

Automatic filter AF 133 G

with external pressure cleaning
Connection sizes: G2, screw-in flange DN 50 and DN 65, cast design

1. Features

MAHLE automatic backflush filters are suitable for all applications where low-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 robust inner core
- Efficient filter cleaning assures maximum process stability
- Solid construction and high-quality materials for a long service life
- 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
- Material options open up a wide range of applications
- Modular MAHLE Vario system for optimum filter selection
- Easy maintenance
- Worldwide distribution



2. Operating principle

The MAHLE AF 133 G backflush filter belongs to the Vario series. The compact MAHLE automatic filter system is used for fine and micro-filtration of a variety of lowviscosity liquids.

This inline pressure filter consumes no filter material, which means there is also no need for subsequent disposal. The filter can only be cleaned after switching off the system.

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.

Particles settle on the filter medium.

The filter is cleaned when a preset differential pressure limit, a set interval or a defined filtered fluid quantity is reached.

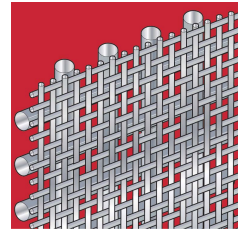
The segmented element is turned as the drain and external pressure valves are opened. The segments are then guided one at a time past the pressure channel housing on the inside. This causes them to open and close alternately. The integrated external pressure accumulator is pretensioned during closing,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

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

The AF 133 G backflush filter can be used with either topmesh or notched wire cartridges:

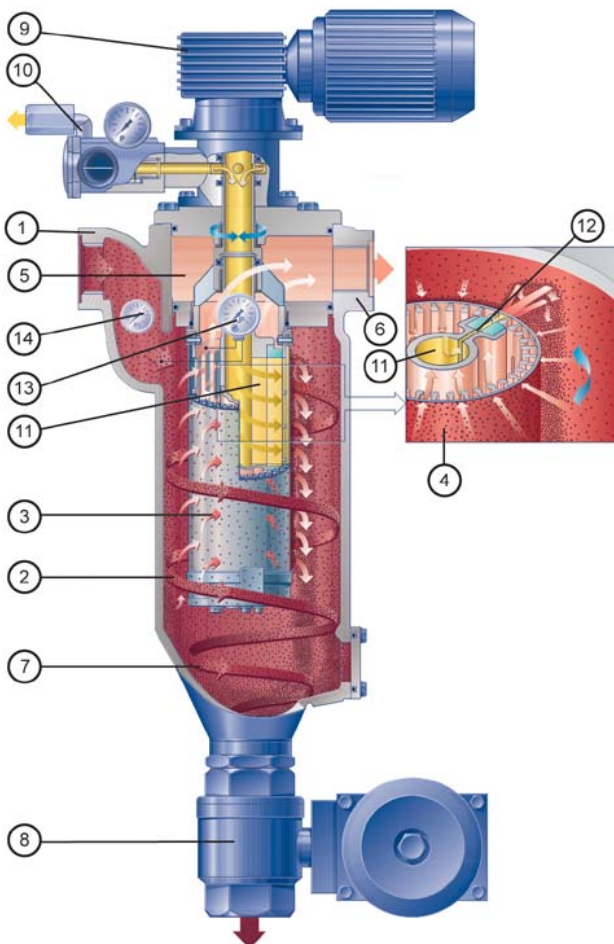
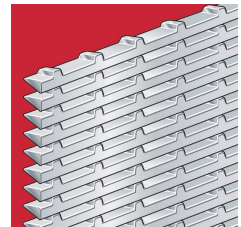
MAHLE Topmesh (Standard):

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

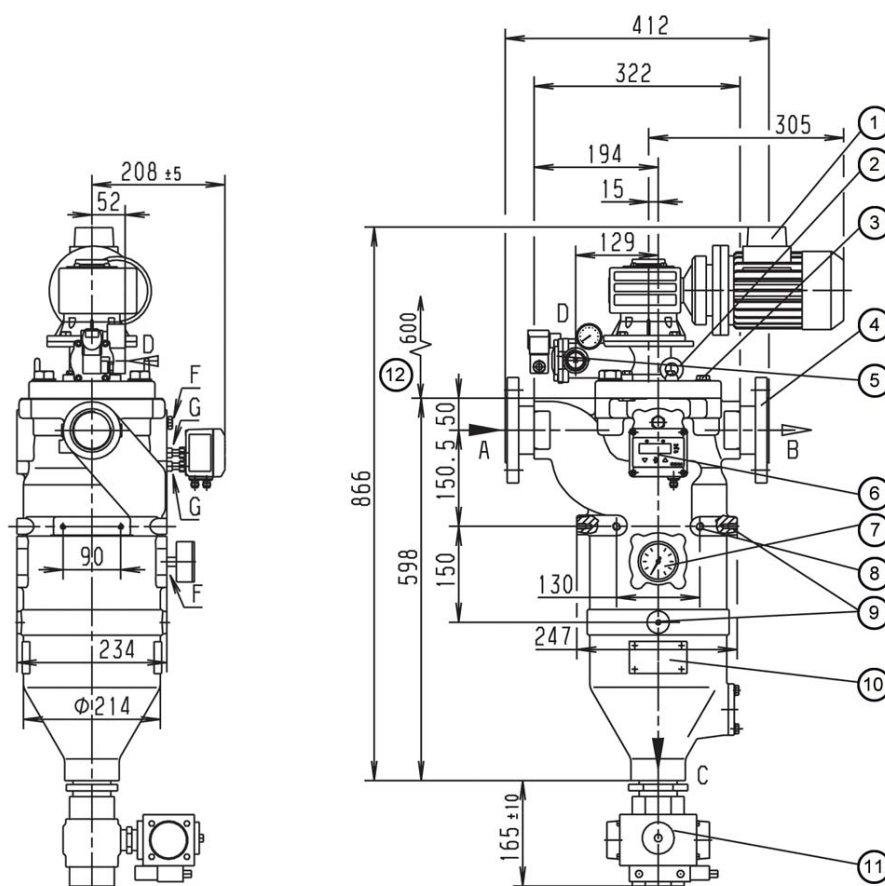


MAHLE notched wire cartridges:

- High differential pressure stability
- High wear resistance in extreme applications
- Good backflush properties
- Several material combinations possible



- 1 Tangential inlet connection
- 2 Inlet plenum
- 3 MAHLE segmented element
- 4 MAHLE filter material
- 5 Plenum for filtered fluid
- 6 Outlet connection for filtered fluid
- 7 Residue collection cone
- 8 Drain valve
- 9 Drive motor
- 10 External pressure connection, external pressure and check valves and gauge P_f
- 11 External pressure accumulator
- 12 External pressure nozzle
- 13 Differential pressure contact gauge
- 14 P1 gauge



- 1 Cleaning drive: can be mounted turned 90°, 180° or 270°
- 2 Lifting eyebolts
- 3 Vent screw G1/4
- 4 If DN 65 screw-in flanges are used, the motor is mounted turned 90°
- 5 External pressure valve
- 6 Optional: Differential pressure indicator/switch
- 7 Optional: P1 gauge
- 8 Mounting holes M12
- 9 Mounting holes M8
- 10 Name-plate
- 11 Optional: Automatic drain valve
- 12 Clearance required = 600 mm

Filter data

Max. operating pressure: 16 bar

Max. operating temperature: 100 °C

Materials:

- Housing and cover: Nodular cast iron
- Internals: Nodular cast iron, steel
- Bearing bushes: PTFE based
- Seals: FPM (Viton)
- Segmented element: 1.4571 or 1.4571/Al (Δp max. 10 bar)
- Cover fastening: 4 x M20 hexagon screws
- Electrical components in Ex II 2G T3
- Mechanical design in Ex II 2G c T3
- A-inlet, B-outlet, C-drain: G2
- D-external pressure: G1 (air: must be reduced to G1/2 by the customer)
- F-gauge: G1/4
- G-indicator: G1/8
- All threaded holes acc. to DIN 3852 form X
- Optional: A/B/C screw-in flanges DN 50 or DN 65 acc. to EN 1092-1/05A

Drive shaft seal:

Lip seal with O-ring

Outside coating:

Synthetic resin primer, blue acc. to RAL 5007

Motor data

Worm gear motor

Multi-range winding

V	Hz	kW	rpm	A
Δ 230 ± 10%	50	0.18	9.3	1.2
λ 400 ± 10%	50	0.18	9.3	0.7
Δ 266 ± 10%	60	0.22	11.2	1.1
λ 460 ± 10%	60	0.22	11.2	0.7

Protection class: IP55; insulation class F; output torque: 97Nm

Worm gear motor Ex

Ex II 2G T3, output torque: 97 Nm

Weight: 92 kg

Volume: 12 l

Differential pressure stability

Segmented elements with topmesh or stainless steel media: 10 bar

Segmented elements with V-profiled, notched wire winding: 25 bar

Other types available on request!

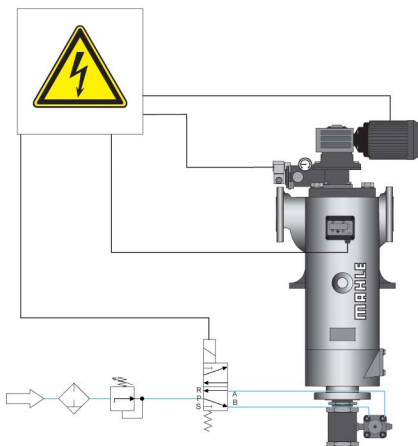
Technical data is subject to change without notice

4. Design and application

Cartridge type (see section 6)	Total surface in in cm ²	Filter rating in μm / effective filter surface in cm ²								
		5	10	20	30	40	60	80	100	200
AF 170XX6	763		637	637	637	637	637	637	637	637
	Effective filter surface in %		6	32	39	40	40	43	45	48
	Effective filter surface in cm ²		38	204	248	255	255	274	286	306

Recommended design

Possible cleaning and emptying modes



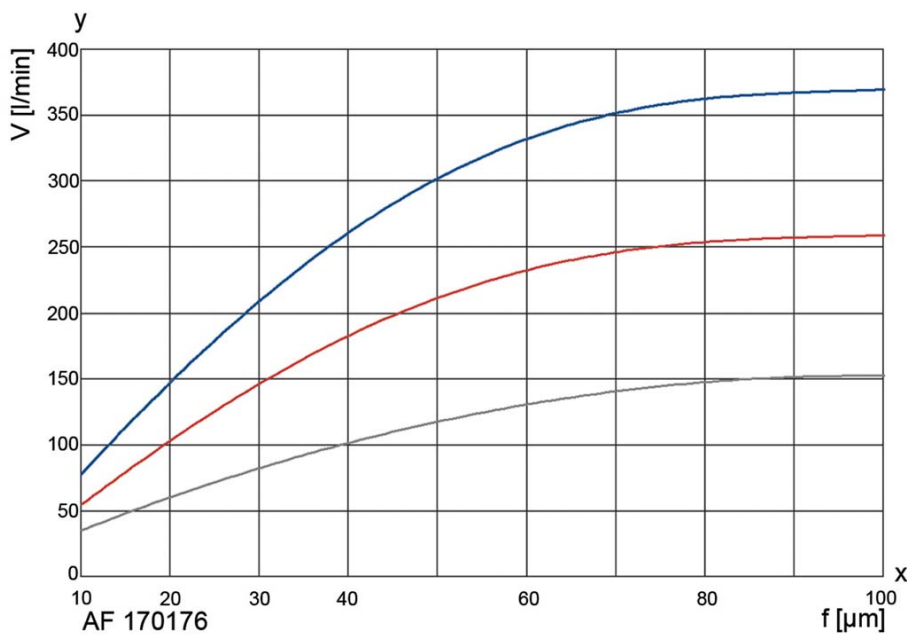
Fully automatic operation:

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 7 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.

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

- 1 mm²/s
- 33 mm²/s
- 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 13363-1321-43200/G3

Size

AF 1336 1 x 110x265 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

- 3 DN 50 for cast stainless steel
- 13 G2
- 14 Screw-in flange DN 50 for cast design
- 15 Screw-in flange DN 65 for cast design
- 18 G2 1/2

Permissible operating pressure in bar (housing/cover)

- 1 PN 10
- 2 PN 16

Material Seal FPM, bearing PTFE

- 1 Housing and cover nodular cast iron, internals steel, aluminium
- 3 Housing and cover nodular cast iron, internals stainless steel 1.4301 / 1.4571

Differential pressure indicator and gauge

- 1 PIS 3076, switching level at 1.2 bar, static 63 bar, aluminium / FPM
- 2 PIS 3076, switching level at 0.7 bar, static 63 bar, aluminium / FPM
- 3 PIS 3160, digital Δp gauge, 2 switching levels settable from 0 to 6 bar
- 4 PIS 3160, digital Δp gauge, 2 switching levels settable from 0 to 1.6 bar
- 5 PIS 3165, digital Δp gauge, 2 pressure transmitters settable from 0 to 6 bar

Valves and control throttles

- 3 External pressure valve G1 for liquid, 24 V
- 4 External pressure valve G1 for liquid, 230 V

Drain valve

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

Cleaning valve

- 0 Without / special version

Optional features

- 0 Without / special version

AF 1336 3 - 13 2 1 -4 3 2 0 0 -XXXX (end number for special version)/G3

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 170, 140

Series							/E1
AF 170	Segmented element with topmesh						
AF 140	Segmented element with V-profiled, notched wire winding						
Material	Inner core	Filter medium	Clamp rings	Wire width in mm			
Segmented element							
17	Al	1.4571	St	-			
20	Hard coated Al	1.4571	1.4571	-			
21	1.4571	1.4571	1.4571	-			
Overall length Diameter x length in mm							
6	110 x 265						
Gap width / rating in µm							
001	10 µm	004	40 µm	010	100 µm		
002	20 µm	006	60 µm	016	160 µm		
003	30 µm	008	80 µm	025	250 µm		
Other filter ratings on request							
AF 170	17	6	-006				/E1

7. Spare parts for G3 version

No.	Designation	Material no.	
		FPM/C steel	PTFE/VA
1	Bush kit		70311579
2	Seal kit (complete)	70316111	70316118
3	Pressure channel moulding		76120810
4	Filter cartridge	See name-plate	

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