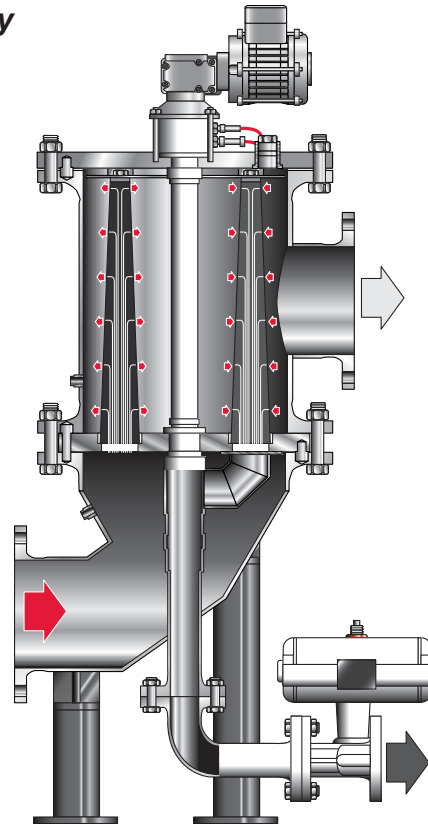
A typical self-cleaning cycle takes less than 60 seconds.

The cleaning cycle takes place with no interruption in flow or pressure drop.

The unique conical element design and internal mounting configuration allow for smooth flow transition, resulting in minimal pressure loss during the cleaning process.

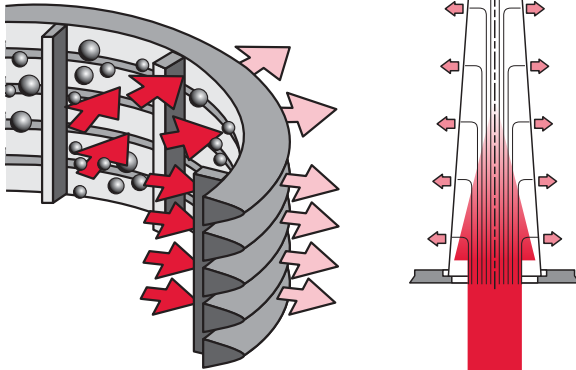
Advantage to the customer: Fewer self-cleaning cycles and a minimum loss of flushing fluid.

Cutaway



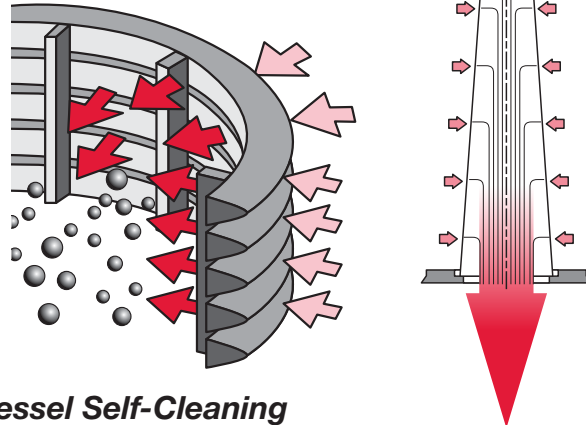
Element Filtering

Inside to Outside



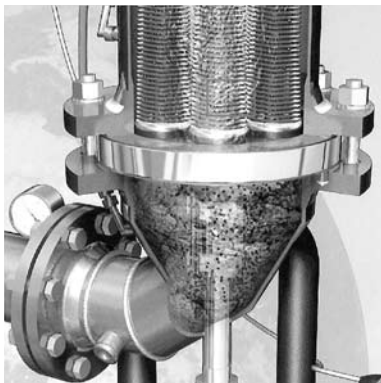
Element Back-Flushing

Outside to Inside



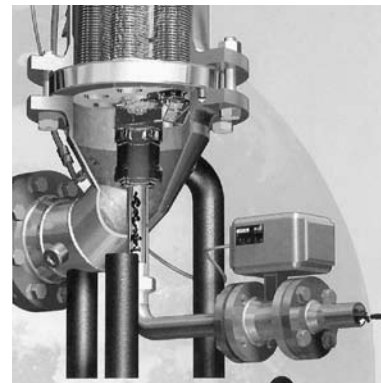
Vessel Filtration

Inside to Outside



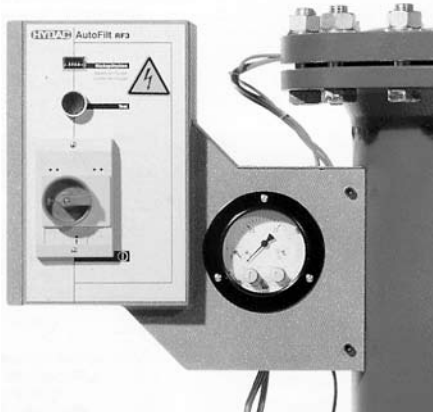
Vessel Self-Cleaning

Outside to Inside

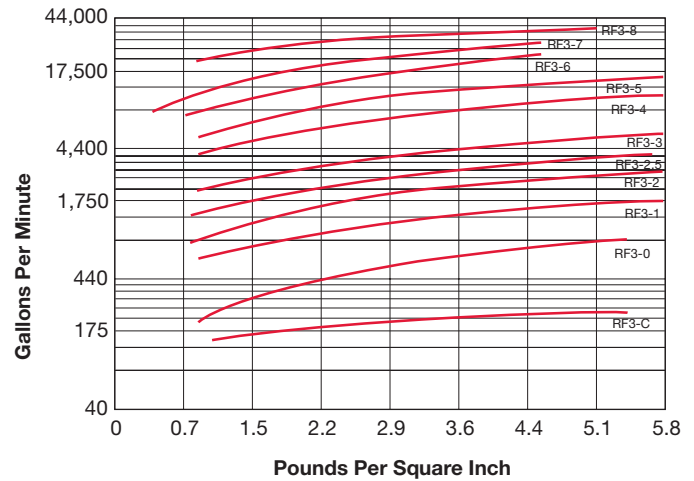


Ways to Start the Automatic Self-Cleaning Process

- Pressing the Test Button on the Control Panel
- Electrically activated Test Button
- Differential Pressure set point is exceeded, e.g., 7 psid
- Adjustable Timer, e.g., 12 hours
- Combination Differential Pressure and Adjustable Timer



Flow Curves



Note: The curves are for filter rating from 100 μm - 3000 μm . For 50 μm the pressure drop increases by 30%. This is true for sizes RF3 0 - 8. For RF3 C there is no increase in pressure drop. For 25, 40, and 50 μm the pressure drop increases by 30%.

PLC-Based Control

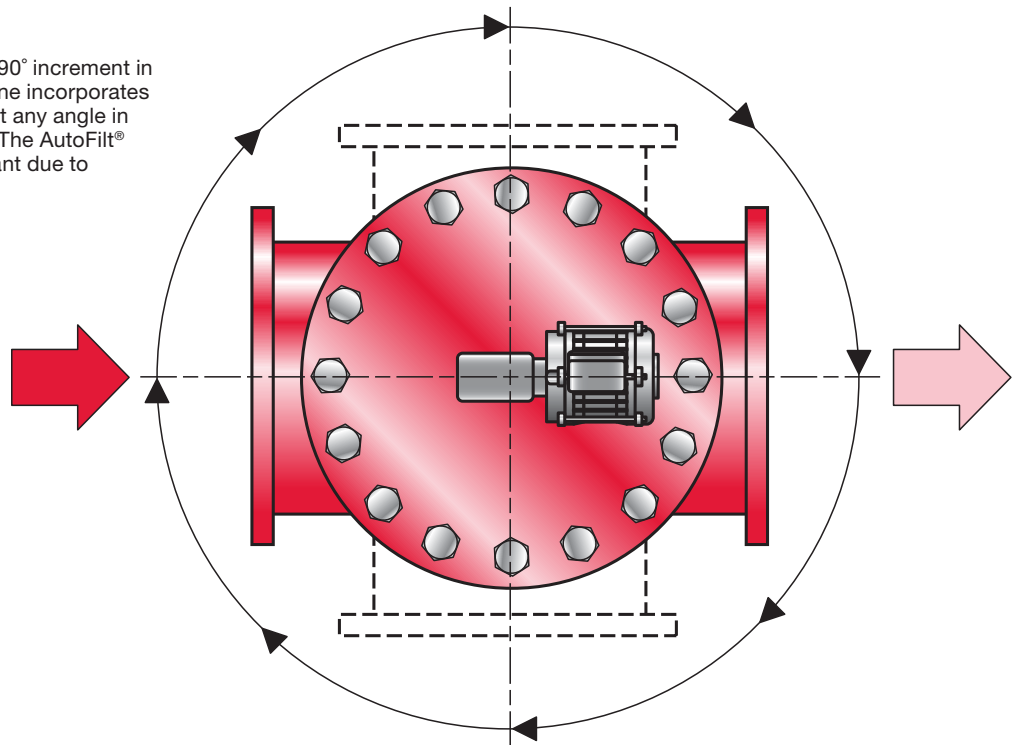
The EPT and EU control versions utilize a PLC for control of the backflush process. The PLC programming includes operational diagnostics to alert the operator if a fault in normal operation occurs.

Ready To Operate

The filter control unit and differential pressure measuring lines are already connected. Once the inlet, outlet, and discharge lines have been attached, only the power and/or air supply need to be connected.

Variable Filter Geometry

The outlet flange can be oriented in any 90° increment in comparison to the inlet. The discharge line incorporates a slip flange which enables positioning at any angle in which the housing legs do not interfere. The AutoFilt® RF3 can be easily integrated into any plant due to these flexible mounting options.



Filter Elements

Types and Micron Ratings

- Slotted tube (wedge-wire) 50 - 3000 µm
- SuperMesh™ 25 and 40 µm



Advantages of the AutoFilt® RF3	... the Benefits to You!
Extensive standard features for numerous applications	Excellent price to performance ratio
Automatic operation	Reliable and safe - Set it & Forget it Low operating costs Simple mechanical design
Continuous fluid flow during self-cleaning	No interruption of unit operation Minimum fluid loss
Flow rate up to 31,000 gpm	High process performance
Service friendly	Low maintenance & replacement part costs
Conical filter elements for isokinetic filtration and cleaning	Maximum utilization of filter surface area Full filtration performance after cleaning process Maximum element cleaning efficiency
Slotted-tube filter elements	Long service life - rugged construction Optimum filtration and cleaning properties
Pulse-aided cleaning	Additional dynamic element cleaning with low loss of cleaning fluid
Adjustable controls	Customer-specific for numerous applications
Flow-optimized filtration	High flow characteristics in compact dimensions Lowest possible pressure loss Uniform dirt loading of filter element
Static sealing between contaminated and clean sides	Guaranteed high filtration quality No contamination bypass
Variable housing isometry	Reduced costs due to space saving and simple installation
Numerous equipment options	Customer specific for numerous applications
Ready to operate unit	Simple installation and commissioning
ISO 9001 certification	High quality & performance standards

Applications

WATER PLANTS

AutoFilt® RF3 installed as a 1st stage filter for the removal of sand and debris from well or surface water sources. Extended life is provided to the cartridge elements protecting reverse osmosis systems.

PROCESS WATER

AutoFilt® RF3 is used to remove solid contamination from incoming river and lake process water. Protection is provided to critical plant operating components. As well, the AutoFilt® RF3 can be used to filter discharge water, thus reducing and/or eliminating excessive water company surcharges.

POWER PLANTS

AutoFilt® RF3 is used to remove scale from water protecting cooling generators. Filtration of the power plant sealing water will increase the service life of turbine shaft sliding-ring seals.

COOLING TOWERS

AutoFilt® RF3 is used to filter water used in cooling towers to prevent the clogging of the condensers.

AUTOMOTIVE INDUSTRY

AutoFilt® RF3 is used to filter coolants and for parts washing systems.

STEEL INDUSTRY

AutoFilt® RF3 is used to protect nozzles and pumps during the high pressure descaling process. In addition, protection is provided during the cooling process for blast furnaces and rolling mills.

PAPER INDUSTRY

AutoFilt® RF3 is used to protect nozzles from becoming clogged on paper machines and seal water for pumps and vacuum pumps.

MACHINE TOOLS

AutoFilt® RF3 is used to filter coolants used by machine tools.

STEAM SUPPLY

AutoFilt® RF3 is used to remove piping scale protecting the heat exchangers.

FOOD INDUSTRY

AutoFilt® RF3 is used to filter supplied municipal water used in food processing.

CHEMICAL PLANTS

AutoFilt® RF3 is used to filter process water used by chemical plants for cooling and production.





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