



Automatic Metal Edge Filter

with radial cleaning device

Pi 72 G

casted version
 for liquids, pastes and similar
 media Connection size G 1 1/2, flange DN 40

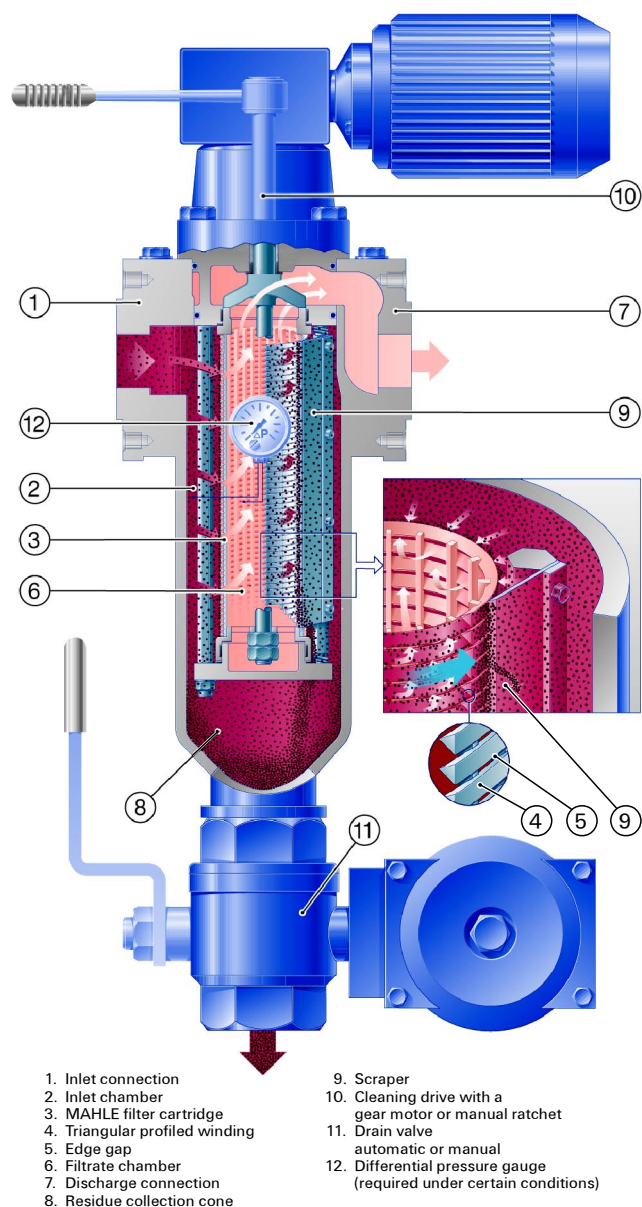
1. Principle of operation

The **MAHLE metal edge filter system** is used for filtering and homogenising a wide range of liquids, wastes and such like. This compact in-line pressure filter requires no maintenance, nor is there any need to dispose of the auxiliary filter media. It can be cleaned automatically or semi-automatically without having to interrupt operations.

The liquid flows from the outside inwards through the **MAHLE filter element**. The filtrate is discharged, opposite the inlet connection. Solid matter, etc. is separated on the triangular profiled winding on the filter support tube.

The MAHLE filter element is cleaned by rotating it against a scraper blade. The special shape of the edge gaps serves to facilitate a very effective cleaning process. The **patented AKF system** prevents high axial forces, ensuring that the cleaning process is trouble free.

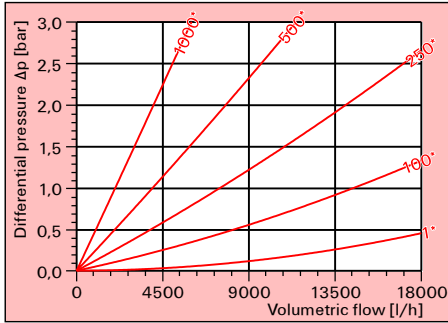
The residue deposited in the collection cone can then be emptied through the drain valve while the system is switched off or while it is in operation.



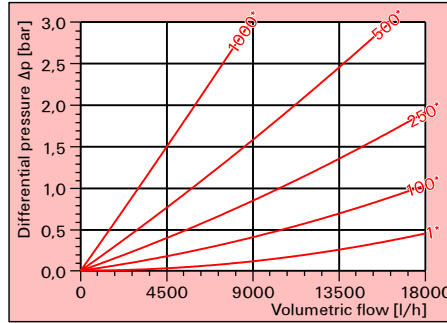
Differential pressure characteristics

*) Viscosity
in mm²/s

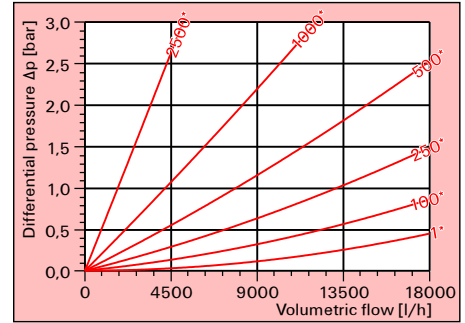
Standard values for pure liquids, pastes and similar media with Newtonian flow properties



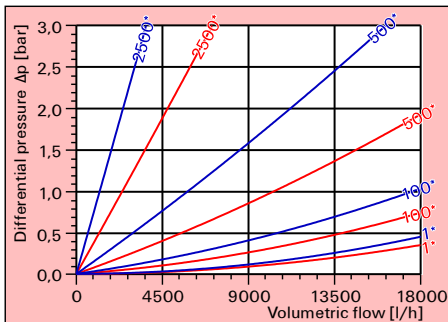
30 µm with Pi 6014-003 and Pi 6034-003



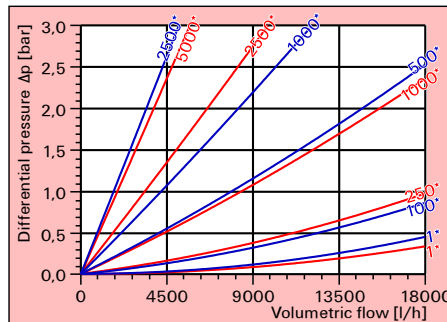
40 µm with Pi 6014-004 and Pi 6034-004



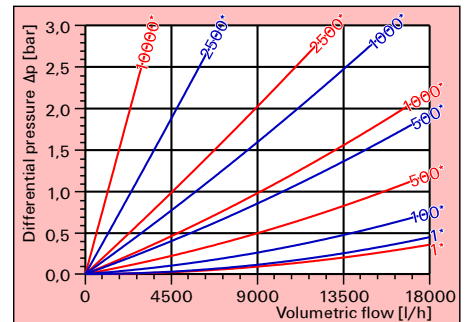
50 µm with Pi 6014-005 and Pi 6034-005



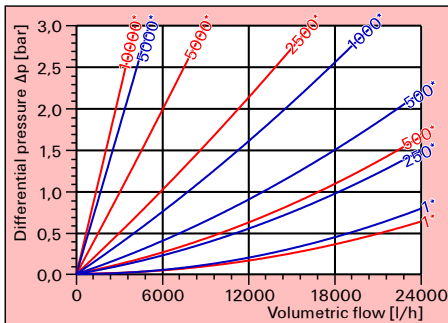
60 µm with Pi 6014-006, Pi 6034-006,
Pi 6044-006 and Pi 6084-006



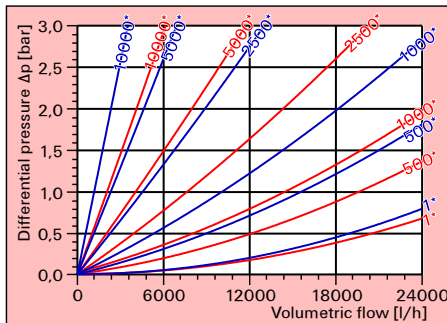
80 µm with Pi 6014-008, Pi 6034-008,
Pi 6044-008 and Pi 6084-008



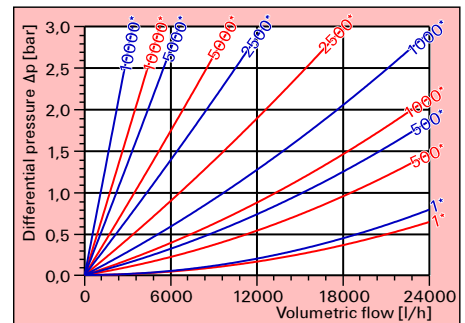
100 µm with Pi 6014-010, Pi 6034-010,
Pi 6044-010 and Pi 6084-010



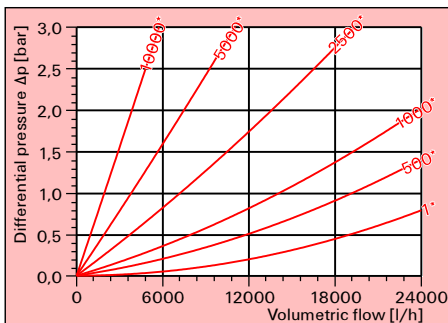
130 µm with Pi 6014-013, Pi 6034-013,
Pi 6044-013 and Pi 6084-013



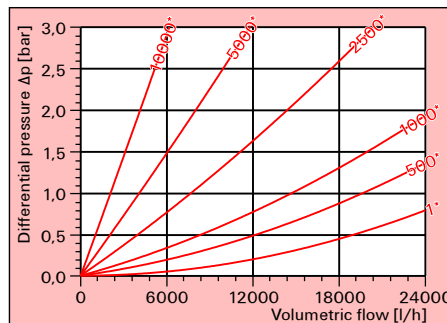
160 µm with Pi 6014-016, Pi 6034-016,
Pi 6044-016 and Pi 6084-016



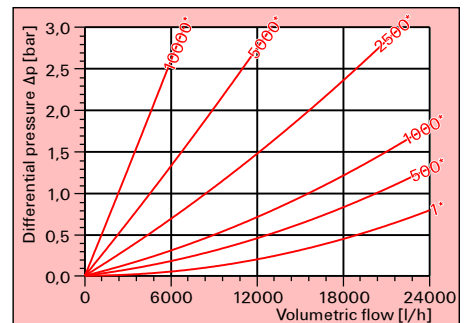
200 µm with Pi 6024-020, Pi 6044-020,
Pi 6074-020



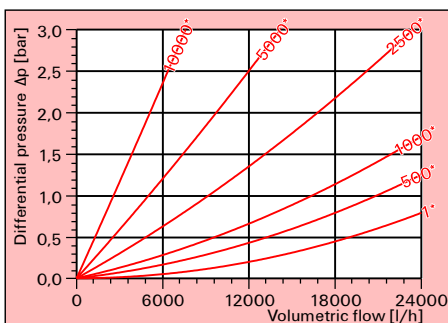
250 µm with Pi 6024-025, Pi 6044-025,
Pi 6074-025



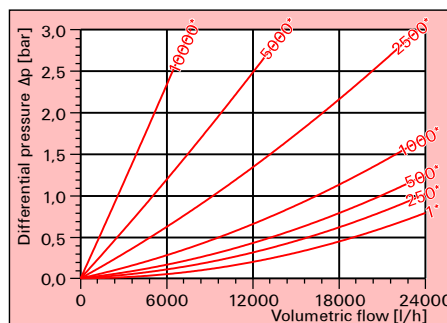
360 µm with Pi 6024-036, Pi 6044-036
Pi 6074-036



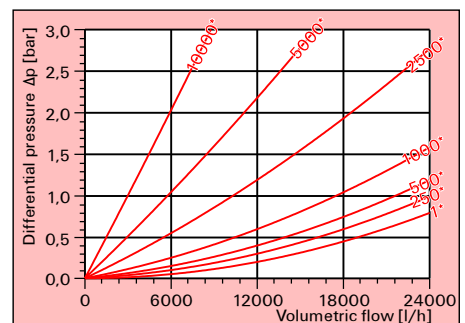
500 µm with Pi 6024-050, Pi 6044-050
Pi 6064-050



1000 µm with Pi 6024-100, Pi 6044-100
Pi 6064-100



1500 µm with Pi 6024-150, Pi 6044-150,
Pi 6064-150



2000 µm with Pi 6024-200, Pi 6044-200,
Pi 6064-200

3. Nomenclature table

Nomenclature table for filters without an element

Filter types used in specimen applications:

Pi 724		3	-	2	2	1	-	1	0	2	0	0	/ G 4									
Size, quantity, Ø and length of the cartridge in mm		Cleaning drive		Inlet/ outlet connections		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 65 x 230	2	Man. ratchet	2	Flange DN 40 with a screw-in thread G1 ½	2	PN 16	1	Housing, cover, cast iron 40, internal parts st. 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 G	Continuous		
	3	Stand. motor 230/400 V/50 Hz 266/460 V/50 Hz	4		PN 40	4	PN 40	2	PIS 3076/ 0,7 bar/ stat. 63 bar AI/FPM	2		delta-p pressure gauge 0-6 bar	2		Automatic ball valve, electro-pneumatic, 24 V, double-action	2	40 bar	Others available on request			3001	Standard filter insert, complete without a housing and motor
	4	Stand. motor Ex 230/400 V/50 Hz EExe II T4	6		Others available on request	3	Housing, cover, NCI 40, internal parts high-grade steel 1.4301	3	delta-p pressure gauge 0-6 bar	3		Automatic ball valve, electro-pneumatic, 230 V, double-action	3		Automatic ball valve, electric, 24 V	3002	Standard filter insert, complete without a ratchet or a motor					
		Others available on request			4	Housing, cover, NCI 40, internal parts, ch. steel aluminium-free	4	delta-p pressure gauge 0-1,6 bar	4	Automatic ball valve, electric, 24 V		4	Automatic ball valve, electric, 230 V		3700	PTFE seals						
						5	Housing, cover, NCI 40, chemical nickel-plated internal parts high-grade steel 1.4301	6	PIS-3192/ 2,2 bar/ stat. 450 bar	5		Automatic ball valve, electric, 230 V			Others available on request							
						6	Housing NCI 40 with a Halar coating, cover and internal parts high-grade steel 1.4301	7	PIS-3192/ 5 bar stat. 450 bar	6		Without or different design, see end no.										
							Others available on request	8	PIS-3076 2,2 bar stat. 63 bar AI/FPM	7		Without or different design, see end no.										
								9	PIS-3076 5 bar stat. 63 bar AI/FPM	8		Without or different design, see end no.										
								0	Without or different design, see end no.	9		Without or different design, see end no.										
								0	Without or different design, see end no.	0		Without or different design, see end no.										
								0	Without or different design, see end no.	0		Without or different design, see end no.										
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								0	Without or different design, see end no.	0		Without or different 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 explosion-proof, the drain valve will also be supplied explosion-proof.

Nomenclature table

Cartridges used in specimen applications:

Pi 60		1					4		-		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		
Pi 60	Cartridge (coiled)	1	Al	1.4571	1.4571	0,5	4	Ø 65 x 230	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		
		8	–	1.4571	1.4571	0,75			013	130		
									016	160		
									020	200		
									025	250		
									036	360		
									050	500		
									100	1000		
									150	1500		
									200	2000		
									Others available on request			

4. Design / Specimen application

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
Pi 6014-...	449,3	25,4	33,3	40,8	48,1	62,0	74,9	92,7	108,9							
Pi 6024-...	449,3			26,4	31,3	40,8	49,9	62,8	74,9	89,9	107,0	139,4	172,8	249,6	293,0	320,9
Pi 6034-...	408,5	23,1	30,3	37,1	43,8	56,3	68,1	84,3	99,0							
Pi 6044-...	408,5			24,0	28,5	37,1	45,4	57,1	68,1	81,7	97,3	126,8	157,1	226,9	266,4	291,8
Pi 6084-...	408,5			25,5	30,3	39,4	48,1	60,3	71,8							
Pi 6074-...	408,5			19,5	23,1	30,3	37,1	47,0	56,3	68,1	81,7	108,1	136,2			
Pi 6064-...	408,5									40,8	49,8	68,1	88,8	145,9	185,7	215,0

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

Recommended designs

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

Specimen application:

Filter type: Pi 7243-221-10200/G4

Element type: Pi 6014-010

Liquid being filtered: Heavy oil (mineral)
 Viscosity at operating temperature: 380 mm²/s at 40 °C
 Particles/matter to separated: Cinders, pipe rust, etc.
 Volumetric flow: 9000 l/h
 Working pressure: 5 bar
 Gap width: 100 µm

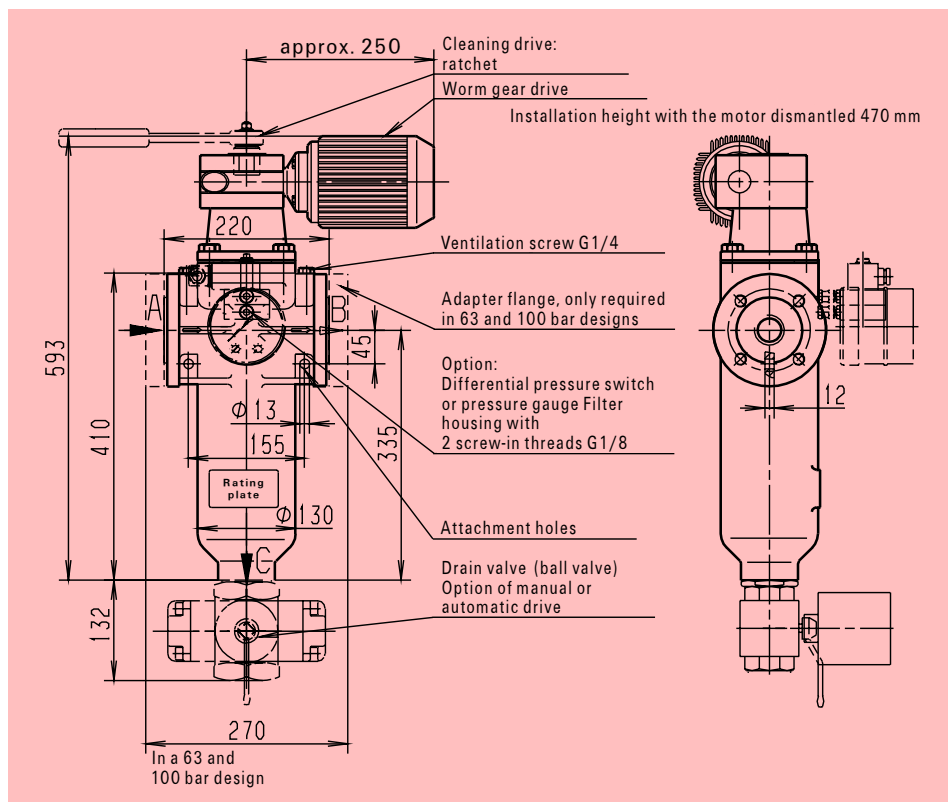
Filter equipment for fully automatic cleaning operation using a drive motor, differential pressure switch and drain valve. The on-site controller is integrated into the system.

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 consultants will be happy to tell you about this and the different design variants. If you do not have any reliable evaluation criteria available, pilot trials can also be performed using test filters.

5. Dimensions and data



Motor data

Worm gear motor

Δ 230 V ± 10 % 50 Hz 0,18 kW 1,20 A
 Λ 400 V ± 10 % 50 Hz 0,18 kW 0,70 A
 Δ 266 V ± 10 % 60 Hz 0,22 kW 1,20 A
 Λ 460 V ± 10 % 60 Hz 0,22 kW 0,70 A

Degree of protection: IP 55, ISO class F

Output speed: 17,1 rpm 50 Hz
 21,0 rpm 60 Hz

Output torque: 52 Nm

Worm gear motor

with explosion protection

Δ 230 V ± 10 % 50 Hz 0,18 kW 1,0 A
 Λ 400 V ± 10 % 50 Hz 0,18 kW 0,57 A

EExe II T4

Output speed: 16,9 rpm

Output torque: 52 Nm

Other designs available on request
 Subject to technical modifications!

Filter data

Operating pressure: 16, 25, 40, 63, 100 bar
 Operating temperature: up to 63 bar max. 200 °C / 100 bar max. 100 °C
 Sealing material at operating temperatures of up to 180 °C FPM (Viton), up to 200 °C PTFE base
 Differential press. resistance: Cartridge (welded) max. 40 bar, cartridge (coiled) max. 10 bar
 A-B / Inlet/outlet connection: Threaded hole, G1 1/2 DIN 3852 Y-type, Flange DN 40 DIN 2527 max. 40 bar, 63 bar, 100 bar

C/Drain connection: Threaded hole G2 DIN 3852 X-type

Materials: See 3. Nomenclature table

Cover lock: 4x hexagon head screws, M16

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

Volume/weight: 4 l/42 kg with a ratchet and max. access.
 4 l/52 kg with a motor and max. access.

Outer paintwork: Artific. resin primer, blue conf. to RAL 5007

6. Accessories

	Description/Data	Display and switching press.	Application criteria	Figure/Dimensions
Differential pressure display / Switch *)	Mounting kit for a differential pressure switch PIS 3076 with an optical display and electric contact Permissible static operating pressure 63 bar Permissible operating temp. -10 to +120 °C Mater. for parts contacting product AL/FPM Electrical data Type of contact Make/break contacts Max. voltage 230 V, AC/DC Max. switched current 2,5 A Max. switching capacity 60VA/40W Contact current closing rating 70 VA Degree of protection IP 65 Cable guide PG 11 Ø 6 - 10	0,7 bar	up to approx. 1000 mm ² /s ¹)	
		1,2 bar		
		2,2 bar		
Differential pressure display / Switch *)	Mounting kit for a differential pressure gauge with an adjustable contact Permissible static 25 bar, high-grade steel 40 bar Permissible operating temperature 70 °C Mater. for parts contacting product in acc. with the filter (Nomenclature table) Adj. micro switch with a 1 pin changeover contact Max. switching capacity 5 A/250 V AC 0,4 A/ 30 V DC Degree of protection IP 54	0 – 1,6 bar	up to approx. 500 mm ² /s ¹)	
		0 – 6 bar		
Differential pressure display / Switch *)	Mounting kit for an opto-electronic differential pressure switch PIS-3192 with an electric contact and mounted block Permissible static operating pressure 450 bar Permissible operating temp. -10 to +120 °C Mater. for parts contacting product 1.4301/FPM Electric data, as above, PIS-3076	2,2 bar	up to approx. 500 mm ² /s ¹)	
		5,0 bar		
Drain valve	Mounting kit for a drain valve (ball valve) with an electro-pneumatic swivel drive or hand lever Connection G 2 Operating pressure 40 bar Permissible operating temperature 120 °C Housing material nickel-plated MS Ball material hard chrome-plated MS Ball seal material PTFE Spindle seal FPM (Viton) Swivel drive Pneumatic double piston Control pressure 6 – 8 bar Compressed air connection G 1/4 (DN 8) Electric pilot control voltage 24 V DC/optional expl. protection 230 V AC/optional expl. protection Power consumption 2,5 W at 24 V DC 4,5 VA at 230 V AC Degree of protection: IP 65 DIN 40050 Control function: Closed without current			
Controller	MAHLE switchgear cabinet with a SIEMENS logo User-programmable controller for different operating conditions Input voltage 3/PE/N AC 400/230 V Control voltage 24 V DC or 230 V AC Degree of protection IP 65 Optional Filter within the controller, outside the explosion range			

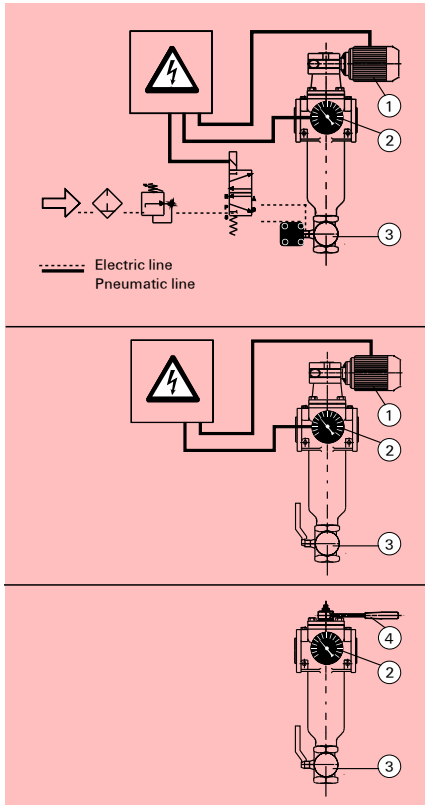
Other designs available on request

Subject to technical modifications

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

1) A differential pressure gauge with a pressure centring flange is used at higher viscosities

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/motor running time 10 s ($\approx$ approx. 3 revolutions).

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.

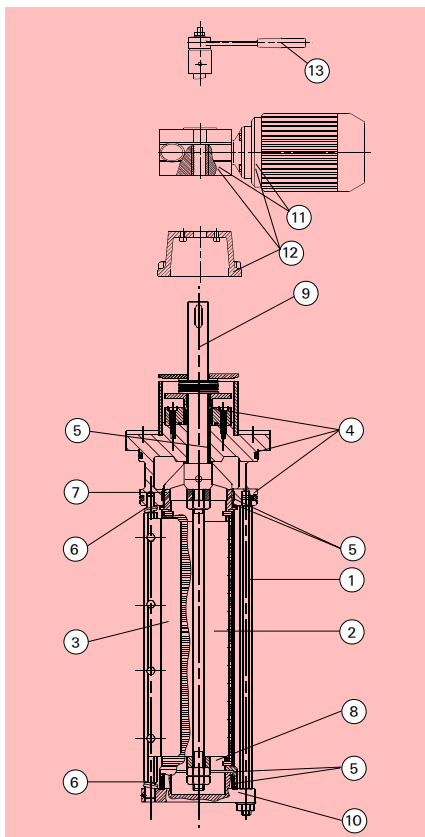
Operation with a manual ratchet

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 reel with a scraper. 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 nomenclature table. Selected example: Pi 7240-061-00000-3001/G, Pi 6014-010
2	Cartridge with a triangular profiled winding 1.4571 borne on an Al profile support	Selected example from the nomenclature table or filter area table: Pi 6014-005 (50 μ m), Pi 6024-020 (200 μ m)
	Cartridge with a triangular profiled winding 1.4571 borne on a high-grade steel profile support 1.4581	Pi 6034-005 (50 μ m)
	Cartridge, made fully from 1.4571, with a profiled winding welded onto support rods	Pi 6084-008 (80 μ m) Pi 6074-025 (250 μ m) Pi 6064-100 (1000 μ m)
3	High-grade steel scraper 1.4310	971 850 3
4	FPM (Viton) sealing kit	933 178 6
	VMQ/FEP (PTFE-based) sealing kit	971 851 1
5	PTFE-based bearing bush kit	971 849 5
6	High-grade steel leaf spring kit 1.4310	971 852 9
7	Driver ring/C-steel	977 620 4
	Driver ring/high-grade steel 1.4571	977 621 2
8	Bottom cartridge ring/C-steel	971 799 2
	Bottom cartridge ring/high-grade steel 1.4571	971 798 4
9	Drive shaft 1.4301 complete with a NCI driver fork NCI	971 797 6
	Drive shaft cpl. with a driver fork 1.4301	975 361 7
10	Centring flange/NCI 40	971 795 0
	Centring flange/high-grade steel 1.4571	971 796 8
11	Drive motor (with gears) Motor data, see 5. Dimensions and data	971 791 9
	Drive motor, explosion protection (with gears) Motor data, see 5. Dimensions and data	971 794 3
12	Motor add-on kit (with gears and a motor frame) Motor data, see 5. Dimensions and data	971 792 7
	Motor add-on kit, Ex-proof (with gears and a motor frame) Motor data, see 5. Dimensions and data	971 793 5

Subject to technical modifications



MAHLE Filtersysteme GmbH

Bereich Industriefilter

Schleifbachweg 45 · D-74613 Öhringen

Postfach 13 09 · D-74603 Öhringen

Telefon (0 79 41) 67-0 · Telefax (0 79 41) 67-429

Internet: <http://www.mahle.com> · E-mail: ub2_industrie@mahle.com