

Automatic filter

AF 179 S

with external pressure cleaning and integrated cyclone effect
Nominal diameter DN 100, 125, 150, 200

1. Features

MAHLE automatic backflush filters are suitable for all applications where low or medium-viscosity liquids have to be filtered.

These compact, inline filter systems are designed for automatic cleaning. The system is cleaned by rotating the filter cartridge and backflushing with external or internal pressure media.

Advantages:

- Low lifecycle costs because no filter material is consumed
- Cleaning without interrupting filtration
- Precise separation quality in accordance with the surface filter principle
- Top-quality, asymmetric filter medium made of multiple-sintered stainless steel fleece on a rugged core element
- Efficient filter cleaning assures maximum process stability
- Solid construction and high-quality materials for a long service life
- Minimal liquid loss during cleaning
- Filter cleaned one segment at a time with a high backflush pulse
- Actual filter rating and nominal separation are indicated
- Integrated preseparation thanks to tangential inflow and preseparator tube
- Material variants open up a wide range of applications (also for high abrasive media)
- Modular MAHLE Vario system for optimum filter selection
- Optional: Gas-tight shaft seals available
- Optional: Application in Ex zone 1 and 2
- Optional: Certification for Pressure Equipment Directive (PED)
- Optional: Acceptance for ASME U-Stamp
- Easy maintenance
- Worldwide distribution



2. Operating principle

The MAHLE AF 179 S backflush filter belongs to the large Vario series. The compact MAHLE automatic filter system is used for fine and micro-filtration of a variety of low-viscosity liquids.

This inline pressure filter consumes no filter material, which means there is also no need for subsequent disposal. The filter is cleaned without interrupting operation. The concentrated solids are drained off simply by opening the system for a short time.

The medium to be cleaned is guided into the filter housing under pressure. It flows inward through the MAHLE segmented element. Particles settle on the surface of the filter medium. The filtered fluid exits the filter housing at the top opposite the inlet connection.

The integrated preseparator relieves the load on the segmented element, particularly from coarse and heavy particles. This permits a tangential flow around the preseparator tube and the deflection edges. The filter is cleaned when a preset differential pressure limit, a set interval or a defined filtered fluid quantity is reached.

The segmented element is turned as the cleaning and external pressure valves are opened. The segments are then guided one at a time past the pressure channel housing on the inside and the backflush channel on the outside. This causes them to open and close alternately. The integrated external pressure accumulator is pretensioned during closing, so that when one segment opens, an outward surge cleans the separated particles from the filter material. As a result of this pulse cleaning principle, the particles are catapulted out, collected in the backflush channel and discharged almost entirely with external medium. One turn suffices to clean all segments.

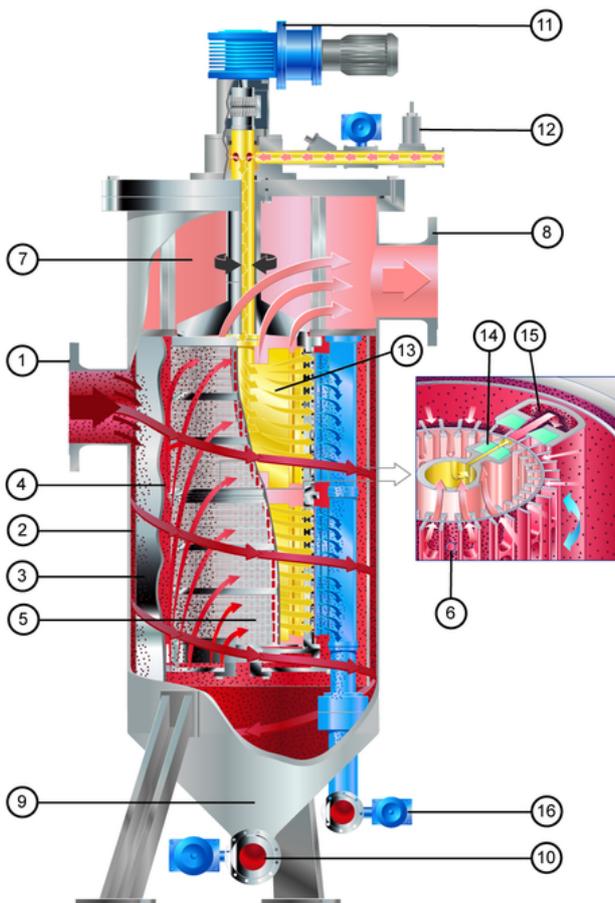
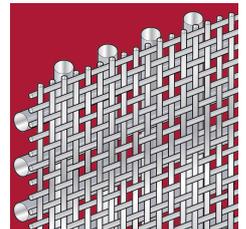
The residue that has settled in the collection cone can be emptied via the drain valve either when the machine is at a standstill or during filtration.

All filters in the MAHLE Vario series are protected by various patents.

Used MAHLE filter cartridges in the AF 179 S backflush filter:

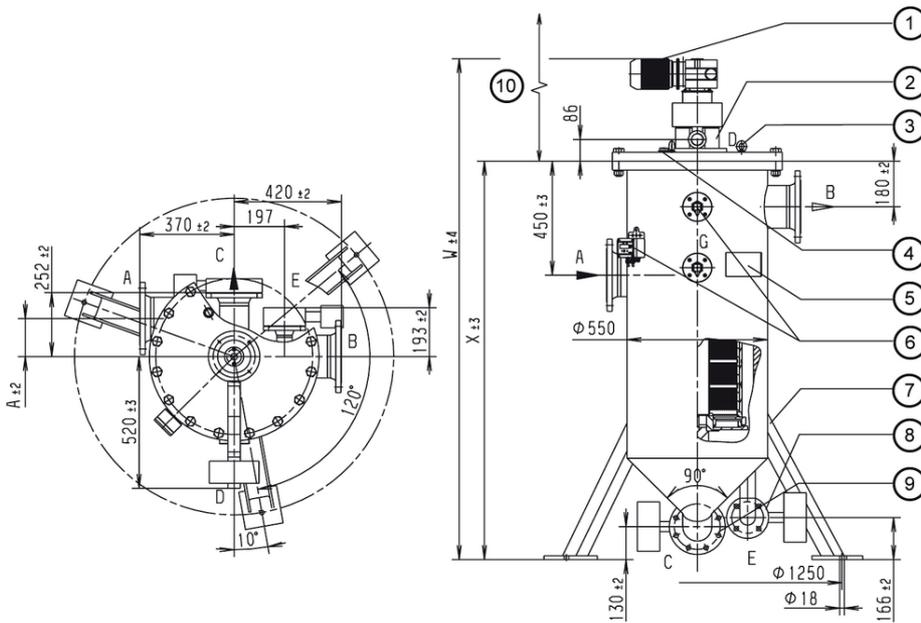
MAHLE topmesh cartridges (standard):

- Good cleanability due to asymmetric design
- Large effective filter surface
- Defined particle retention
- Several material combinations possible



- 1 Inlet connection
- 2 Outer inlet plenum
- 3 Preseparator tube
- 4 Inner inlet plenum
- 5 MAHLE segmented element
- 6 MAHLE filter material
- 7 Plenum for filtered fluid
- 8 Outlet connection for filtered fluid
- 9 Residue collection cone
- 10 Drain valve
- 11 Drive motor
- 12 External pressure connection, external pressure and backflush valves and gauge P_f
- 13 External pressure accumulator
- 14 External pressure nozzle
- 15 Backflush channel (outside)
- 16 Cleaning valve (P3 control throttle)

3. Technical data



- 1 Cleaning drive: can be mounted turned 90°, 180° or 270°
- 2 Optional: Automatic external pressure valve
- 3 Lifting eyebolts
- 4 Vent screw G1
- 5 Name-plate
- 6 Optional: Differential pressure indicator with differential pressure transmitter G1
- 7 Feet (3 x 120°)
- 8 Optional: Automatic back-flush valve
- 9 Optional: Drain valve, manual or automatic mode
- 10 Clearance required Z in mm

Filter data

Max. operating pressure 10 bar

Max. operating temperature: 100 °C

Materials:

- Housing and cover: St. 1.4571
- Internals: St. 1.4571/A2
- Bearing bushes: PTFE based
- Seals: FPM (Viton)
- Coiled cartridge: St. 1.4571 or 1.4571/A1 (Δp max. 6 bar)

Cover fastening:

- 16x M24 hexagon screws
- 16x M24 hexagon nuts

Optional: Ex protection

acc. to ATEX 94/9/EC:

- Electrical components in Ex II 2G T3
- Mechanical design in Ex II 2G c T3

Connections and nominal diameters:

- A-inlet, B-outlet: DN100, DN125, DN150, DN200
- C-drain: DN50
- D-external pressure: G1 1/2
- E-backflush: DN50
- G-indicator: DN25
- All threaded holes acc. to DIN 3852 X
- flanges acc. to EN 1092-1/11B1/PN 40

Drive shaft seal:

Lip seal with O-ring

Outside coating:

Synthetic resin primer, blue acc. to RAL 6007

Motor data

Worm gear motor

Multi-range winding

V	Hz	kW	U/min	A
Δ 230 \pm 10%	50	0.18	4.26	1.3
λ 400 \pm 10%	50	0.18	4.26	0.8
Δ 255 \pm 10%	60	0.20	5.1	1.3
λ 440 \pm 10%	60	0.20	5.1	0.8

Protection class: IP55; insulation class F; output torque: 252 Nm

Type	W [mm]	X [mm]	Z [mm]	Volume [l]	Weight [kg]
AF 179123-.1.	1638	1232	860	239	460
AF 179133-.1.	1978	1572	1200	319	500
AF 179153-.1.	2318	1912	1540	399	540
AF 179163-.1.	2658	2252	1880	479	580

Nominal diameter	Dimension A [mm]
DN 200	165
DN 150	190
DN 125	205
DN 100	215

Differential pressure stability

Segmented elements (aluminium and stainless steel versions): 6 bar

Other types available on request!

Technical data is subject to change without notice

4. Design and application

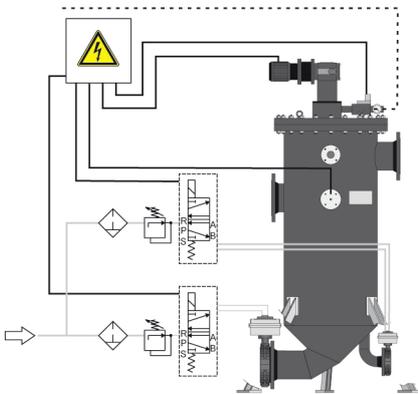
Cartridge type (see section 6)	Total surface in cm ²	Gap width in µm / effective filter surface in cm ²								
		5	10	20	30	40	60	80	100	200
AF 1002013	2615	2129	2129	2129	2129	2129	2129	2129	2129	2129
AF 1002113	Effective filter surface in %	4	6	32	39	40	40	43	45	48
	Effective filter surface in cm ²	85	128	681	830	851	851	915	958	1022

Recommended design

The table shows the filter surfaces for one filter cartridge.

For AF 17913.. Filter surface x 2
 AF 17915.. Filter surface x 3
 AF 17916.. Filter surface x 4

Cleaning and emptying



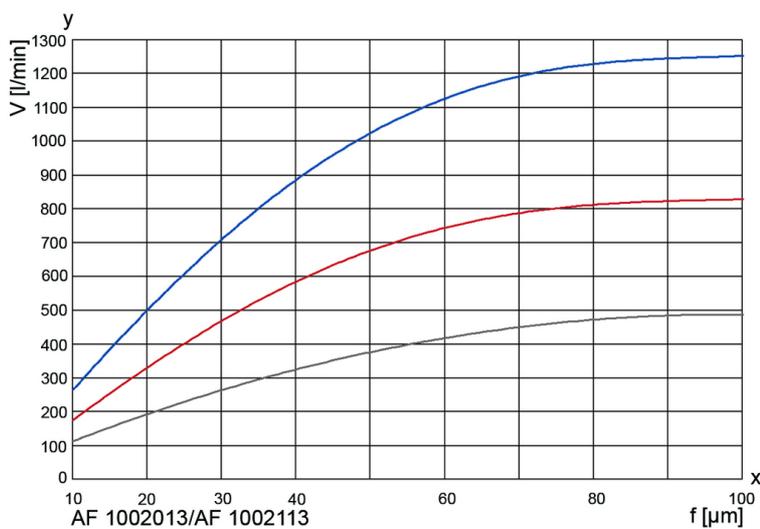
Fully automatic operation

Filtration usually takes place under pressure. The filter is cleaned after a programmed time or a preset number of cycles or according to the differential pressure. We recommend cleaning the system at a differential pressure of approximately 0.5 to 0.7 bar. The cleaning motor is operated for around 14 s (about one turn of the filter cartridge). The external pressure and cleaning valves remain open for this period. This suffices to clean the filter thoroughly. The drain valve is opened in order to empty the filter. Depending on the residue concentration, this can either take place directly after cleaning or be time or cycle controlled. The opening time of the drain valve is 2 to 3 s.

Refer to the Instruction Manual for further information

MAHLE's team of specialists will be pleased to assist in any way. Tests can be carried out in the absence of reliable evaluation criteria.

5. Efficiency curves



The curves indicate the volume flow through the complete filter system (filter housing including cartridge) and are referred to a differential pressure of 0.3 bar. Specific process information is essential to guarantee reliable operation of an automatic filter.

Viscosity in mm²/s

Blue line: 1 mm²/s
 Red line: 33 mm²/s
 Grey line: 100 mm²/s

y = Volume flow V [l/min]

x = Gap width f [µm]

6. Type number key

Type number key with selection example for AF 179143-711-53660/S

Size

AF 17912	1 x 300x350	No. of steps x diameter x length [mm]
AF 17913	2 x 300x350	No. of steps x diameter x length [mm]
AF 17915	3 x 300x350	No. of steps x diameter x length [mm]
AF 17916	4 x 300x350	No. of steps x diameter x length [mm]

Cleaning drive

- 3** Gear motor 230/400 V, 50 Hz or 266/460 V, 60 Hz
- 4** Gear motor 230/400 V, 50 Hz Ex II 2G T3

Inlet and outlet connections

- 6** DN100
- 7** DN125
- 8** DN150
- 9** DN200

Permissible operating pressure in bar (housing/cover)

- 1** PN10

Material Seal FPM, bearing PTFE

- 1** Standard; aluminium, nodular cast iron; steel
- 2** Stainless steel 1.4571/1.4581
- 3** Standard; steel, internals stainless steel 1.4301/1.4571

Differential pressure indicator and gauge

- 5** PiS 3175, digital Δp gauge, 2 pressure transmitters settable from 0 to 16 bar

Valves and control throttles

- 3** External pressure valve for liquid, 24 V G1½
- 4** External pressure valve for liquid, 230 V G1½
- 8** Like 3 but with P3 control throttle and P3 gauge
- 9** Like 4 but with P3 control throttle and P3 gauge

Drain valve

- 2** Ball valve, electropneumatic 24 V DC
- 3** Ball valve, electropneumatic 230 V AC
- 4** Ball valve, electric 24 V DC
- 5** Ball valve, electric 230 V AC

Cleaning valve

- 6** Flap, electropneumatic 24 V/10 bar
- 7** Flap, electropneumatic 230 V/10 bar
- 8** Flap, electric 24 V/10 bar
- 9** Flap, electric 230 V/10 bar

Optional features

- 0** Without/special version

AF 17913 **3** **- 7** **1** **1** **-5** **3** **2** **6** **0** **-XXXX (end number for special version)/S**

End number	Special version
3001	Standard complete inner assembly, without housing or drive
3002	Standard complete inner assembly, without housing, with drive
3700	PTFE seals
Other numbers	On request

Type number key with selection example for coiled or welded cartridges for AF 1002013-006

Series							/E1
AF 100	Segmented element with topmesh						
	Material	Inner Core	Filter medium	Clamp rings	Wire width in mm		
	Segmented element						
	20	Hard coated Al	1.4571	1.4571	-		
	21	1.4571	1.4571	1.4571	-		
	Overall length Diameter x length in mm						
	13	300 x 350					
	Gap width/rating in µm (see 4. Design and application)						
	0005	5 µm	003	30 µm	008	80 µm	
	001	10 µm	004	40 µm	010	100 µm	
	002	20 µm	006	60 µm	020	200 µm	
	Other filter ratings on request						
AF 100	20	13	-006				/E1

7. Spare parts

No.	Designation	Material no.	
		FPM/C steel	PTFE/VA
1	Bush kit		70310285
2	Seal kit (complete)	70310287	
3	Backflush channel moulding AF 119		70310292
4	Backflush channel moulding AF 139		76364053
5	Filter cartridge	See name-plate	

Please contact us for detailed technical information, any open questions about options, accessories and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.

Comprehensive documentation on our filter range, filter elements and accessories can be provided. About installation and operation, please refer to the Instruction Manual.

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