MAHLE Industry

Automatic metal-edge filter
AF 73 G/AF 93 G

with radial scraper cleaning
Connection size G2, screw-in flange DN 50 and DN 65

1. Features

MAHLE automatic metal-edge filters are suitable for all applications where low or high-viscosity liquids or pastes have to be filtered and homogenised.

These compact, inline filter systems can be designed for semi or fully automatic cleaning. The system is cleaned by rotating the filter cartridge against a spring actuated scraper. The AF 93 G version also has integrated preseparation.

Advantages:

- Extended filter service life due to the use of a cleanable element
- Cleaning is possible without interrupting filtration
- Precise separation quality in accordance with the metal-edge principle
- Sturdy filter cartridge made of triangular stainless steel wire on a rugged core element
- Efficient filter cleaning assures maximum process stability
- Solid construction and high-quality materials for a long service life
- Modular system for optimum filter selection (small Vario series)
- Modular MAHLE Vario system for optimum filter selection
- Material variants open up a wide range of applications
- Gas-tight shaft seals available optional
- Application in Ex zone 1 and 2 optional
- Certification for Pressure Equipment Directive (PED) according to category III PED EN for stainless steel design optional
- Easy maintenance
- Worldwide distribution

2. Operating principle

The MAHLE AF 73 G and AF 93 G metal-edge filters belong to the small Vario series. The MAHLE metal-edge filter system is used to filter and homogenise a wide range of liquids and pastes.

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

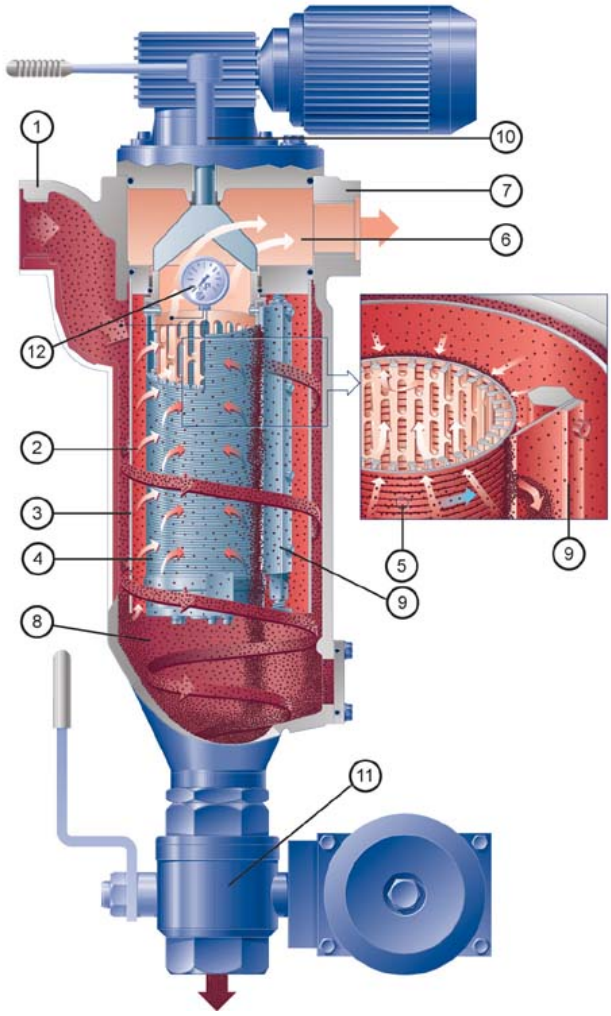
The medium to be cleaned is guided into the filter housing under pressure or in suction mode. It flows inward through the MAHLE filter cartridge. The solids are separated on the surface of the triangular filter cartridge wires. The filtered fluid exits the filter housing at the top opposite the inlet connection.

In the AF 93 G version, the tangential flow around the tube of the integrated preseparator relieves the load on the filter cartridge from coarse and heavy particles.

The filter is cleaned either when a preset differential pressure limit is reached or after a specified cycle time elapses. The MAHLE filter cartridge is rotated against a spring actuated scraper for this purpose. The special gap geometry of the filter cartridge guarantees efficient cleaning.

The particles or agglomerates are skimmed from the surface and settle in the collection cone. The patented filter cartridge bearing (AKF system) prevents high axial forces and facilitates the cleaning process.

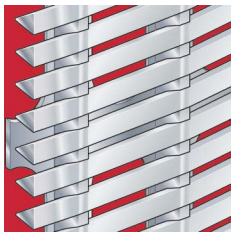
The residue that has settled in the collection cone can be emptied via the drain valve either when the machine is at a standstill or during filtration.



Used MAHLE filter cartridges in the AF 73 G and AF 93 G metal-edge filters:

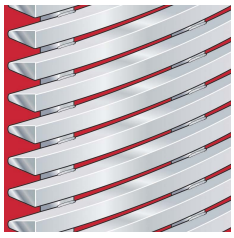
MAHLE coiled cartridge (standard):

- Optimum cleaning by means of sharp-edged triangular wire
- Large effective filter surface
- Small, precise gap widths
- High differential pressure stability and torsional strength
- Several material combinations possible



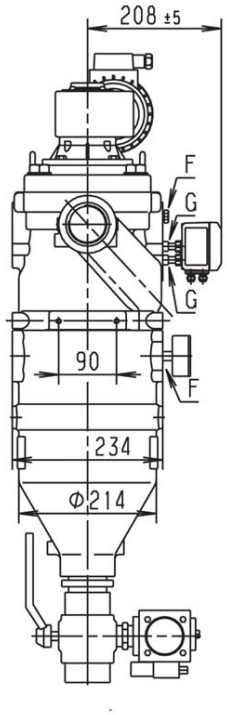
MAHLE welded cartridge:

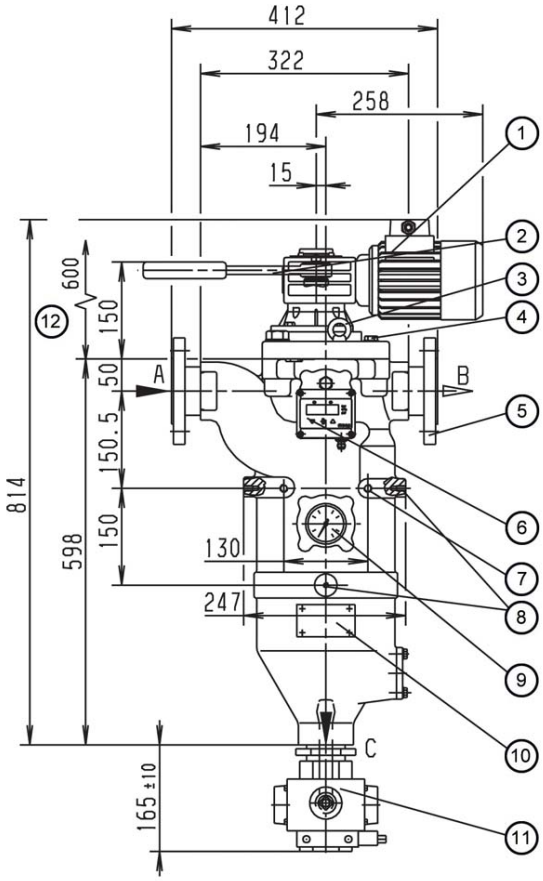
- High wear resistance to abrasive media
- Sturdy trapezoidal wire for high-viscosity media
- Welded design
- Manufactured in stainless steel



1 Tangential inlet connection
2 Inlet plenum
3 Preseparator tube for AF 93 G
4 MAHLE filter cartridge
5 Triangular wire winding
6 Plenum for filtered fluid
7 Outlet connection
8 Particle collection cone
9 Scraper
10 Cleaning drive with gear motor or hand ratchet
11 Drain valve (automatic or manual)
12 Differential pressure indicator/switch

3. Technical data





1 Cleaning drive, worm gear motor can be mounted at each 90° position
2 Optional ratchet
3 Lifting eyebolts
4 Vent screw G¼
5 Optional screw-in flanges DN 50 or DN 65 (the motor is mounted turned 90°)
6 Optional differential pressure indicator/switch
7 Mounting holes M12
8 Mounting holes M8
9 Optional P1 gauge
10 Name-plate
11 Optional drain valve, manual or automatic mode
12 Clearance required = 600 mm

Filter data

Max. operating pressure: 16 bar; optional 25 bar, 40 bar (higher pressure ratings on request)

Max. operating temperature: 100 °C (higher temperature ratings on request)

Materials: Housing and cover:
- Nodular cast iron
- Internals: Nodular cast iron, steel
- Bearing bushes: PTFE based
- Seals: FPM (Viton)
- Coiled cartridge: 1.4571 or 1.4571/Al (Δp max. 30 bar)
- Welded cartridge: 1.4571 (Δp max. 10 bar)

Cover fastening: 4 x M20 hexagon screws

Connections and nominal diameters:
- A-inlet, B-outlet, C-drain: G2
- F-gauge: G¼
- G-indicator: G1/8
- All threaded holes acc. to DIN 3852 X
- Optional A/B/C screw-in flanges DN 50, A/B 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	17	1.2
⅄ 400 ± 10%	50	0.18	17	0.7
Δ 266 ± 10%	60	0.22	21	1.1
⅄ 460 ± 10%	60	0.22	21	0.7

Protection class: IP55, insulation class F; output torque: 52 Nm

Optional: Ex protection acc. to Atex 94/9/EC
- Electrical design in Ex II 2G T3
- Mechanical design in Ex II 2G c T3

Weight: 73 kg (with ratchet) or 82 kg (with motor)
Volume: 12 l

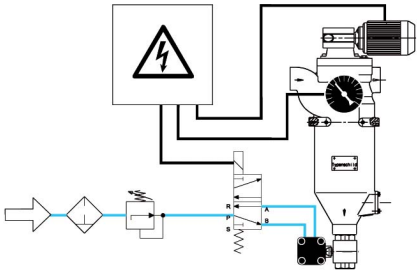
Other types available on request!
Technical data is subject to change without notice!

4. Design and application

Cartridge type (see section 6)	Total surface in cm²	Gap width in µm/ effective filter surface in cm²														
		30	40	50	60	80	100	130	160	200	250	360	500	1000	1500	2000
AF 6016	818	48	63	77	91	117	142	176	206							
AF 6026	818			50	59	77	95	119	142	170	203	264	328	473	555	608
AF 6036	814	48	63	77	91	117	141	175	206							
AF 6046	814			50	59	77	94	119	141	170	202	263	326	471	553	606
AF 6066	812									85	103	141	184	302	385	446
AF 6076	812			40	48	63	77	97	117	141	169	224	282			

Recommended design

Cleaning and emptying



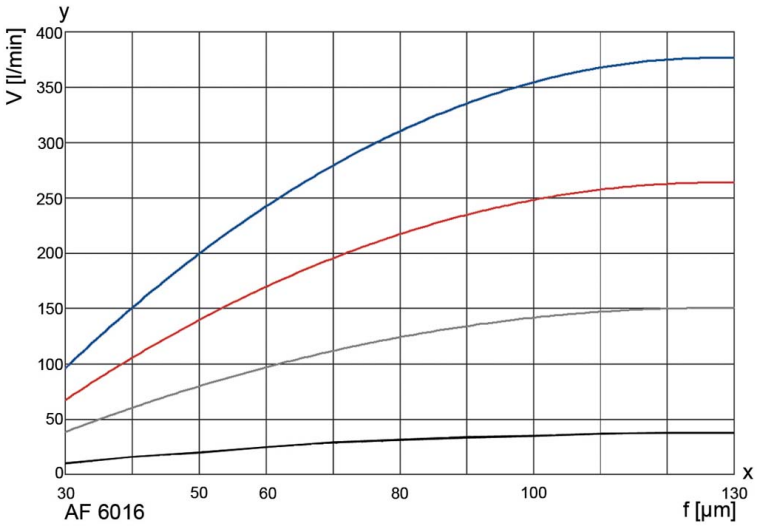
Fully automatic operation:

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 approximately 4 times the initial differential pressure. The cleaning motor is operated for around 10 seconds (about three turns of the filter cartridge). This is sufficient to clean the filter thoroughly. The motor may need to run continuously in exceptional cases. The drive shaft is always turned clockwise. The drain valve (x) is opened in order to empty the filter. Depending on the residue concentration, this can either take place synchronously with cleaning or be time or cycle controlled.
The opening time of the drain valve can be set between 2 and 6 seconds. The filter can be emptied in suction mode using a buffer or by interrupting the filtration process.

Semi-automatic and manual operation are also possible.

Refer to the Instruction Manual for further information.

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
500 mm²/s

y = Volume flow V [l/min]
x = Gap width f [µm]
mm²/s = cst

6. Type number key

Type number key with selection example for AF 7363-1321-40200/G3

Size

AF 736	1 x 110x265									No. of steps x diameter x length [mm]
AF 936	1 x 110x265									No. of steps x diameter x length [mm]
	Cleaning drive									
	2	Ratchet								
	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								
		13	G2							
		14	Screw-in flange DN 50 for cast design							
		15	Screw-in flange DN 65 for cast design							
		18	G2½							
			Permissible operating pressure in bar (housing/cover)							
			1	PN 10						
			2	PN 16						
			3	PN 25						
			4	PN 40						
			5	PN 63						
				Material Seal FPM, bearing PTFE						
				1	Housing and cover nodular cast iron, steel, aluminium					
				3	Housing and cover steel, grey cast iron or nodular cast iron, internals stainless steel 1.4301/1.4571					
				4	Housing and cover steel, grey cast iron or nodular cast iron, aluminium-free					
					Differential pressure indicator and switch					
					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				
					4	PiS 3170, digital Δp gauge, 2 switching levels settable from 0 to 16 bar				
					5	PiS 3175, digital Δp gauge, 2 pressure transmitters settable from 0 to 16 bar				
					8	PiS 3076, switching level at 2.2 bar, static 63 bar, aluminium/FPM				
					9	PiS 3076, switching level at 5 bar, static 63 bar, aluminium/FPM				
						Valves and control throttles				
						0	Without/special version			
							Drain valve			
							1	Ball valve, manual		
							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 736	**3**	**- 13**	**2**	**1**	**-4**	**0**	**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
4166	3 scraper assembled at outline (120°)
Other numbers	On request

Type number key with selection example for coiled or welded cartridges for AF 60

Series									**/E1**
AF 60	Coiled or welded cartridge with triangular wire winding								
	Material		**Core element**		**Filter medium**		**Clamp rings**	**Wire width in mm**	
	Coiled cartridge								
	1		Al		1.4571		1.4571	0.5	
	2		Al		1.4571		1.4571	0.8	
	3		1.4581		1.4571		-	0.5	
	4		1.4581		1.4571		-	0.8	
	Welded cartridge								
	6		-		1.4571		1.4571	1.8	
	7		-		1.4571		1.4571	1.0	
		Overall length Diameter x length in mm							
		6	110x265						
			Gap width/rating in µm (see 4. Design and application)						
			003	30 µm	**010**	100 µm		**036**	360 µm
			004	40 µm	**013**	130 µm		**050**	500 µm
			005	50 µm	**016**	160 µm		**100**	1000 µm
			006	60 µm	**020**	200 µm		**150**	1500 µm
			008	80 µm	**025**	250 µm		**200**	2000 µm
				Other filter ratings on request					
AF 60	**1**	**6**	**- 010**						**/E1**

7. Spare parts

No.	Designation	Material no.	
		FPM/C steel	PTFE/VA
1	Bush kit		70308169
2	Seal kit (complete)	70315877	70315880
3	Scraper		71116805
4	Spring kit		79753492
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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