

Automatic Metal Edge Filter

with a radial cleaning device and integrated cyclone effect

AF 93 G

casted version
for liquids

Connection size G 2, flange DN 50 and DN 65

1. Principle of operation

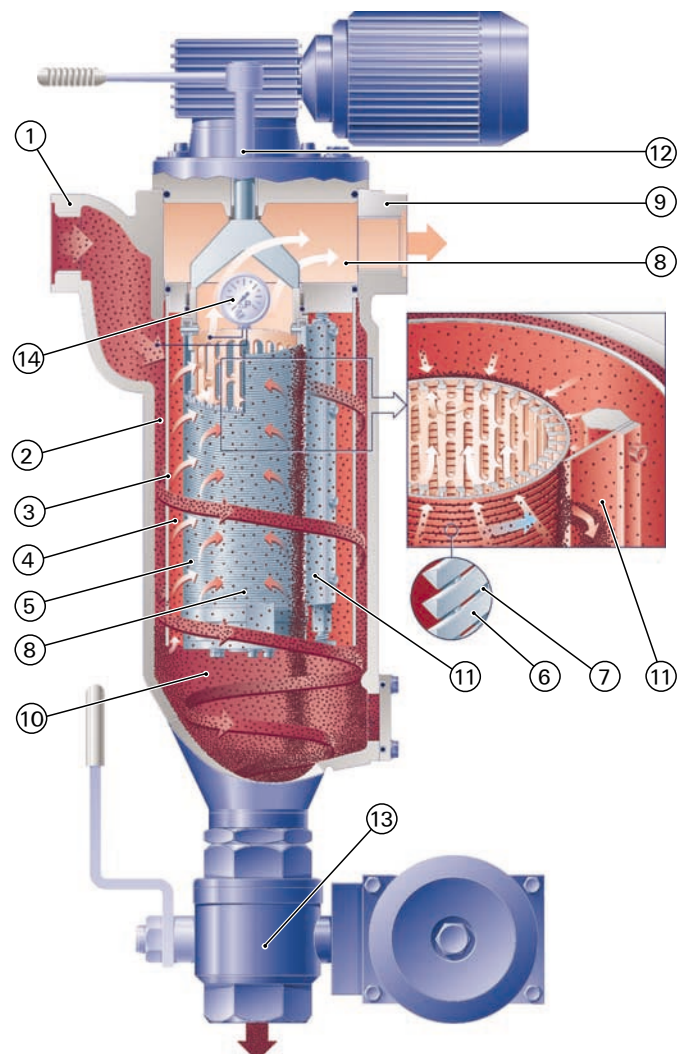
The **MAHLE metal edge filter system** and integrated cyclone effect is used for a wide range of low-viscosity liquids. This compact in-line pressure filter requires no maintenance and waste disposal measures such as used filter material. It can be cleaned fully or semi-automatically without having to interrupt operations.

The immersion pipe flows tangentially over the outer in-flow chamber, preventing the liquid from flowing directly to the filter cartridge and facilitating pre-separation and sedimentation in the collection cone due to the cyclone effect.

In the inner in-flow chamber, the liquid flows from the outside inwards through the **MAHLE filter cartridge**. The filtrate outlet is at the top, opposite the inlet. The defined separation of the residual solid matter, etc. takes place on the triangular profiled winding on the filter support tube.

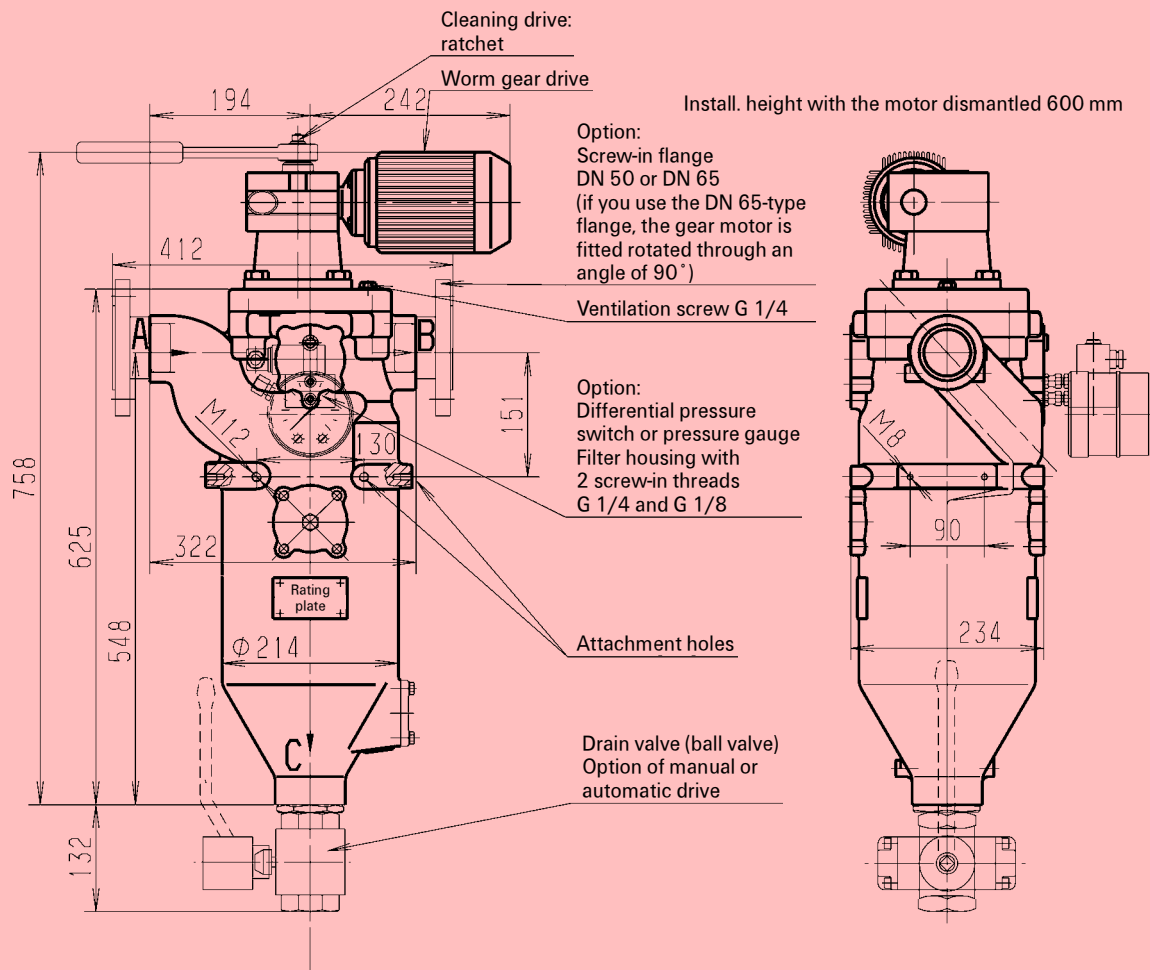
The MAHLE filter cartridge is cleaned by rotating against a scraper blade. The special shape of the metal-edge gaps serves to facilitate a very effective cleaning process. The **patented AKF system** prevents high axial forces, ensuring to run the cleaning process runs easily.

The residue deposited in the collection cone can then be emptied through the drain valve while the system is switched off or while it is in operation.



- | | |
|-------------------------------|--|
| 1 Inlet | 9 Outlet |
| 2 Outer in-flow chamber | 10 Residue collection cone |
| 3 Immersion pipe | 11 Scraper |
| 4 Inner in-flow chamber | 12 Cleaning drive with gear motor or manual ratchet |
| 5 MAHLE filter cartridge | 13 Drain valve automatic or manual |
| 6 Triangular profiled winding | 14 Differential pressure contact-manometer (required under certain conditions) |
| 7 Metal-edge gap | |
| 8 Filtrate chamber | |

2. Dimensions and data



Motor data

Worm gear motor
MB 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	17	1,1
λ 460 ± 10 %	60	0,22	17	0,7

Protection type: IP 55 insulation class F; output torque: 52 Nm

Worm gear motor with explosion protection
EExe II T4; output torque: 52 Nm

V	Hz	kW	rpm	A
Δ 230 ± 10 %	50	0,18	17	1,2
λ 400 ± 10 %	50	0,18	17	0,7

Dimensions	Contents	Weight	Cleaning
Type	(l)	(kg)	
AF93 . 2 -	12	73	Ratchet
AF93 . 3 -	12	82	Gear motor
AF93 . 4 -	12	82	Gear motor (expl.-prot.)

Standard design for liquid group 2 according pressure
equipment-directive 97/23/EU artikel 9

Filter data

Permissible operating pressure: 16, 25, 40, 63 bar
Permissible operating temperature: up to 40 bar max. 200 °C
up to 63 bar max. 100 °C

Sealing material at operating temperatures of up to 180 °C FPM (Viton)
200 °C PTFE base

Permissible differential pressure: Cartridge (welded) max. 40 bar,
cartridge (coiled) max. 10 bar

	Series	Available on request	
		with reduction	with a screw-in flange
A-B/In-flow drain conn.	G2	G1	DN50
C/Drain connection	G2	G1	G2

All screw-in holes, conforming to DIN 3582, X-type
DN 50 / DN 65 flanges conform to DIN 2527, up to 40, 63 bar

Standard materials: Housing and cover NCI 40
Installed parts st. 1.4301, NCI 40
Bearing bushes PTFE-based
FPM (Viton) seals

Cover lock: 4 x hexagon head screws, M20

Drive shaft seal: Stuffing box packing rings made from
PTFE yarn with disc spring pre-tensioning

Outer paintwork: Artificial resin primer,
blue according to RAL 5007

Other finishes available on request

Subject to technical modifications!

3. Type designation

Nomenclature table for filters without an element

Filter types used in specimen applications:

AF 936		3	-	13	2	5	-	4	0	2	0	0	/ G		1					
Size, quantity, Ø and length of the cartridge in mm		Cleaning drive		In-flow/discharge connections	Permissible operating pressure [bar] Housing/cover	Standard material with FPM seal + PTFE bearing		Differential pressure display/switch		Drain valve		Bypass valve	End no. for	Design variants	Type	Serial no.				
1 x Ø 110 x 265	2	Man. ratchet	13	G2	2	PN 16	1	Housing, cover, nodular cast iron 40, internal parts ch. steel or similar	1	PIS-3076/ 1,2 bar stat. 63 bar AI/FPM	Free	1	Manual ball valve	Free	1	20 bar	none	Standard filter	Cast iron finish	Continuous
	3	Stand. motor 220 – 240 V/ 380 – 415 V/ 50 Hz 243 – 277 V/ 420 – 480 V/ 60 Hz	14	Screw-in flange DN 50	3	PN 25			2	PIS-3076/ 0,7 bar stat. 63 bar AI/FPM		2	40 bar		3001	Standard filter insert, complete without housing and motor				
			15	Screw-in flange DN 65	5	PN 63	3	Housing, cover, NCI 40, internal parts high-grade steel 1.4301	3	delta-p contact manometer 0 – 6 bar		3	Automatic ball valve, electro-pneumatic, 230 V, double-action			3002	Standard filter insert, complete without ratchet or motor			
	4	Stand. motor Ex 230/400 V/ 50 Hz EExe II T4		Others available on request		Others available on request	4	Housing, cover, NCI 40, internal parts, ch. steel aluminium-free	4	delta-p contact manometer 0 – 1,6 bar		4	Automatic ball valve, electric, 24 V			3700	PTFE seals			
		Others available on request			5	Housing, cover, NCI 40, chemical nickel-plated internal parts high-grade steel 1.4301	5	delta-p contact-manometer with pressure transmitting flange 0 – 6 bar	5	Automatic ball valve, electric, 230 V			Others available on request							
					6	Housing, cover NCI 40 with anti corrosive protection, internal parts high-grade steel 1.4301	8	PIS-3076/ 2,2 bar stat. 63 bar AI/FPM												
						9	PIS-3076/ 5 bar stat. 63 bar AI/FPM													
						Others available on request		Others available on request												
						0	Different design, see end no.	0	Without or different design, see end no.	0		Without or different design, see end no.	0		Without or diff. design, see end no.					
		0	Different design, see end no.	0	Different design, see end no.	0	Different design, see end no.	0	Without or different design, see end no.	0		Without or different design, see end no.	0		Without or diff. design, see end no.					

Unless otherwise specified, the same or similar material and at least the permissible operating pressure apply for accessories.

The complete filter insert is built as standard with the highest pressure level. If the cleaning motor is used in explosion-protected design, the drain valve is also designed to be explosion-protected.

Nomenclature table for cartridges

Element types used in speciemem applications:

AF 60			7				6		-		010	
Series			Profile support material	Triangular profiled winding material	Supporting ring material	Triangular profile width in mm	Ø x length in mm		Gap in µm			
AF 60	Cartridge (coiled)	1	Al	1.4571	1.4571	0,5	6	Ø 110 x 265	003	30		
		2	Al	1.4571	1.4571	0,8			004	40		
		3	1.4581	1.4571	–	0,5			005	50		
		4	1.4581	1.4571	–	0,8			006	60		
	Cartridge (welded)	6	–	1.4571	1.4571	1,5 – 1,8			008	80		
		7	–	1.4571	1.4571	1,0			010	100		
									013	130		
									016	160		
									020	200		
									025	250		
									036	360		
									050	500		
100	1000											
150	1500											
200	2000											
								Others available on request				

4. Accessories

Cartridge types	Total area of the filter in cm ²	Cartridge in µm / Effective filtering surface in cm ²														
		30	40	50	60	80	100	130	160	200	250	360	500	1000	1500	2000
AF 6016-...	881,3	49,9	65,3	80,1	94,4	121,6	146,9	181,9	213,7							
AF 6026-...	881,3			51,8	61,5	80,1	97,9	123,2	146,9	176,3	209,8	273,5	339,0	489,6	574,8	629,5
AF 6036-...	836,4	47,3	62,0	76,0	89,6	115,4	139,4	172,6	202,8							
AF 6046-...	836,4			49,2	58,4	76,0	92,9	116,9	139,4	167,3	199,1	259,6	321,7	464,7	545,5	597,4
AF 6076-...	836,4			39,8	47,3	62,0	76,0	96,2	115,4	139,4	167,3	221,4	278,8			
AF 6066-...	836,4									83,6	102,0	139,4	181,8	298,7	380,2	440,2

Working pressure [bar]	Viscosity [mm ² /s]	Recommended initial differential pressure (Δp)
> approx. 2 – < approx. 25	< approx. 1000	≤ approx. 0,3 – 0,6 bar
	> approx. 1000	≥ approx. 0,6 – 1,0 bar
> approx. 25 – 100	< approx. 1000	≤ approx. 0,6 – 1,0 bar
	> approx. 1000	≥ approx. 1,0 – 1,5 bar
< approx. 2 and suction-action	< approx. 1000	≤ approx. 0,05 – 0,1 bar

Recommended designs

Cleaning/motor start once Δp = 1,2 bar has been reached
 Cleaning time/motor running time is set to 10 s (≈ approx. 3 rpm)
 Initial differential pressure after cleaning 0,3 bar
 Drain valve is set to be emptied every 30 minutes
 Drainage or opening time of the drain valve is set to 3 seconds

Specimen application:

Filter type: AF 9363-1325-40200/G1

Reel type: AF 6076-010

Liquid being filtered:

Viscosity: 1 mm²/s

Particles/matter to separate off:

Volumetric flow: 42000 l/h

Working pressure:

Gap width: 100 µm

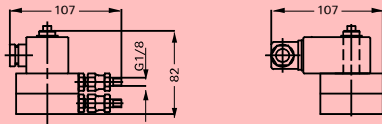
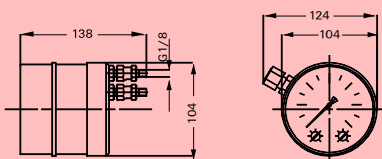
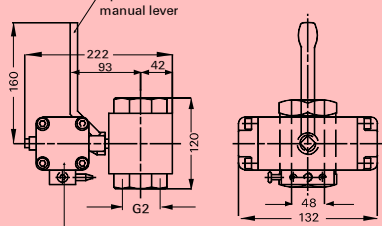
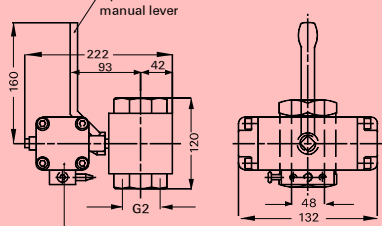
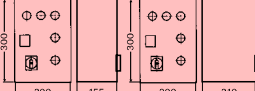
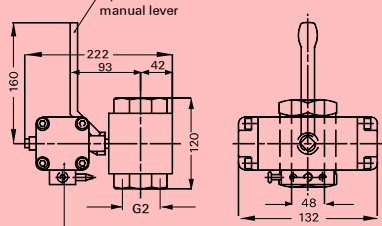
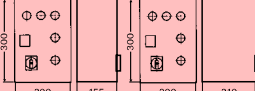
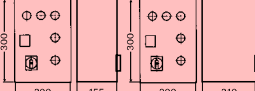
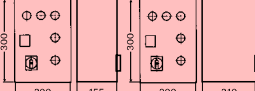
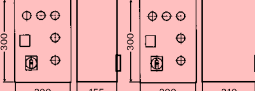
Filter equipment for fully automatic cleaning operation using a drive motor, differential pressure switch and drain valve. The on-site controller is integrated into the system.

Evaluation criteria for safe cleaning and filtration

The nature, condition, size, characteristics and concentration of the particles/matter etc., as well as other properties of the liquid or paste.

Our specialists would be pleased to assist you for finding the proper solution for your application. If you do not have any reliable evaluation criteria to hand, principle trials can also be performed using test filters.

5. Design / Specimen application

	Description/Data	Display and switching press.	Application criteria	Figure/Dimensions
Differential pressure indicator / Switch *)	Mounting kit for a differential pressure indicator PIS-3076 with an optical display and electric contact	0,7 bar	up to approx. 1000 mm ² / s	
	Permissible static operating pressure: 63 bar	1,2 bar		
	Permissible operating temp.: -10 bis +120 °C	2,2 bar		
	Mater. for parts contacting product: AL/FPM	5,0 bar		
Differential pressure indicator / Switch *)	Electrical data:		up to approx. 500 mm ² / s	
	Type of contact: Make/break contacts	0 -1,6 bar		
	Max. voltage: 230 V, AC/DC	0 - 6 bar		
	Max. switched current: 2,5 A			
Drain valve	Max. switching capacity: 60VA/40W		up to approx. 500 mm ² / s	
	Contact current closing rating: 70 VA			
	Degree of protection: IP 65			
	Cable guide: PG 11 Ø6 - 10			
Drain valve	Mounting kit for a differential pressure gauge with an adjustable contact		up to approx. 500 mm ² / s	
	Perm. static operating pressure: 25 bar, high-grade steel 40 bar			
	Perm. operating temperature: 70 °C			
	Mater. for parts contacting product in acc. with the filter (Type key)			
Controller	Adjustable micro switch with a 1-pin changeover contact		up to approx. 500 mm ² / s	
	Max. switching capacity: 5 A/250 V AC			
	0,4 A/ 30 V DC			
	Degree of protection: IP 54			
Drain valve	Connection: G 2		up to approx. 500 mm ² / s	
	Operating pressure: 40 bar			
	Permissible operating temperature: 120 °C			
	Housing material: nickel-plated MS			
Controller	Ball material: hard chrome-plated MS		up to approx. 500 mm ² / s	
	Ball seal material: PTFE			
	Spindle seal: FPM (Viton)			
	Swivel drive: Pneumatic double piston			
Controller	Control pressure: 6 - 8 bar		up to approx. 500 mm ² / s	
	Compressed air connection: G 1/4 (DN 8)			
	El. pilot control voltage: 24 V DC/optional explosion protection or 230 V AC/optional explosion protection			
	Power consumption: 2,5 Watt at 24 V DC or 4,5 VA at 230 V AC			
Controller	Degree of protection: IP 65 DIN 40050		up to approx. 500 mm ² / s	
	Control function: Closed without current			
	MAHLE switchgear cabinet with a SIEMENS logo			
	User-programmable controller for different operating conditions			
Controller	Input voltage: 3/PE/N AC 400/230 V		up to approx. 500 mm ² / s	
	Control voltage: 24 V DC or 230 V AC			
	Degree of protection: IP 65			
	Optional: Filter within the controller, outside the explosion range			

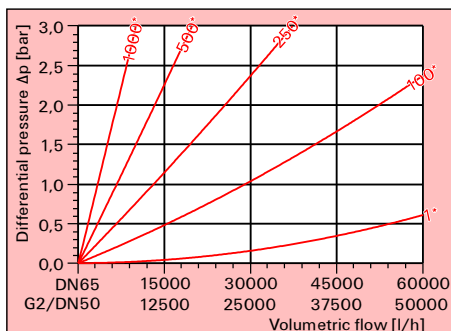
*) Cleaning can take place at timed intervals or in cycles.

Other designs available on request
 Subject to technical modifications

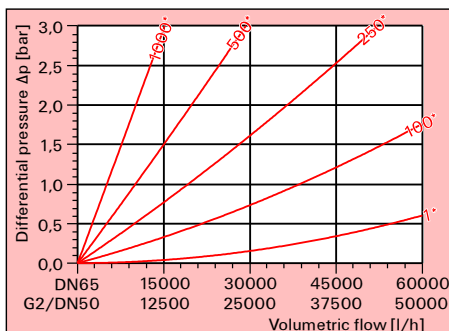
6. Differential pressure characteristics

*) Viscosity
in mm²/s

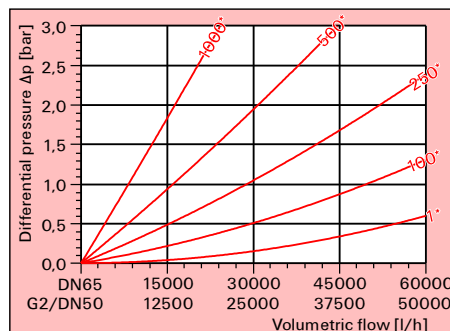
Standard values for pure liquids



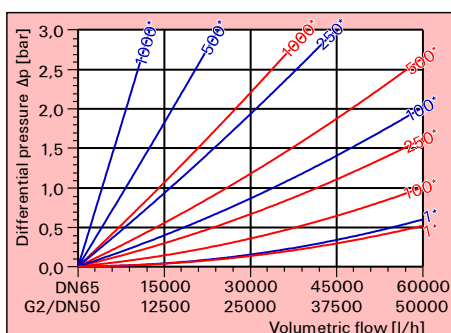
30 μm with AF 6016-003 and AF 6036-003



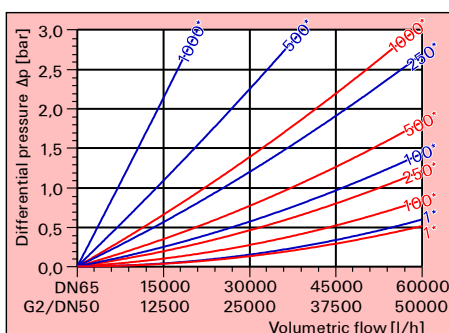
40 μm with AF 6016-004 and AF 6036-004



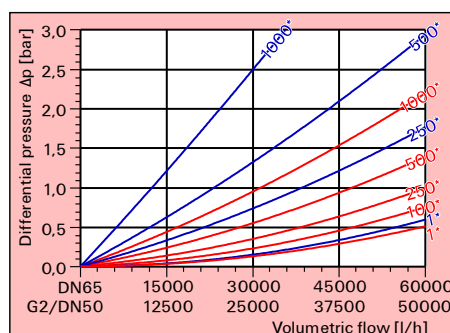
50 μm with AF 6016-005 and AF 6036-005



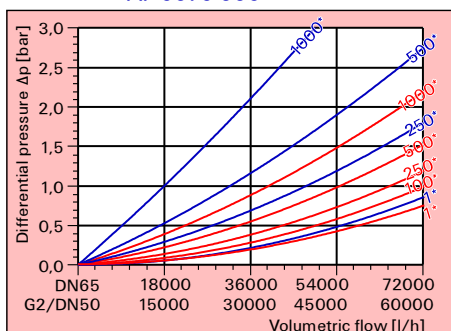
60 μm with AF 6016-006, AF 6036-006,
AF 6076-006



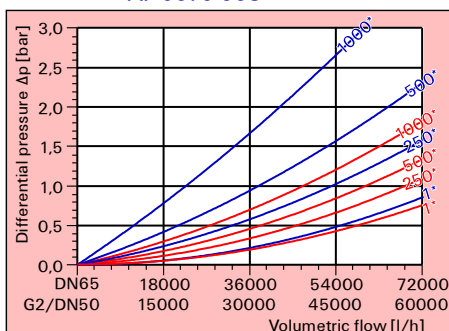
80 μm with AF 6016-008, AF 6036-008,
AF 6076-008



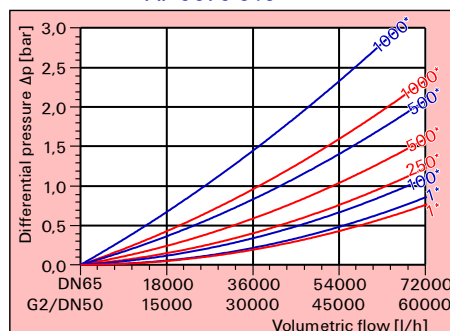
100 μm with AF 6016-010, AF 6036-010,
AF 6076-010



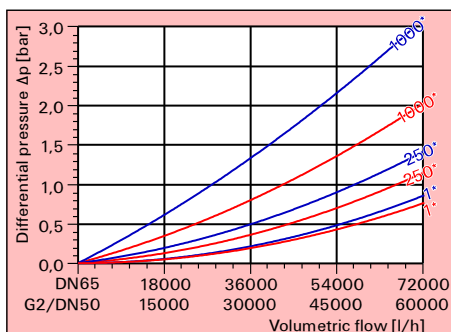
130 μm with AF 6016-013, AF 6036-013,
AF 6076-013



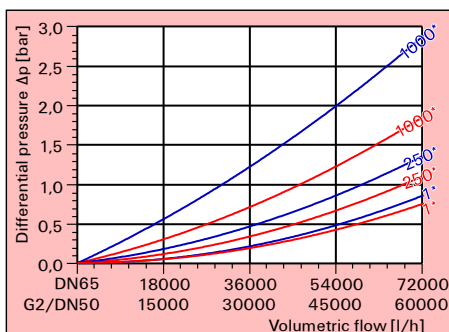
160 μm with AF 6016-016, AF 6036-016,
AF 6076-016



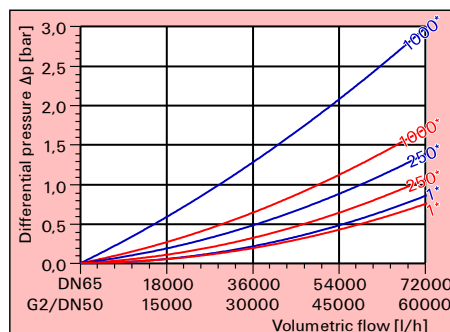
200 μm with AF 6026-020, AF 6046-020,
AF 6076-020



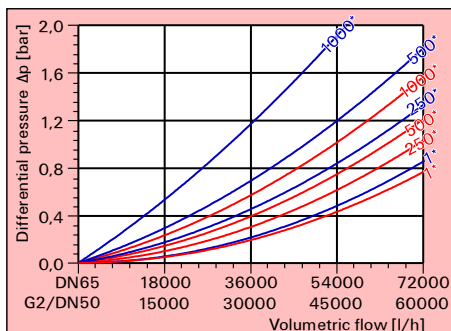
250 μm with AF 6026-025, AF 6046-025,
AF 6076-025



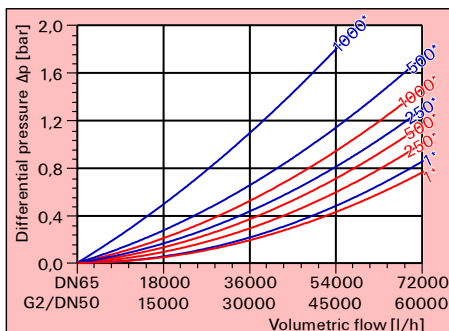
360 μm with AF 6026-036, AF 6046-036
AF 6076-036



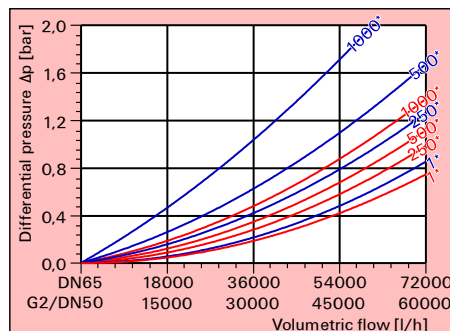
500 μm with AF 6026-050, AF 6046-050
AF 6066-050



1000 μm with AF 6026-100, AF 6046-100
AF 6066-100

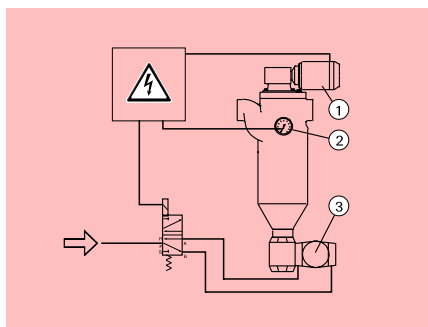


1500 μm with AF 6026-150, AF 6046-150,
AF 6066-150



2000 μm with AF 6026-200, AF 6046-200,
AF 6066-200

7. Operating modes for cleaning and emptying



Fully automatic operation

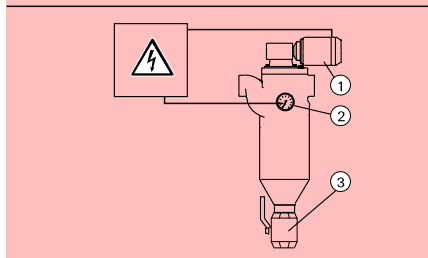
The drive motor ① can be cleaned or set into operation by means of time, cycle or differential pressure control via switch or pressure gauge contacts ②. We recommend that cleaning take place at about four times the initial Δp . The motor can also run permanently at short filtration phases (rotating the drive shaft clockwise).

Cleaning time/engine running time 10 s ($\approx$ approx. 3 rpm).

Depending on the residue concentration, the drain valve ③ can be opened for drainage purposes synchronously with the start of the cleaning process or by means of time or cycle control.

The emptying or opening time of the drain valve is set at between 3 and 6 seconds.

In suction applications, it can be opened by means of an intermediate buffer or if the volumetric flow is interrupted.

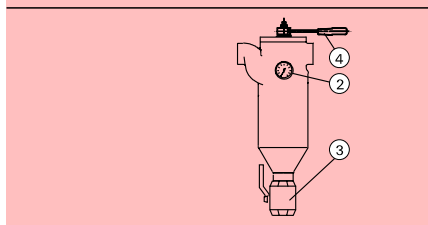


Semi-automatic operation

The details described above apply for the cleaning/operation of the drive motor.

If the concentration of particles, solid matter or agglomerates is low, it can be emptied manually via the drain valve ③, e.g. at the end of a batch, while the system is idle or on a time-controlled basis.

The details described above apply for the emptying or opening time.



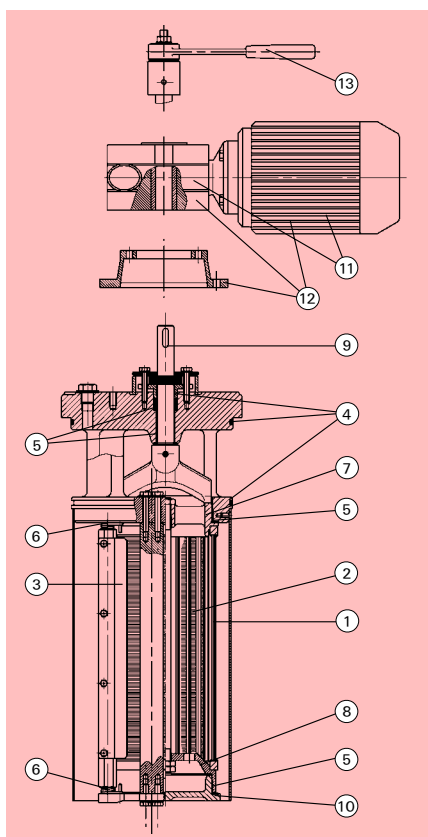
Operation with a manual ratchet

It can also be cleaned manually with a ratchet ④ during short filtration phases or if the concentration of particles, solid matter or agglomerates is low. This requires 2 complete clockwise rotations.

The details described above for semi-automatic operation apply for the emptying or opening time.

The filter is supplied complete with a detailed description taken from the operating manual.

8. Spare parts and add-on kits



NR.	Description	Types
1	Filter insert, fully assembled (1 - 10), comprising a cover with a drive shaft and scraper and cartridge. Optionally also available with a drive motor 12 or ratchet 13	Is defined with reference to the full name of the filter or, where necessary, using the type key. Selected example: AF 7360-051-00000-3001/G, AF 6016-010
2	Cartridge with a triangular profiled winding 1.4571 wound on an Al profile support	Selected example from the type key or filter area table: AF 6016-005 (50 μ m) AF 6026-020 (200 μ m)
	Cartridge with a triangular profiled winding 1.4571 borne on a high-grade steel profile supp. 1.4581	AF 6034-005 (50 μ m)
	Cartridge, made fully from 1.4571 with a profiled winding welded onto support rods	AF 6084-008 (80 μ m) AF 6074-025 (250 μ m) AF 6064-100 (1000 μ m)
3	High-grade steel stripper 1.4310	975 352 6
4	FPM (Viton) sealing kit	936 034 8
	VMQ/FEP (PTFE-based) sealing kit	970 957 7
5	PTFE-based bearing bush kit	938 310 0
6	High-grade steel leg spring kit 1.4310	975 349 2
7	Driver ring/C-steel	975 353 4
	Driver ring/high-grade steel 1.4301	975 354 2
8	Bottom cartridge ring/C-steel	975 355 9
	Bottom cartridge ring/high-grade steel 1.4301	975 356 7
9	Drive shaft 1.4301, complete with a NCI driver fork Drive shaft cpl. with a driver fork 1.4301	975 357 5 975 358 3
10	Centring flange/NCI 40	975 359 1
	Centring flange/high-grade steel 1.4301	975 360 9
11	Drive motor (with gears) Motor data, see 5. Dimensions and data	930 242 3
	Drive motor, explosion protection (with gears) Motor data, see 5. Dimensions and data	939 832 2
12	Motor add-on kit (with gears and a motor frame) Motor data, see 5. Dimensions and data	970 831 4
	Motor add-on kit, Ex-proof (with gears and a motor frame) Motor data, see 5. Dimensions and data	975 348 4

Subject to technical modifications



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