HYDAC INTERNATIONAL

Automatic back-flushing filter
AutoFilt® RF15

Specifications	
Nominal size:	DN 50 - DN 250
Q_{max}:	600 m³/h
p_{max}:	10 bar
Filtration ratings:	10–34 µm

1. GENERAL

Product description
- Self-cleaning automatic filter AutoFilt® RF15
- Separation of solid particles from fluids
- Thanks to various optionally available automation technologies, also suitable for Industry 4.0.

Filter element technology
- Cleaning directly at the mesh (scanner technology)
- Pleated filter element
- Wire mesh: 10 to 34 µm

Product advantages
- No external power supply
- No use of external fluid
- Stand-alone filter operation
- Very low flushing volumes
- No pressure drop during back-flushing
- Highly efficient back-flushing even under low pressure conditions

Optional features
- Custom made housing (engine mounted)
- Double safety thanks to bypass valves including safety filtration
- Alternative differential pressure monitoring systems
- Rotation monitoring
- Pressure monitoring in the back-flush line
- Magnet
- Drain/air vent with ball valve
- Classification society acceptance in acc. with: DNV, BV, ABS, etc.

Technical specifications of standard models

Size	Pressure range (bar)	Connection inlet/outlet	Connection, back-flush line (PN 16)	Weight (kg)	Volume (l)
2	10	DN 50	G 1"	50	10
3	10	DN 80	G 1"	60	15
4	10	DN 125	DN 32	100	20
5	10	DN 150	DN 32	115	30
6	10	DN 200	DN 50	260	80
7	10	DN 250	DN 50	320	95

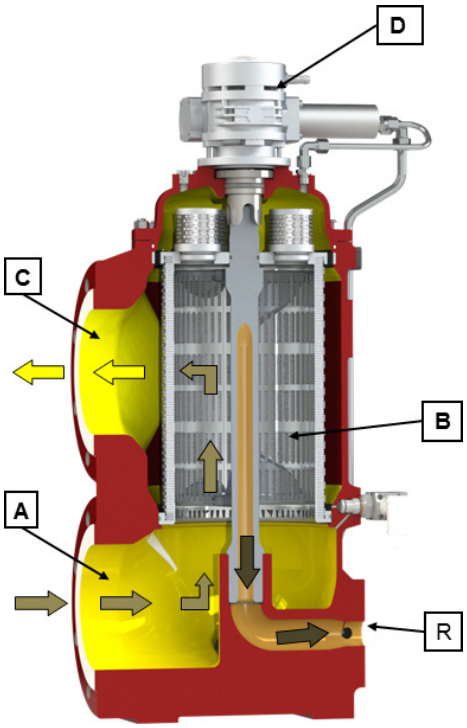
2. FUNCTION

FILTRATION

The medium to be filtered enters the filter housing via the filter inlet (A) and flows through the filter element (B) from the inside to the outside and leaves the filter via the filter outlet (C). Due to the flow direction through the filter, particles are collected on the inside of the filter element.

During the filtration, the flushing arm rotates continuously and the dirt particles are flushed out of the filter via the back-flush line (R).

Filtration



BACK-FLUSHING IN GENERAL

The automatic back-flushing is performed continuously:

The hydraulic drive (D) rotates the flushing arm (E) over the segments of the filter element that are to be cleaned.

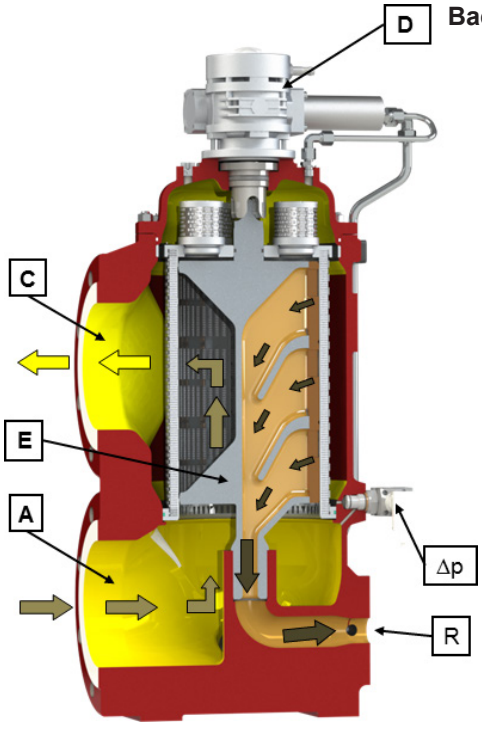
The drop in pressure between filter outlet (C) and back-flush line (R) causes the individual segments to be cleaned. During this process, the remaining segments of the filter element continue filtering to ensure uninterrupted filtration.

The permanent back-flushing prevents a drop in the operating pressure. The segmentation of the filter element ensures highly effective cleaning of the filtration mesh while operation is in progress, with a very low flushing volume. Monitoring of the rotation function is available as an option and can be evaluated electronically.

The individual segments of the filter elements are cleaned one after the other and permanently with no interruption to the filtration. The flushing arm is powered either hydraulically or electrically.

The hydraulic drive is optimised so that it begins operating even at low operating pressures and has a low displacement.

Back-flushing

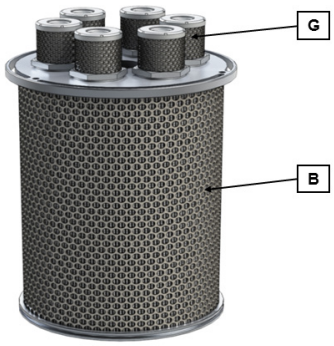


EMERGENCY OPERATION (SAFE TO PORT)

As an option, the AutoFilt® RF15 can be equipped with bypass valves (G). These bypass valves are intended for emergency operation, which occurs in the event of an error in the automatic cleaning. If the differential pressure exceed 2.0 bar, the bypass valves open and release the flow through the safety filter stage installed in the valve. The filter is then in emergency operation.

Before emergency operation starts, a differential pressure monitoring system (Δp) can trigger an alarm and notify the operator of a potential problem.

Filter element



3. CLOGGING INDICATORS

Type **Clogging indicator/differential pressure monitoring**	Figure	Description
Visual-electrical **VD x LZ1**		• Visual display by means of LED • Electrical signal (normally closed or normally open) • Automatic reset
Differential pressure transmitter **HPT 500**		• 4 to 20 mA, RL max. UB – 3 V / 0.02 A • 0 to 10 V, load min. = 2 kΩ • 0.5 to 4.5 V ratiometric, load min. = 5 kΩ

4. FILTER CALCULATION*

CHECKLIST FOR FILTER CALCULATION

STEP 1: CHECKING THE PREREQUISITES

- It is crucial when operating the AutoFilt® RF15 that there is a pressure differential between the back-flush line and the filter inlet of at least 3 bar
- Application data are determined using filter questionnaires
- The maximum permitted temperature for all AutoFilt® RF15 is 80 °C – up to 100 °C is possible for short-term operation

STEP 2: FILTER DIMENSIONING

- The filter is sized based on the calculation table

STEP 3: DETERMINING THE FILTRATION RATING

- For filtration ratings other than those shown in the calculation table or a different viscosity, the flow rate should be adjusted in accordance with the application and the expected particulate loading of the fluid. The head office must be contacted!

CALCULATION TABLES

Size	DN	Maximum flow rate for 25µm (m^3/h)[1)]	Maximum flow rate for 34µm (m^3/h)[1)]
RF15-2	50	28	28
RF15-3	80	70	80
RF15-4	125	132	154
RF15-5	150	194	230
RF15-6	200	350	420
RF15-7	250	520	600

Legend:

[1)] The flow rates specified apply to lubricating oil of classes SAE30 / SAE40. For other lubricating oils, the head office should be consulted before selecting the filter size.

* Please contact our head office if you have any queries regarding filter calculation.

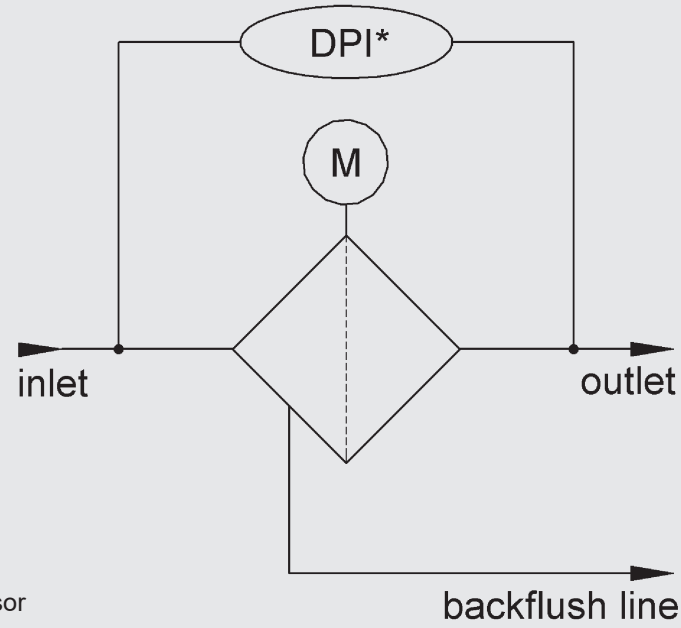
5. FILTER CONFIGURATION*

	Standard	Optional
Drive variants	H = hydraulic motor	E = electric motor, rotation monitoring flushing valve
Connection voltages	All current international connection voltages and frequencies can be implemented	
Electrical protection classes	IP55	Other IP protection classes on request
Explosion protection	Not available	
Housing calculation / housing manufacture	AD 2000 / PED 2014/68/EU Pressure Equipment Directive	Classification society acceptance in acc. with: DNV, BV, ABS, etc.
Flange connections	DIN EN flanges or square flanges in acc. with HYDAC factory standard	
Flange geometry	Inlet/outlet 0°, back-flushing port 180°	For engine mounted filters, a custom flange pattern is possible (consult with Head Office)
Housing materials	EN GJS 400-18LT / SA395	
Materials of internal parts	Stainless steel / steel	
Material of filter elements	Stainless steel / steel / aluminium	
Corrosion protection, external	Primer	• Multiple-layer coatings (on request) • Special paints and coatings according to customer specifications (on request)
Internal corrosion protection	Hydraulic oil HLP46	
Sealing materials	NBR	FKM on request
Measurement of pressure difference	HYDAC (see 3 Clogging indicators)	
Documentation	• Operation instructions • Installation drawing • Manufacturer certification to 2014/68/EU DG24	Customised

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

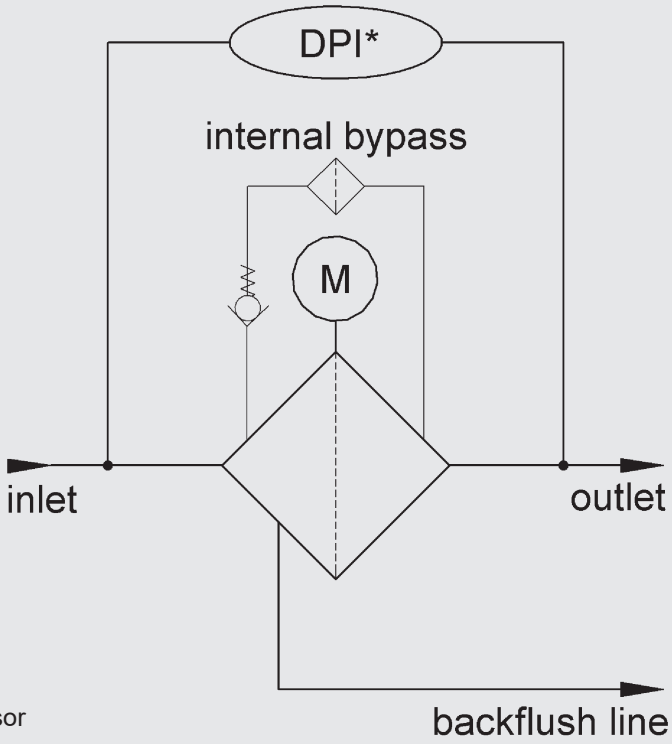
6. HYDRAULIC CIRCUIT

AutoFilt RF15® without internal bypass valves



Legend
DPI* = differential pressure sensor

AutoFilt RF15® with internal bypass valves



Legend
DPI* = differential pressure sensor

7. MODEL CODE

MODEL CODE AUTOFILT® RF15

RF15C - 3 EG 0 - E 1 1 0 - N 1 3 B - 2 / ZP34 - (123) 1234567

Type
AutoFilt®
C = continuous backflush filter

Size
2; 3; 4; 5; 6; 7

Connection size

Size	Pressure level	Flange type															
		Weld-on or threaded flange acc. to HYDAC standard (counter flange included in delivery)											Flange acc. to EN 1092-1				
RF15	PN	**A**	**AG**	**B**	**BG**	**C**	**CG**	**D**	**DG**	**E**	**EG**	**F**	**G**	**H**	**I**	**J**	**K**
		DN25	G1"	DN32	G1 1/4"	DN40	G1 1/2"	DN50	G2"	DN65	G2 1/2"	DN80	DN100	DN125	DN150	DN200	DN250
2	10	✓	✓	✓	✓	✓	✓	☑	✓								
3		→								✓	✓	☑					
4		→											✓	☑			
5		→												✓	☑		
6		→													✓	☑	
7		→														✓	☑

☑ = Standard
✓ = Optional
→ Y = Customer-specific connection size / flange design

Version
0 = only AutoFilt® RF15
1 = AutoFilt® RF15 with bypass filter "BF"
2 = AutoFilt® RF15 with Oil Treatment Unit "OTU"
3 = AutoFilt® RF15 with "BF" and "OTU"
4 = 2 x AutoFilt® RF15
5 = 2 x AutoFilt® RF15 + 2x "OTU"

Type of drive
E = electric drive
H = hydraulic drive

Supply voltage (not applicable for drive type "H")
1 = 1 x 230V / N / PE 50Hz
2 = 3 x 400V / N / PE 50Hz
Y = customer-specific design

Differential pressure monitoring
0 = without (dp-connection acc. to Hydac standard on the filter is maintained)
1 = differential pressure switch VD (optical / electrical)
2 = differential pressure transmitter HPT 500 (analog signal)
Y = customer-specific design

Junction box
0 = without junction box (cables must be connected directly to consumers)
A = with junction box (all consumers on terminal strip)
Y = customer-specific design

Sealing material
N = NBR
V = FKM

Optional equipment (multiple selection possible)
0 = without
1 = filter element with safety filter stage and bypass valves
2 = rotation monitoring via inductive proximity switch
3 = magnetic plug (wear indicator)
4 = pressure transmitter in backflush line
5 = drain / vent with ball valve

Class approval / other documentation (multiple selection possible)
0 = without
A = class approval ABS (American Bureau of Shipping)
B = class approval BV (Bureau Veritas)
C = class approval CCS (Chinese Classification Society)
D = class approval DNV (Det Norske Veritas)
I = class approval IRS (Indian Register of Shipping)
K = class approval KRS (Korean Register of Shipping)
L = class approval LR (Lloyd's Register)
N = class approval NK (Nippon Kaiji Kyōkai)
R = class approval RINA (Registro Italiano Navale)
S = Certificate of Conformity (CoC)
T = Declaration of materials (SDoC)
U = acceptance test certificate 3.1 acc. to DIN EN 10204 for design, pressure and functional tests
V = material inspection certificates 3.1 acc. to DIN EN 10204 for pressure-bearing media-contacting housing parts

Modification number
2 = the latest version is always supplied

Filter element: Version, filter fineness [in µm]
ZP = **cylindrical pleated filter elements + specification of filter fineness in µm (ß2)**
(25 µm / **34 µm** / 48 µm - other filter finenesses on request)

Customer-specific version (not applicable if not specified)

Special number
For special design (number will be issued after technical clarification in Head Office)

Bold printed = Standard

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NOTES

NOTE

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.

HYDAC Process Technology GmbH
Am Wrangelflöz 1
66538 Neunkirchen, Germany
Phone: +49 6897 / 509-1241
Fax: +49 6897 / 509-1278
Internet: www.hydac.com
E-mail: prozess-technik@hydac.com