

### Automatic metal-edge filter

### AF 71 H

with radial scraper cleaning  
High-pressure design up to 400 bar

#### 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 are designed for automatic cleaning. The system is cleaned by rotating the filter cartridge against a spring actuated scraper.

#### Advantages:

- Low lifecycle costs because no filter material is consumed
- 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
- Easy maintenance
- Worldwide distribution



## 2. Operating principle

The MAHLE AF 71 H metal-edge filter belongs to the small Vario series. The MAHLE metal-edge filter system is used to filter and homogenise a wide range of liquids and pastes.

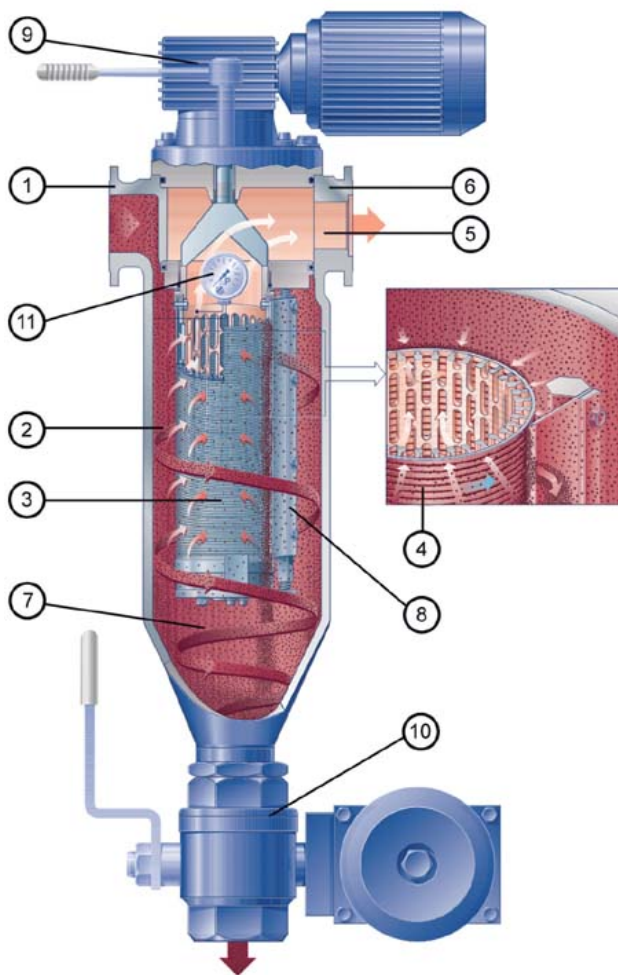
This compact, inline filter system consumes no filter material, which means there is also no need for subsequent disposal. The filter is cleaned either automatically or semi-automatically without interrupting operation. The concentrated solids are drained off simply by opening the system for a short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

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.

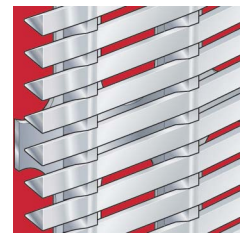


The schematic drawing deviates slightly from the actual technical lay-out.

**The AF 71 H metal-edge filter can be used with either coiled or welded cartridges:**

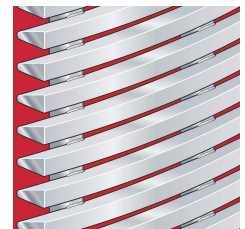
### MAHLE coiled cartridge (standard):

- 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



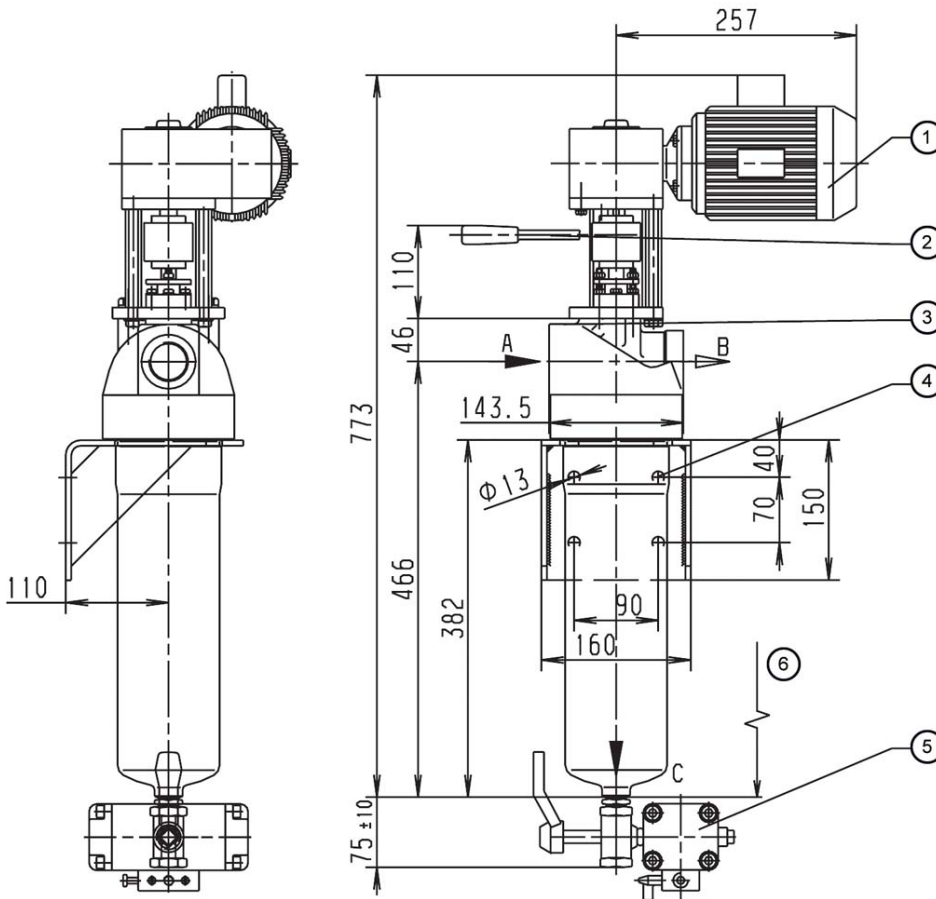
### MAHLE welded cartridge:

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



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

### 3. Technical data



- 1 Cleaning drive: can be mounted turned 90°, 180° or 270°
- 2 Optional: Ratchet
- 3 Name-plate
- 4 Mounting holes Ø13
- 5 Optional: Drain valve, manual or automatic mode
- 6 Clearance required = 260 mm  
Option: differential pressure switch

#### Filter data

- Max. operating pressure: 400 bar  
 Max. operating temperature: 100 °C  
 Materials:
- Filter head: Nodular cast iron 40
  - Filter bowl: Ck 15
  - Internals: St. 1.4301, nodular cast iron
  - Bearing bushes: PTFE based
  - Seals: FPM (Viton)
  - Coiled cartridge: 1.4571 or 1.4571/Al (Δp max. 40 bar)
  - Welded cartridge: 1.4571 (Δp max. 10 bar)
- 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: G1 1/4
  - C-drain: G1/2
  - All threaded holes acc. to DIN 3852 form X
- Drive shaft seal: Cup seal packing and 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
λ 400 ± 10%	50	0.18	17	0.7
Δ 266 ± 10%	60	0.22	21	1.2
λ 460 ± 10%	60	0.22	21	0.7

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

Worm gear motor Ex  
 Ex II 2G T3; output torque: 14 Nm

Weight: 10 kg (with ratchet) or 14 kg (with motor)  
 Volume: 2.5 l

#### Differential pressure stability:

Coiled cartridge: 40 bar  
 Welded cartridge: 20 bar

**Other types available on request!**

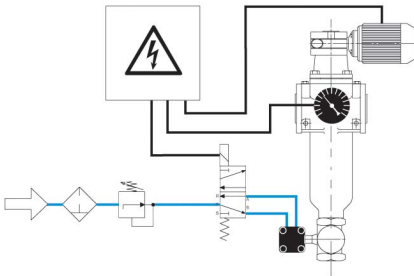
**Technical data is subject to change without notice**

## 4. Design and application

Cartridge type (see section 6)	Total surface in cm <sup>2</sup>	Gap width in $\mu\text{m}$ / effective filter surface in cm <sup>2</sup>														
		30	40	50	60	80	100	130	160	200	250	360	500	1000	1500	2000
AF 7013	230	14	18	22	26	33	40	50	59	69	81	102	121	162	182	194
AF 7033	230	14	18	22	26	33	40	50	59	69	81	102	121	162	182	194
AF 7073	230						22	28	33	40	49	64	81	121	146	162
AF 7083	230			15	18	23	29	36	43	51	61	79	97	139	162	177

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 s (about three turns of the filter cartridge). This suffices to clean the filter thoroughly. The motor may need to run continuously in exceptional cases. The drive shaft is always turned clockwise.

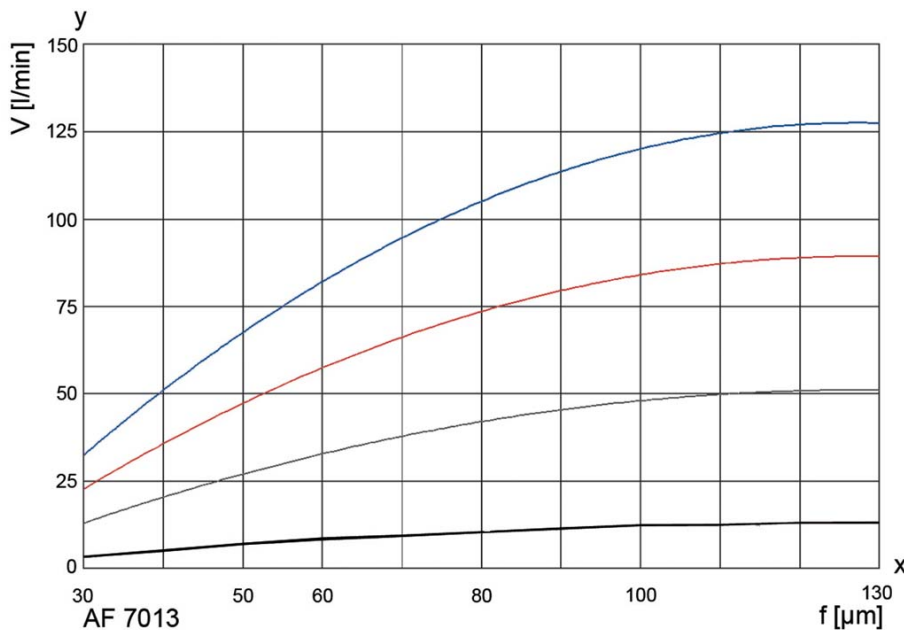
The drain valve is opened in order to empty the filter. Depending on the residue concentration, this can either take place synchronously with cleaning or be time or cycle controlled.

The opening time of the drain valve can be set between 2 and 6 s. 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 mm<sup>2</sup>/s

- 1 mm<sup>2</sup>/s
- 33 mm<sup>2</sup>/s
- 100 mm<sup>2</sup>/s
- 500 mm<sup>2</sup>/s

y = Volume flow V [l/min]

x = Gap width f [ $\mu\text{m}$ ]

## 6. Type number key

### Type number key with selection example for AF 7132-1691-60101 /H1

#### Size

AF 713 1 x 42x190 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

16 G1 1/4

#### Permissible operating pressure in bar (housing/cover)

9 PN 400

#### 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

#### Differential pressure indicator

- 6 PIS 3192, switching level at 2.2 bar, static 450 bar
- 7 PIS 3192, switching level at 5 bar, static 450 bar

#### Valves and control throttles for AF 11, 13, 15, 17

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
- 1 Bypass valve 20 bar

AF 713 2 - 16 9 1 -6 0 1 0 1 -XXXX (end number for special version) /H1

End number	Special version
3700	PTFE seals
Other numbers	On request

Type number key with selection example for coiled or welded cartridges for AF 70

Series						/E1
<b>AF 70</b>	Coiled or welded cartridge with triangular wire winding					
	<b>Material</b>	<b>Core element</b>	<b>Filter medium</b>	<b>Clamp rings</b>	<b>Wire width in mm</b>	
	<b>Coiled cartridge</b>					
	1	Al	1.4571	1.4571	0.5	
	3	1.4581	1.4571	-	0.5	
	<b>Welded cartridge</b>					
	7	-	1.4571	1.4571	1	
	8	-	1.4571	1.4571	0.75	
	<b>Overall length</b> Diameter x length in mm					
	3	42 x 190				
	<b>Gap width / rating in µm</b>					
	<b>003</b>	30 µm	<b>010</b>	100 µm	<b>036</b>	360 µm
	<b>004</b>	40 µm	<b>013</b>	130 µm	<b>050</b>	500 µm
	<b>005</b>	50 µm	<b>016</b>	160 µm	<b>100</b>	1000 µm
	<b>006</b>	60 µm	<b>020</b>	200 µm	<b>150</b>	1500 µm
	<b>008</b>	80 µm	<b>025</b>	250 µm	<b>200</b>	2000 µm
	Other filter ratings on request					
<b>AF 70</b>	<b>1</b>	<b>3</b>	<b>-010</b>			<b>/E1</b>

7. Spare parts

No.	Designation	Material no.	
		FPM/C steel	PTFE/VA
1	Bush kit		79797184
2	Seal kit (complete)	79797176	
3	Scraper		78389447
4	Filter cartridge	See name-plate	

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