

# Automatic Back-Flushing Filter AutoFilt<sup>®</sup> RF4W for water applications



## 1. GENERAL

#### **Product description**

- Self-cleaning automatic filter
- Separation of solid particles from low viscosity fluids

#### Conical filter element technology

- Wedge wire (50 μm 1000 μm)
- SuperMesh wire mesh, 3-layer, sintered (25 μm, 40 μm, 60 μm)
- Optional SuperFlush non-stick technology

#### **Product advantages**

- Ready-to-operate unit
- Compact design with innovative sealing concept and quick-opening
- Fully automatic operation
- No interruption of filtration during back-flushing
- Full filtration performance following back-flushing
- Maximum utilisation of the filter area
- Low operating costs
- Low maintenance costs

Technical specifications of standard models								
Installation size <sup>1)</sup>	Pressure level [bar]	Connection inlet/outlet	Connection, back- flush line	Weight [kg]	Volume []]	No. of filter elements	Filter area [cm²]	Back-flush volume [[] <sup>3)</sup>
3	10 / 16	G 2"	G ¾"	40 <sup>2)</sup>	9	4	1430	13
						5	1785	16.5
						6	2140	20
						7	2500	23.5

#### Legend

<sup>1)</sup> T<sub>s max</sub> for all AutoFilt<sup>®</sup> RF4W: 80 °C

<sup>2)</sup> Refers to EU version

<sup>3)</sup> Back-flush volume with a valve opening time of 1.5 seconds with a pressure difference of 1.5 bar between the filtrate line and the back-flush line

## 2. FUNCTION

#### FILTRATION

- The fluid to be filtered flows through the filter elements of the back-flushing filter, passing from the inside to the outside
- During this process, the particles deposit on the smooth inside of the filter element surface
- As the level of contamination increases, the differential pressure between the dirty and the clean side of the filter increases
- When the pressure drop reaches the pre-set trigger point, back-flushing starts automatically

#### **TRIGGERING BACK-FLUSHING**

- Automatic: Back-flushing is triggered automatically when the triggering differential pressure is exceeded
- Timer function: Makes it possible to set a maximum filtration time, independent of differential pressure, between the two back-flushing cycles
- By pressing the "TEST" button

#### BACK-FLUSHING OF THE FILTER ELEMENTS – EPT ELECTRO-PNEUMATIC CONTROL

- The rotary drive rotates the filter element mounting plate, along with the filter elements, into position so that a clogged filter element is located above a flush opening
- The back-flushing valve is opened
- The pressure drop between filtrate side and back-flush line flushes a small amount of the filtrate back through the contaminated filter element
- The contaminant particles deposited on the inside of the filter elements are loosened and flushed into the back-flush line via the flush opening
- Once the "back-flush time per filter element" has elapsed, 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 complete once all the filter elements have been cleaned
- The flow of filtrate is not interrupted during back-flushing

#### BACK-FLUSHING OF THE FILTER ELEMENTS – EU ELECTRICAL CIRCULATION CONTROL

- The electrically operated back-flush valve opens
- The gear motor rotates the filter element mounting plate continuously as it passes underneath the filter elements to be cleaned
- The pressure drop between filtrate side and back-flush line flushes a small amount of the filtrate back through the contaminated filter elements
- The contaminant particles deposited on the inside of the filter elements are detached and carried away via the filter element mounting plate into the back-flush line
- Once a pre-set time has elapsed, the gear motor stops and the electric back-flushing valve closes automatically
- A back-flushing cycle is complete once all the filter elements have been cleaned
- The number of circulations can be preset via the control
- The flow of filtrate is not interrupted during back-flushing











Filtration

#### **Back-flushing**

## **3. SPECIAL FEATURES**

#### FILTER ELEMENT TECHNOLOGY

#### **Conical filter elements**

Robust wedge wire or SuperMesh filter elements made from stainless steel are used in the HYDAC AutoFilt® RF4W automatic back-flushing filter. The conical shape of the filter elements provides maximum efficiency during filtration and optimum effectiveness during back-flushing.

#### SuperFlush non-stick coating

For waste-water treatment applications, the filter elements can also be given a special non-stick coating (SuperFlush).

#### Advantages of the SuperFlush coating:

- Unique coating technology
- Available for conical filter elements
- Prevents particle build-up on the filter element surface
- Gel-like particles do not adhere to the filter element surface
- Reduces biofouling
- Increases the service life
- Increases efficiency

#### **ISOKINETIC FILTRATION AND BACK-FLUSHING**

The conical shape and alignment of the filter elements allow uniform flow, resulting in a low pressure drop and effective cleaning of the filter elements.

#### Advantages:

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

#### PULSE-AIDED BACK-FLUSHING

In the electro-pneumatic cyclic control type, the filter element to be back-flushed remains in the flushing position for only a few seconds. Rapid opening of the back-flushing valve generates a pressure surge in the filter element openings, providing an additional cleaning effect to the back-flushing process.

## SMALL BACK-FLUSH VOLUMES DUE TO CYCLIC CONTROL

In the EPT control type, the back-flushing valve opens and closes during back-flushing of each filter element.





Wedge wire

SuperMesh – Wire mesh, sintered, without support structure



With | Without SuperFlush Non-stick coating for filter elements



## 4. FILTER CALCULATION\*

## CHECKLIST, FILTER CALCULATION

#### Step 1: Checking the prerequisites

- The determining factor for operating the AutoFilt<sup>®</sup> RF4W is the presence of a pressure difference of at least 1.5 bar\* between the filter outlet and the back-flush line
- This minimum pressure difference is vital for the filter operation
- Application data is determined using filter questionnaires
- The flow velocity of 4 m/s at the filter inlet should not be exceeded
- The maximum permitted operating temperature for all AutoFilt<sup>®</sup> RF4W is 80 °C
- The minimum flow rate must not drop below 40 l/min

#### Step 2: Filter sizing

- The initial pressure difference  $(\Delta p)$  when the filter is in a clean condition must not exceed 0.2 bar
- The pressure drop curve applies to filtration ratings of 50 μm to 1000 μm wedge wire and to 25 μm / 40 μm and 60 μm SuperMesh filter elements
- The flow velocity of 4 m/s at the filter inlet should not be exceeded

#### Step 3: Calculation tables

The calculation tables form an important decision-making basis for selection of the AutoFilt® RF4W.

In particular, the higher contamination load in the cooling lubricant emulsion applications requires that the filter be calculated more generously

### CALCULATION TABLES WATER APPLICATIONS

Fluid	Filter size / max. flow rate [l/min] RF4W size 3		
Water	450		

The flow rate ranges indicated apply to filtration ratings  $\geq$  100  $\mu m$ 



## **5. FILTER CONFIGURATION\***

	Standard	Optional
Housing manufacture	HYDAC Standard	
Port size	Inlet / outlet G 2"	
	• Back-flush line: G ¾"	
Housing materials	Stainless steel casting: 1.4581 or similar (group 316)	
Material of filter elements	Wedge wire	
	<ul> <li>Wire mesh - SuperMesh</li> </ul>	
	<ul> <li>Stainless steel group 316</li> </ul>	
Materials of internal parts	Stainless steel group 304	Stainless steel group 316
Sealing materials	FPM/FKM	Various sealing materials on request, depending on the particular fluid
Differential pressure monitoring	Pressure transmitter stainless steel V2A group	Pressure transmitter, duplex
Documentation	<ul> <li>Assembly and operating instructions</li> </ul>	Certificate of conformance CoC
	• E plan	Acceptance test certificate 3.1
	Declaration of incorporation	according to DIN EN 10204 for design, pressure and function testing
		<ul> <li>Acceptance test certificate 3.1 according to DIN EN 10204 for design, pressure and function testing, including material certificates according to EN 10204, 3.1 for the pressure-bearing modia centesting bearing parts</li> </ul>
		<ul> <li>Material certificates according to EN 10204, 3.1 for pressure-bearing media- contacting housing parts</li> </ul>
		<ul> <li>Russian device pass card incl. explanation letter for TRCU 032 / 2013; in addition to declaration of conformity for TRCU 010 / 2011</li> </ul>

\* Other versions and customer-specific special solutions after consultation with our Head Office.

## 6. MODEL CODE

MODEL CODE AutoFilt® RF4W
Filter type         RF4WL - left filter inlet - standard         RF4WR - right filter inlet         Filter size         3 = G2"         Pressure ranges         2 = 10 bar (only for EU)         3 = 16 bar (EPT & EU)         No. of filter elements         4 = 4 pieces         5 = 5 pieces         6 = 6 pieces - standard         7 = 7 pcs only in case of high dirt load         Mounting/venting (more than one option can be chosen)         0         0 = without - standard         1 = for wall mounting         2 = base frame         3 = air-bleed valve and piping         4 = automatic aeration/deaeration (plastic) and piping
Control type / Power supply voltage
Control type A = EPT: electro-pneumatic cyclic control B = EU: electrical circulation control – standard Supply voltage 
Housing material / coating
Inner parts         E1       = stainless steel 1.4301, 1.4541 or similar (group 304/321) – standard         E2       = stainless steel 1.4401, 1.4571 or similar (group 304/321) – standard         E2       = stainless steel 1.4401, 1.4404, 1.4571 or similar (group 316)         Back-flush valve
End documentation (multiple naming possible)         0       = standard (assembly & operating instructions, E plan, Declaration of Incorporation)         A       = certificate of conformance CoC + standard         B       = acceptance test certificate 3.1 according to DIN EN 10204 for design, pressure and function test + standard         C       = acceptance test certificate 3.1 according to DIN EN 10204 for design, pressure and functional testing, including material certificates according to EN 10204, 3.1 for the pressure-bearing media-contacting housing parts + standard         D       = material quality certificates according to EN 10204, 3.1 for the pressure-bearing media-contacting housing parts + standard         E       = Russian device pass card incl. explanation letter for TRCU 032/2013; in addition to declaration of conformity for TRCU 010/2011 + standard         Modification number       Modification number
The latest version is always supplied (currently 3)
Filter elements/filtration rating         S       = "S" additionally prefixed for SuperFlush         KNS       = wedge wire 50 µm to 1000 µm         KND       = SuperMesh 25 µm, 40 µm, 60 µm (3-layer)         Filtration ratings: KNS 50 µm, 100 µm, 150 µm, 200 µm, 250 µm, 300 µm, 500 µm, 1000 µm         Filtration ratings: KND 25 µm, 40 µm, 60 µm
Other filtration ratings available on request
Special number For special design (number will be issued after technical clarification in Head Office)

EN **7.722.1**.3/05.22

## 7. DIMENSIONS

#### RF4WL3-EU



**RF4WL3-EPT** 



The dimensions indicated have ± 10 mm tolerances. Technical modifications are reserved.

## NOTE

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The information in this brochure relates to the operating conditions and applications described.

For applications and/or operating conditions not described please contact the relevant technical department.

Subject to technical modifications.

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