

FMP 039



Maximum pressure 110 bar
Flow rates to 80 l/min



Technical data

Filter housing (Materials)

- Head: Anodized aluminium
- Housing: Anodized aluminium
- Bypass valve: Steel

Pressure

- Working pressure: 110 bar (11 MPa)
- Test pressure: 170 bar (17 MPa)
- Burst pressure: 330 bar (33 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 110 bar (11 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar \pm 10%
- Other opening pressures on request.

Δp Elements type

- Microfibre filter elements series N: 20 bar
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

Seals

- Standard NBR series A
- Optional FPM series V

FMP 039 FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	2	3	4
• FMP 039	0,60	0,70	0,80

Volumes (dm³)

Length	2	3	4
• FMP 039	0,19	0,26	0,34

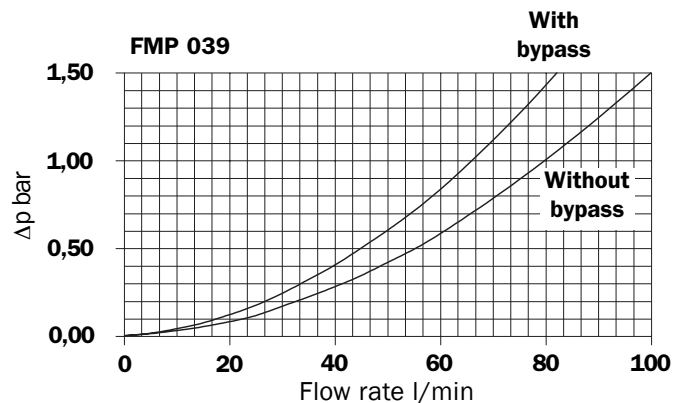
Connections

- FMP 039: In-line Inlet/Outlet

Filter housings Δp pressure drop

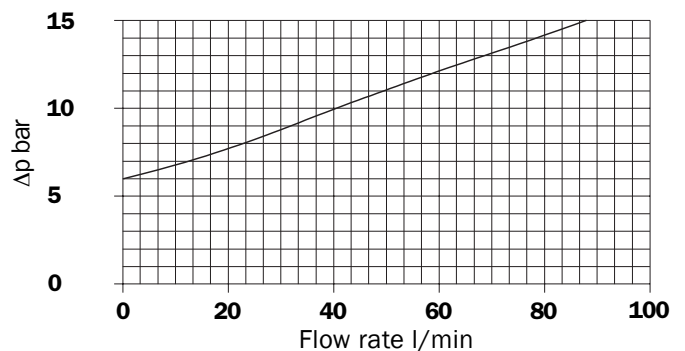
The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

Δp varies proportionally with density.



Valves

Bypass valve pressure drop



Recommended maximum flow rate

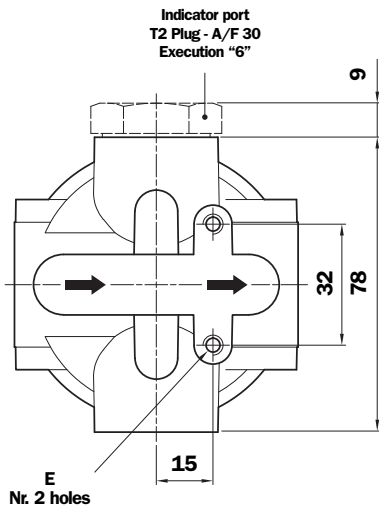
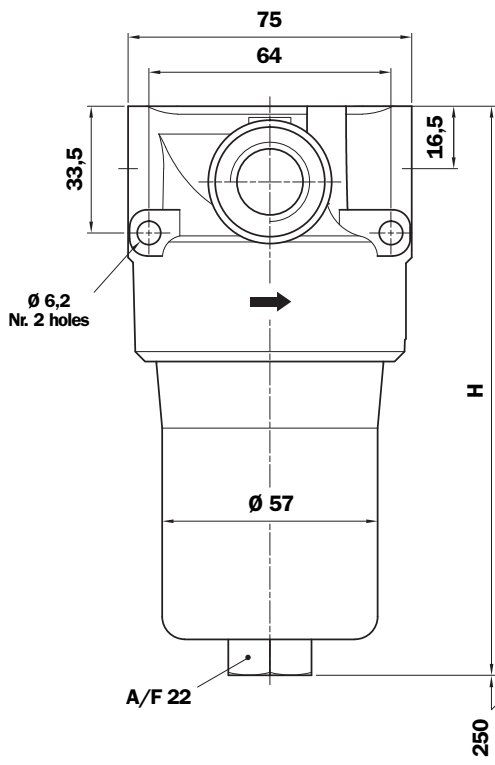
- Pressure drop of filter assembly equal to Δp 1,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.
- Connections of filter under test G 1/2".

Filtration

	Length	A03	A06	A10	A16	A25	M25
FMP 039	2	18	23	39	44	52	72
	3	30	33	48	54	64	77
	4	38	42	56	61	70	80

Series N - Flow rate l/min

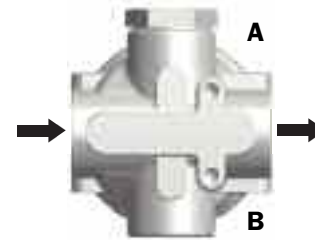
FMP 039



Execution 1: Without indicator connection



Execution 6: Double indicator connection (A - B)

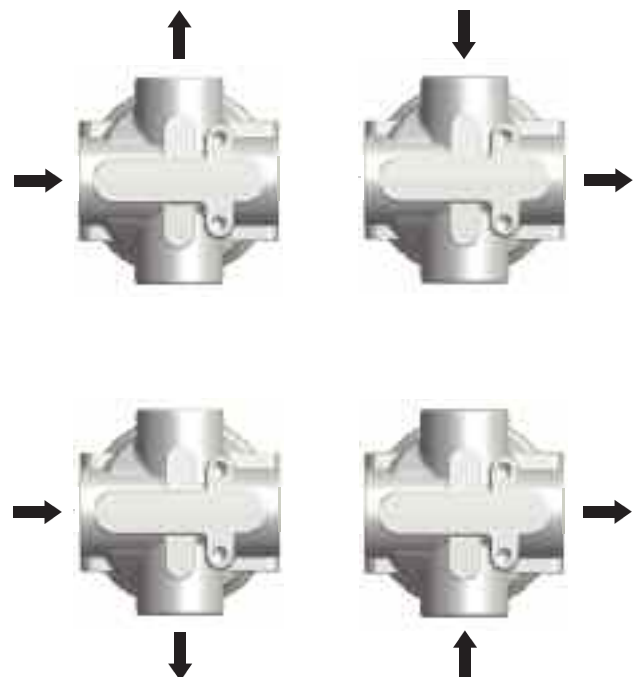


A:
Closure cap with standard T2 steel.
The position of the cap is reversible.

B:
Standard closure cap with plastic
thread protection.

If necessary, the second plug T2,
see page 15 ordering information.

Special connections on request

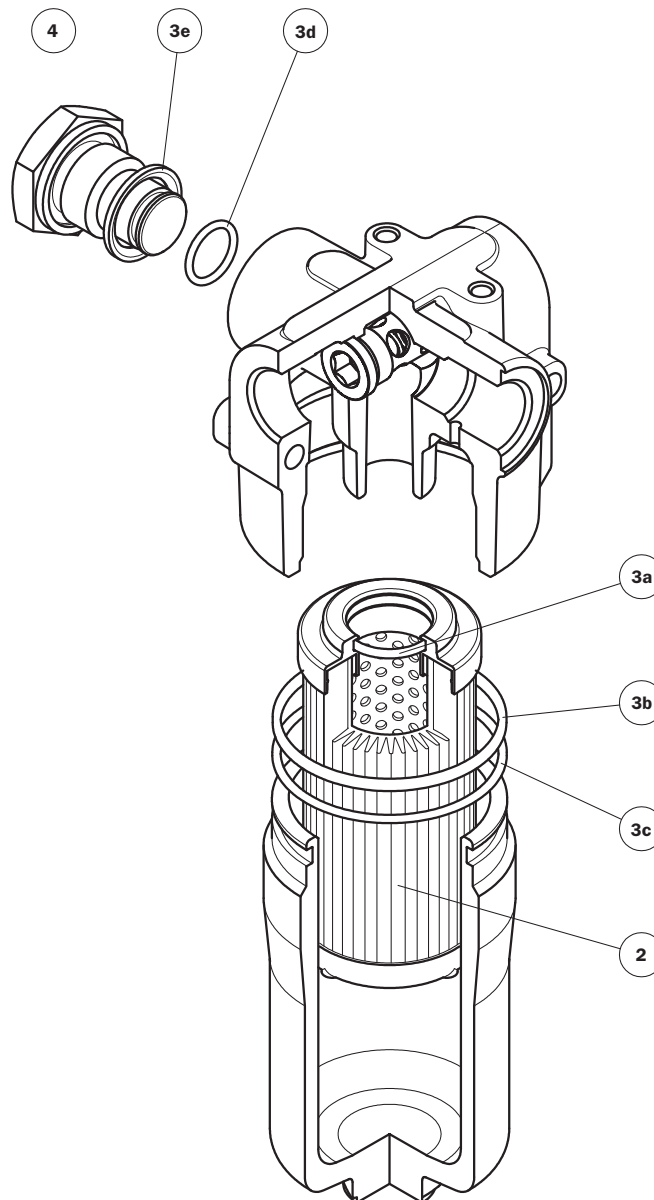


FMP 039

Length Filter	H mm
2	151
3	194
4	238

Thread connections

Type	Size	E Depth 6 mm
A	G 1/2"	M6
B	1/2" NPT	1/4" UNC
C	SAE 8 - 3/4" - 16 UNF	1/4" UNC



Item	Description	Q.ty	FILTER Series FMP 039	
1	Filter assembly	1	See order table	
2	Filter element	1	See order table	
3	Seal Kit	1	NBR 02050509	FPM 02050510
3a	O-Ring for filter element	1	O-R 4087 Ø 21,82 x 3,53	
3b	O-Ring for housing	1	O-R 3200 Ø 50,47 x 2,62	
3c	Anti-extrusion ring	1	Parbak 136 Ø 51,26 x 2,18	
3d	O-Ring indicator	2	O-R 2050 Ø 12,42 x 1,78	
3e	Seal	2	01030058 (HNBR)	01030046 (FPM)
4	Indicator connection plug	1	T2H	T2V

Filter assembly

FMP

Example: FMP

1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
039	2	B	A	A	1	A10	N	P01

Filter element

HP

Example: HP

1	2	7	4	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
039	2	A10	A	N	P01

1 - Style

Filter

039

Filter element

039

2 - Filter length

039

2 **3** **4**

3 - Valves

S

Without bypass

B

With bypass

4 - Filter seals

A

NBR

V

FPM

On request

5 - Connections

Threaded

FMP 039

Type	Size
A	G 1/2"
B	1/2" NPT
C	SAE 8 - 3/4" - 16 UNF

6 - Indicator port

1

Without indicator port

6

With 2 indicators port*

7 - Filter element

A03

Inorganic microfibre 3 μ

A06

Inorganic microfibre 6 μ

A10

Inorganic microfibre 10 μ

A16

Inorganic microfibre 16 μ

A25

Inorganic microfibre 25 μ

M25

Wire mesh 25 μ

Absolute filtration
Inorganic
Microfibre

$\beta_x(c) \geq 1000$

Nominal Filtration
Metal mesh

8 - Max filter element differential pressure

N

Δp 20 bar

9 - Option

P01

MP Filtri standard

Pxx

On request

*** Indicator plug:**

Phosphated Steel plug T2 has to be ordered separately.

Code

T2H

Seal NBR

T2V

Seal FPM

FMM 050 FHA 051

Maximum pressure
420 bar
Flow rate to
152 l/min

Maximum pressure
560 bar
Flow rate to
140 l/min



Technical data

FMM 050

Filter housing (Materials)

- Head: Cast iron (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: Steel

FHA 051

Filter housing (Materials)

- Head: Steel (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: Steel

FMM 050 - Pressure

- Working pressure: 420 bar (42 MPa)
- Test pressure: 630 bar (63 MPa)
- Burst pressure: 1260 bar (126 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 420 bar (42 MPa)

FHA 051 - Pressure

- Working pressure: 560 bar (56 MPa)
- Test pressure: 840 bar (84 MPa)
- Burst pressure: 1680 bar (168 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 560 bar (56 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar ±10%
- Other opening pressures on request.

FMM - FHA Δp Elements type

- Microfibre filter elements series N: 20 bar
- Microfibre filter elements series S: 210 bar
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

Seals

- Standard NBR series A
- Optional FPM series V

FMM FILTERS ARE PROVIDED FOR VERTICAL MOUNTING
FHA FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	1	2	3	4	5
• FMM050	3.11	3.48	3.90	4.36	5.54
• FHA051	3.28	3.65	4.06	4.54	5.74

Volumes (dm³)

Length	1	2	3	4	5
• FMM050	0.34	0.48	0.63	0.81	1.23
• FHA051	0.33	0.47	0.62	0.79	1.23

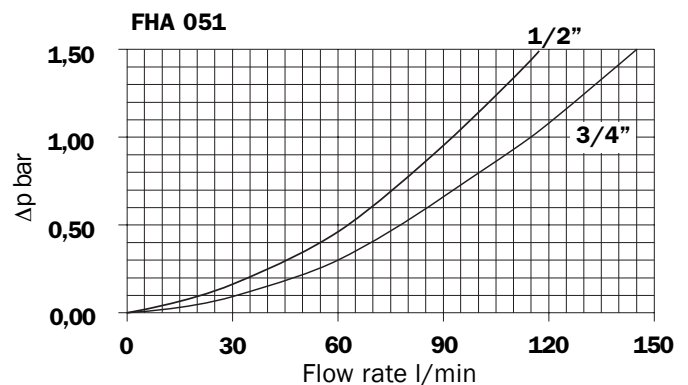
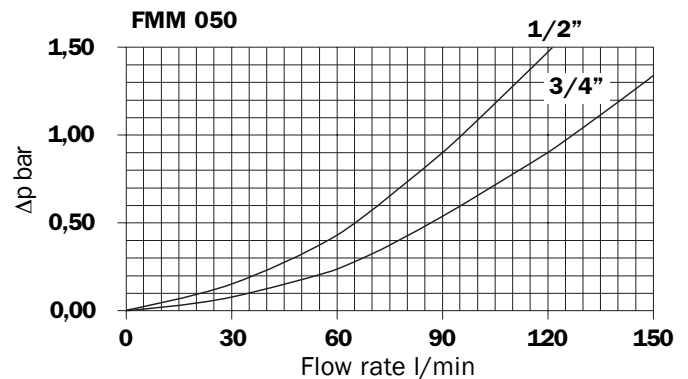
Connections

- FMM 050 - FHA 051: In-line Inlet/Outlet

Filter housings Δp pressure drop

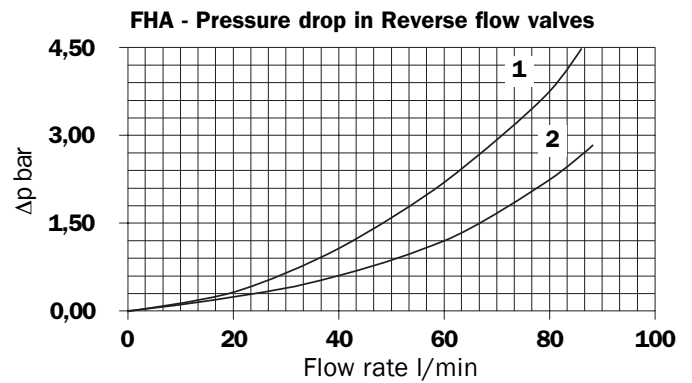
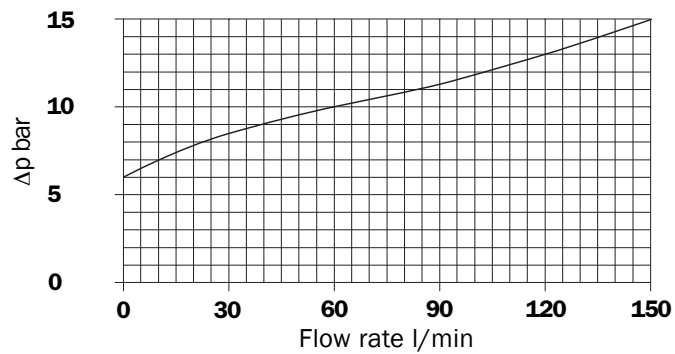
The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

Δp varies proportionally with density.



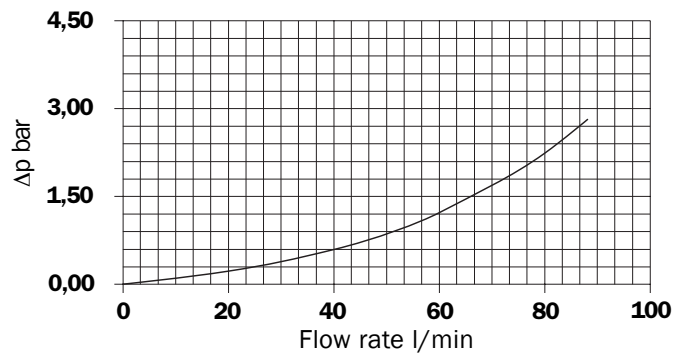
Valves (for FMM - FHA)

Bypass valve pressure drop



1 - Reverse flow
2 - In filter direction

FMM - Filter housing with check valve



Recommended maximum flow rate

- Pressure drop of filter assembly equal to Δp 1,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.
- Connections of filter under test G 3/4".

Filtration

	Length	A03	A06	A10	A16	A25	M25
FMM 050	1	44	44	80	82	110	140
	2	53	58	87	100	125	140
	3	68	71	100	110	135	140
	4	85	92	118	120	135	145
	5	110	112	130	135	140	152

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FMM 050	1	30	40	58	60	75
	2	45	50	78	90	119
	3	59	62	92	100	130
	4	75	82	106	112	135
	5	94	98	112	120	140

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHA 051	1	44	42	77	78	98	132
	2	52	55	82	91	112	135
	3	66	68	92	100	118	135
	4	80	85	105	108	120	135
	5	102	105	120	124	130	140

Serie N - Flow rate l/min

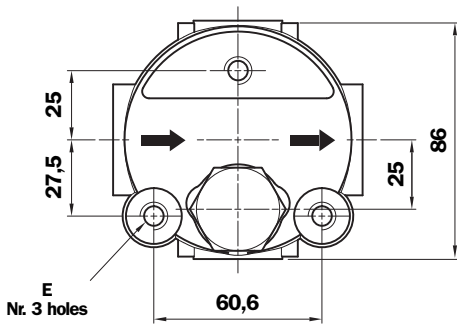
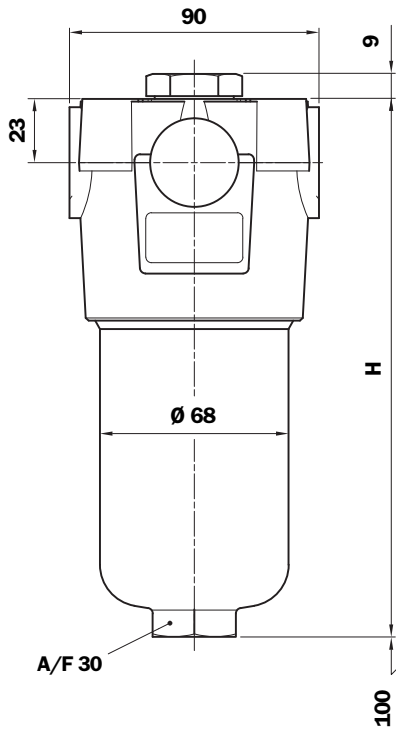
Filtration

	Length	A03	A06	A10	A16	A25
FHA 051	1	30	39	57	58	72
	2	45	49	74	84	105
	3	58	61	85	93	112
	4	75	78	98	105	115
	5	87	90	105	112	115

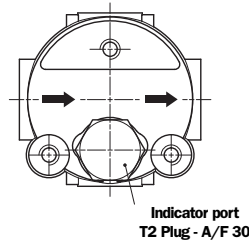
Serie H - Flow rate l/min

FMM 050 - FHA 051

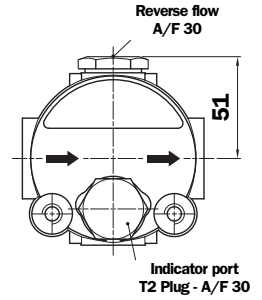
**FHA 051
With Reverse flow**



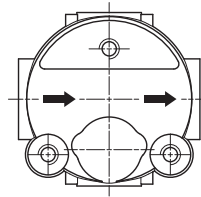
**Option P01
Standard indicator port**



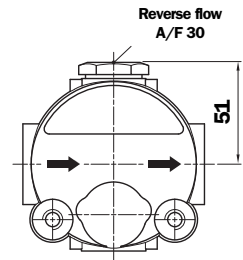
**Option P01
Standard indicator port**



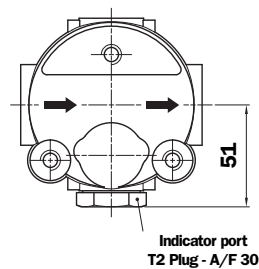
**Option P02
Without indicator port**



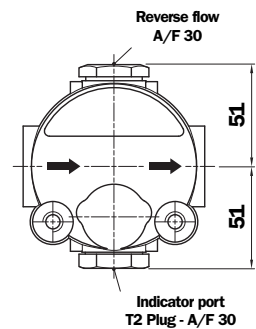
**Option P02
Without indicator port**



**Option P03
Indicator port 90°**



**Option P03
Indicator port 90°**

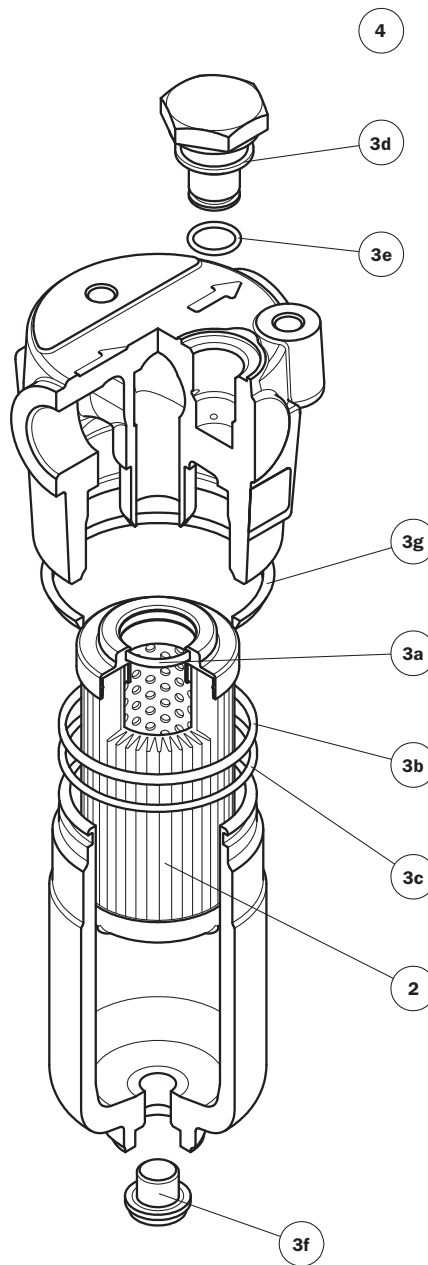


FMM - FHA

Length Filter	H mm
1	158
2	195
3	237
4	285
5	407

Thread connections

Type	Size	E Depth 12 mm
A	M18x1,5 - ISO 6149	M10
B	M22x1,5 - ISO 6149	M10
C	G 1/2"	M10
D	G 3/4"	M10
E	1/2" NPT	3/8" UNC
F	3/4" NPT	3/8" UNC
G	SAE 8 - 3/4" - 16 UNF	3/8" UNC
H	SAE 12 - 1 1/16" - 12 UN	3/8" UNC



Item	Description	Q.ty	FILTER Series			
			FMM 050		FHA 051	
1	Filter assembly	1	See order table			
2	Filter element	1	See order table			
3	Seal Kit	1	NBR 02050314	FPM 02050315	NBR 02050288	FPM 02050305
3a	Filter element seal	1	O-R 3093 Ø 23,67 x 2,62		O-R 3093 Ø 23,67 x 2,62	
3b	Bowl seal	1	O-R 3225 Ø 56,82 x 2,62		O-R 3227 Ø 60 x 2,62	
3c	Bowl seal anti-extrusion ring	1	Parbak 139 Ø 56,03 x 2,18		Parbak 141 Ø 59,21 x 2,18	
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78	
3f	Drain plug	1	G 1/4" with bonded seal		G 1/4" with bonded seal	
3g	Protective seal	1	01026521		01026521	
4	Indicator connection plug	1	T2H	T2V	T2H	T2V

Filter assembly FMM-FHA

	1	2	3	4	5	6	7	8a
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: FMM	050	2	B	A	C	A10	N	P01

Filter element HP

	1	2	6	4	7	8b
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: HP	050	2	A10	A	N	P01

1 - Style

FMM - Filter	Filter element
050	050
FHA - Filter	Filter element
051	050

6 - Filter element

A03	Inorganic microfibre 3 μ	} Absolute filtration Inorganic Microfibre $\beta_x(c) \geq 1000$
A06	Inorganic microfibre 6 μ	
A10	Inorganic microfibre 10 μ	
A16	Inorganic microfibre 16 μ	
A25	Inorganic microfibre 25 μ	
M25	Wire mesh 25 μ	} Nominal Filtration Metal mesh

2 - Filter length

050	1	2	3	4	5
051	1	2	3	4	5

7 - Max filter element differential pressure

N	Δp 20 bar
R	Δp 20 bar (filter with reverse flow + bypass)
S	Δp 210 bar

3 - Valves

S	Without bypass
B	With bypass
T	Without bypass + check valve*
D	With bypass + check valve*
V	With reverse flow* (only for FHA 051)
Z	With reverse flow + bypass* (only for FHA 051)

*Reduced cross-section oilways

8 - Option

a - Filter	
P01	Standard threaded connection for indicator
P02	Without threaded connection for indicator
P03	Threaded connection for 90° indicator (only for FHA)
Pxx	Customer request

4 - Filter seals

A	NBR
V	FPM
<input type="checkbox"/>	On request

b - Filter element

P01	MP Filtri standard
Pxx	Customer request

5 - Connections

Threaded

FMM 050 - FHA 051

Type	Size
A	M18x1,5 - ISO 6149
B	M22x1,5 - ISO 6149
C	G 1/2"
D	G 3/4"
E	1/2" NPT
F	3/4" NPT
G	SAE 8 - 3/4" - 16 UNF
H	SAE 12 - 1 1/16" - 12 UN

MP Filtri - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

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FMP



Maximum pressure 320 bar
Flow rates to 475 l/min



Technical data

Filter housing (Materials)

- Head: Cast iron (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: Brass
- Reverse Flow: Steel (only for series FMP 320)
- Check valve: Steel

Pressure

- Working pressure: 320 bar (32 MPa)
- Test pressure: 480 bar (48 MPa)
- Burst pressure: 960 bar (96 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 320 bar (32 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar \pm 10%
- Other opening pressures on request.

Δp Elements type

- Microfibre filter elements series N-R: 20 bar
- Microfibre filter elements series H-S: 210 bar
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

Seals

- Standard NBR series A
- Optional FPM series V

FMP FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	1	2	3	4
• FMP065	3.26	3.62	4.83	-
• FMP135	5.61	7.21	8.27	-
• FMP320	10.95	13.08	15.37	17.85

Volumes (dm³)

Length	1	2	3	4
• FMP065	0.36	0.47	0.84	-
• FMP135	0.45	0.78	1.00	-
• FMP320	1.03	1.75	2.52	3.35

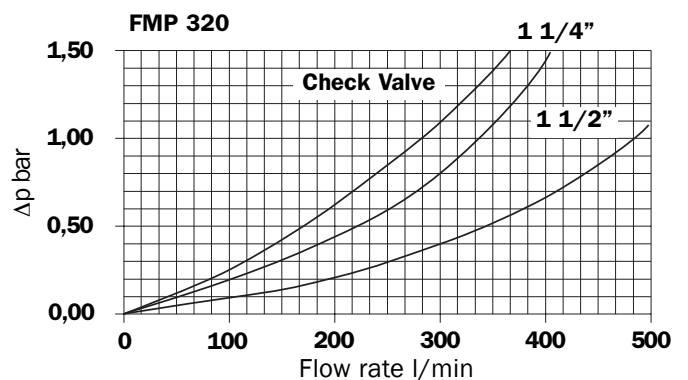
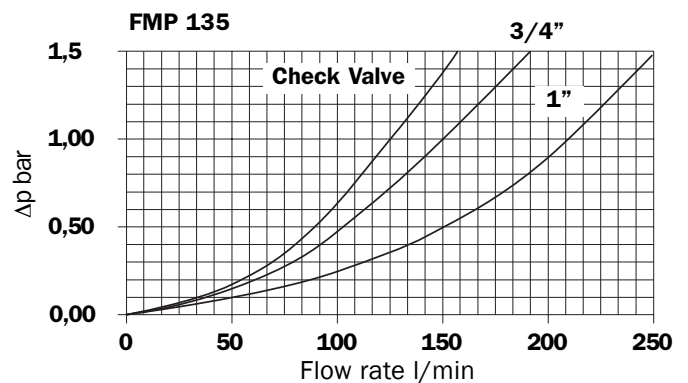
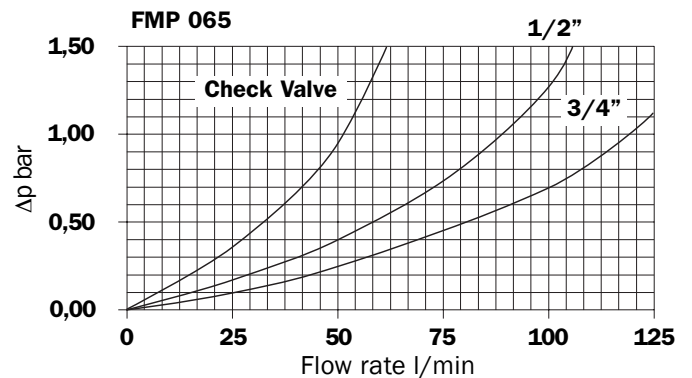
Connections

- FMP: In-line Inlet/Outlet

Filter housings Δp pressure drop

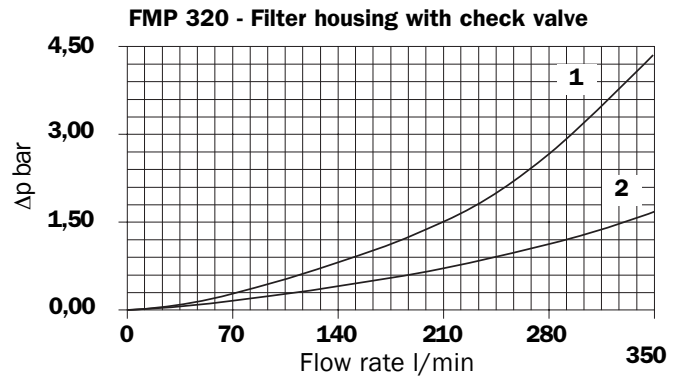
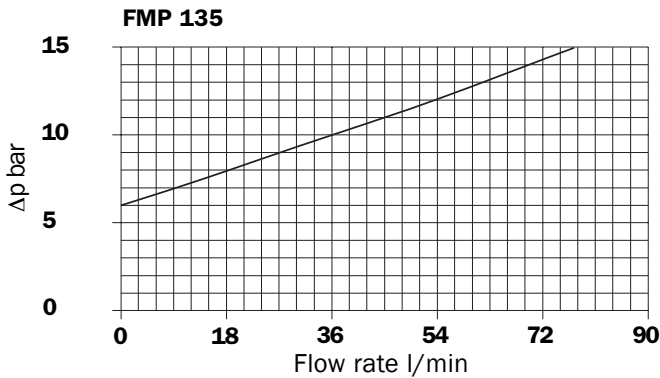
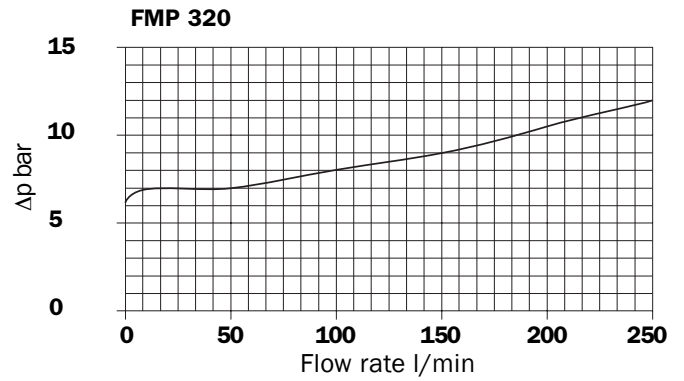
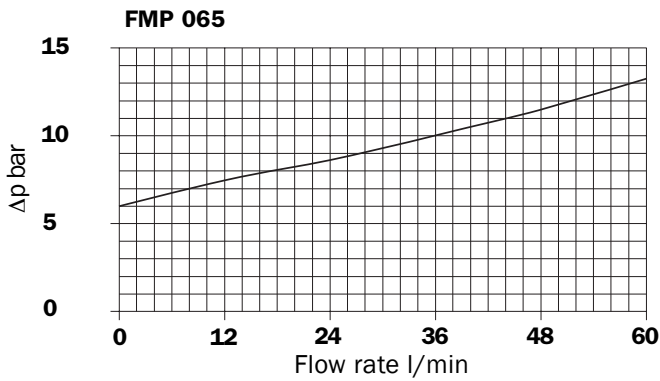
The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

Δp varies proportionally with density.



Valves

Bypass valve pressure drop



1 - Reverse flow
2 - In filter direction

Recommended maximum flow rate

- Pressure drop of filter assembly equal to Δp 1,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.
- Connections of filter under test G 3/4".

Filtration

	Length	A03	A06	A10	A16	A25	M25
FMP 065	1	23	30	48	53	72	105
	2	31	45	60	64	85	106
	3	53	61	79	84	94	108

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FMP 065	1	22	23	43	50	68
	2	30	35	57	68	77
	3	52	58	78	83	93

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FMP 135	1	66	74	112	120	157	180
	2	104	110	138	141	185	205
	3	138	141	170	178	190	208

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FMP 135	1	48	55	93	96	145
	2	87	104	127	129	160
	3	118	130	155	165	178

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FMP 320	1	126	137	230	280	300	440
	2	240	250	376	390	400	445
	3	300	330	427	440	450	460
	4	350	370	430	447	467	475

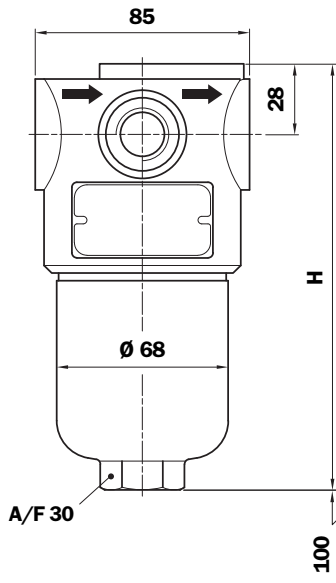
Serie N - Flow rate l/min

Filtration

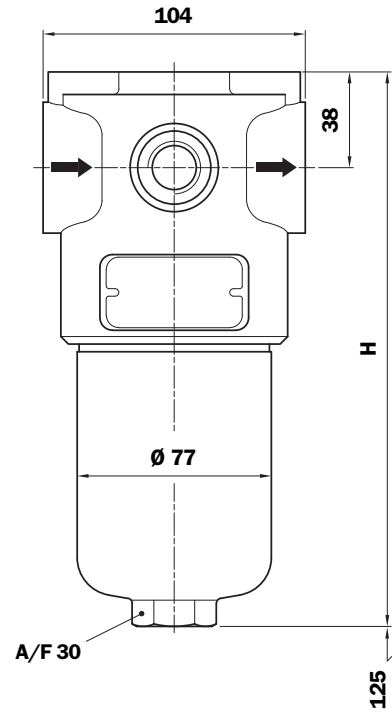
	Length	A03	A06	A10	A16	A25
FMP 320	1	107	112	185	193	250
	2	192	200	300	312	378
	3	255	300	367	375	417
	4	298	320	375	400	450

Serie H - Flow rate l/min

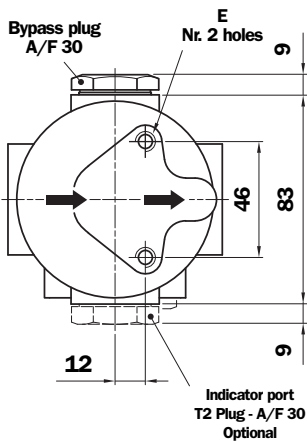
FMP 065



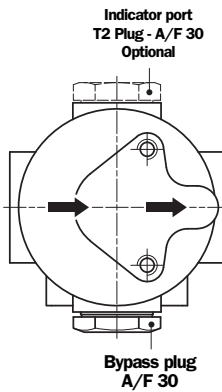
FMP 135



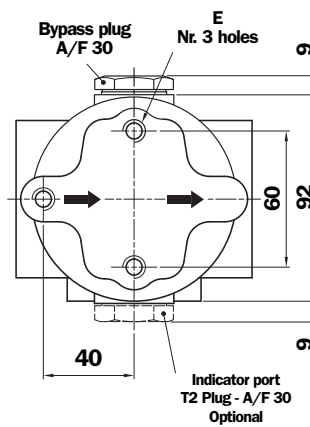
**Standard
Bypass side B**



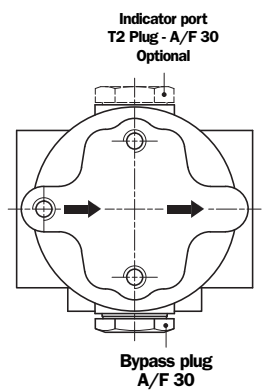
**Optional
Bypass side C**



**Standard
Indicator port side B**



**Optional
Indicator port side C**



FMP 065

Length Filter	H mm
1	169
2	200
3	302

FMP 135

Length Filter	H mm
1	221
2	334
3	409

FMP 065 - 135:

Indicator and bypass valve positions can be inverted.

FMP 065 - Thread connections

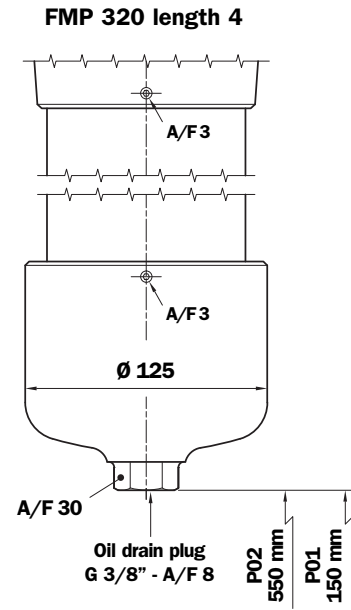
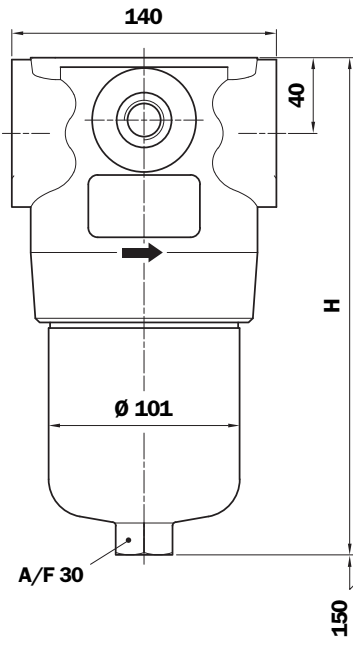
Type	Size	E Depth 15 mm
G1	G 1/2"	M8
G2	G 3/4"	M8
G3	1/2" NPT	5/16" UNC
G4	3/4" NPT	5/16" UNC
G5	SAE 8 - 3/4" - 16 UNF	5/16" UNC
G6	SAE 12 - 1 1/16" - 12 UN	5/16" UNC

FMP 135 - Thread connections

Type	Size	E Depth 10 mm
G1	G 3/4"	M10
G2	G 1"	M10
G3	3/4" NPT	3/8" UNC
G4	1" NPT	3/8" UNC
G5	SAE 12 - 1 1/16" - 12 UN	3/8" UNC
G6	SAE 16 - 1 5/16" - 12 UN	3/8" UNC

FMP 135 - Flange connections

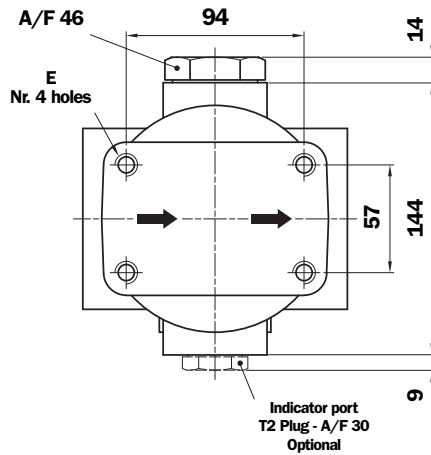
Type	Size	E Depth 10 mm
F1	3/4" SAE 3000 psi/M	M10
F2	1" SAE 3000 psi/M	M10
F3	3/4" SAE 3000 psi/UNC	3/8" UNC
F4	1" SAE 3000 psi/UNC	3/8" UNC



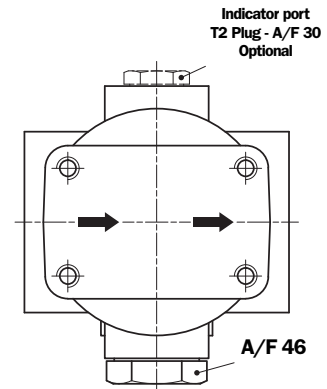
Style P01
Standard maintenance from head.

Style P02
Maintenance option from housing base.

Standard - Bypass side B



Optional - Bypass side C



FMP 320

Length Filter	H mm
1	263
2	386
3	518
4	671

Thread connections

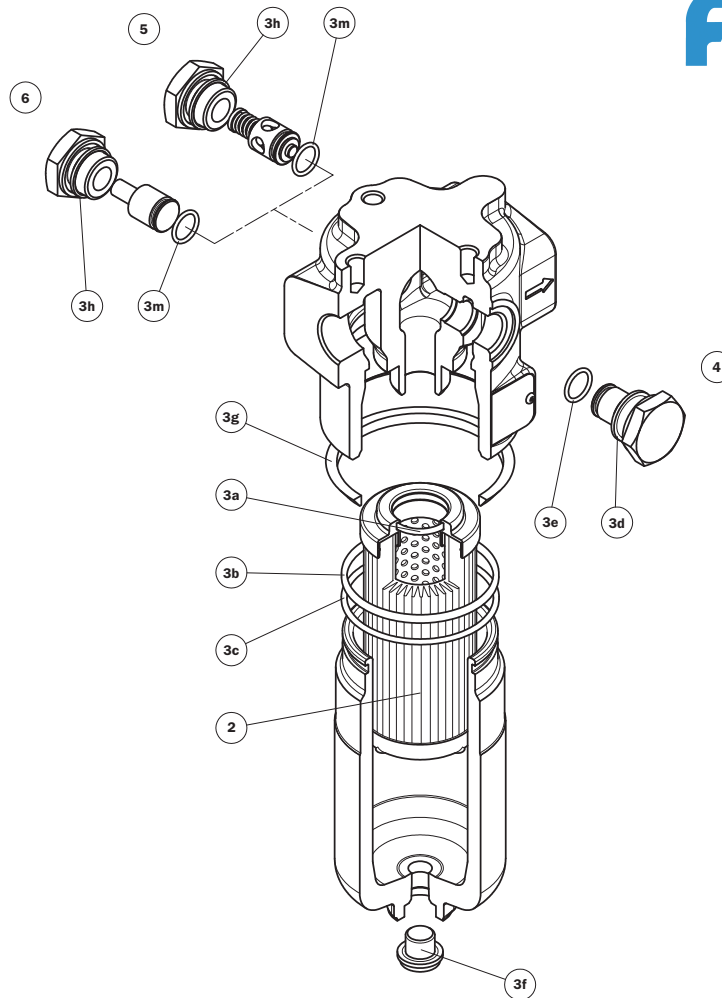
Type	Size	E Depth 15 mm
G1	G 1 1/4"	M12
G2	G 1 1/2"	M12
G3	1 1/4" NPT	1/2" UNC
G4	1 1/2" NPT	1/2" UNC
G5	SAE 20 - 1 5/8" - 12 UN	1/2" UNC
G6	SAE 24 - 1 7/8" - 12 UN	1/2" UNC

Flange connections

Type	Size	E Depth 15 mm
F1	1 1/4" SAE 3000 psi/M	M12
F2	1 1/2" SAE 3000 psi/M	M12
F3	1 1/4" SAE 3000 psi/UNC	1/2" UNC
F4	1 1/2" SAE 3000 psi/UNC	1/2" UNC

N.B.: 2" SAE 3000 see page 33 filter assembly FHP 500

Spare parts



Item	Description	Q.ty	FILTER Series					
			FMP 065		FMP 135		FMP 320	
1	Filter assembly	1	See order table					
2	Filter element	1	See order table					
3	Seal Kit	1	NBR 02050267	FPM 02050278	NBR 02050293	FPM 02050294	NBR 02050274	FPM 02050285
3a	Filter element seal	1	O-R 4100 Ø 24,99 x 3,53		O-R 3106 Ø 26,65 x 2,62		O-R 144 Ø 39,69 x 3,53	
3b	Bowl seal	1	O-R 159 Ø 55,56 x 3,53		O-R 3256 Ø 64,77 x 2,62		2 pcs	O-R 3350 Ø 88,57 x 2,62
3c	Bowl anti-extrusion ring	1	Parbak 227 Ø 54,53 x 3		Parbak 144 Ø 63,96 x 2,18		2 pcs	Parbak 153 Ø 89,36 x 2,18
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78	
3f	Drain plug	2	-		-		G 3/8" with bonded seal	
3g	Protective seal	1	01026521		01026509		01026510	
3h	Bp or Non-Bp seal	1	Bonded seal G 1/2"		Bonded seal G 1/2"		O-R 3143 (90 Sh A) Ø 36,14 x 2,62	
3m	Bp or Non-Bp seal	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 3106 Ø 26,65 x 2,62	
4	Indicator connection plug	1	T2H	T2V	T2H	T2V	T2H	T2V
5	Bypass assembly	1	02001312	02001385	02001312	02001385	02001396	02001397
6	Non-bypass assmby	1	02001314	02001386	02001314	02001386	02001398	02001399

Filter assembly	1	2	3	4	5	6	7	8a
FMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: FMP	065	2	B	A	G1	A03	N	P01

Filter element	1	2	6	4	7	8b
HP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: HP	065	2	A03	A	N	P01

1 - Style

Filter	Filter element
<input type="checkbox"/> 065	<input type="checkbox"/> 065
<input type="checkbox"/> 135	<input type="checkbox"/> 135
<input type="checkbox"/> 320	<input type="checkbox"/> 320

2 - Filter length

<input type="checkbox"/> 065	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
<input type="checkbox"/> 135	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
<input type="checkbox"/> 320	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
			<input type="checkbox"/> 4

3 - Valves

<input type="checkbox"/> S	Without bypass side B - Optional
<input type="checkbox"/> B	With bypass side B - Standard
<input type="checkbox"/> C	With bypass side C - Optional
<input type="checkbox"/> E	Without bypass side C - Optional
<input type="checkbox"/> T	Without bypass + check valve*
<input type="checkbox"/> D	With bypass side B + check valve*

*Reduced cross-section oilways

4 - Filter seals

<input type="checkbox"/> A	NBR
<input type="checkbox"/> V	FPM
<input type="checkbox"/>	On request

5 - Connections

Threaded

FMP 065

Type	Size
G1	G 1/2"
G2	G 3/4"
G3	1/2" NPT
G4	3/4" NPT
G5	SAE 8 - 3/4" - 16 UNF
G6	SAE 12 - 1 1/16" - 12 UN

FMP 135

Type	Size
G1	G 3/4"
G2	G 1"
G3	3/4" NPT
G4	1" NPT
G5	SAE 12 - 1 1/16" - 12 UN
G6	SAE 16 - 1.5/16" - 12 UN

FMP 320

Type	Size
G1	G 1 1/4"
G2	G 1 1/2"
G3	1 1/4" NPT
G4	1 1/2" NPT
G5	SAE 20 - 1.5/8" - 12 UN
G6	SAE 24 - 1 7/8" - 12 UN

Flanged

FMP 135

Type	Size
F1	3/4" SAE 3000 psi/M
F2	1" SAE 3000 psi/M
F3	3/4" SAE 3000 psi/UNC
F4	1" SAE 3000 psi/UNC

FMP 320

Type	Size
F1	1 1/4" SAE 3000 psi/M
F2	1 1/2" SAE 3000 psi/M
F3	1 1/4" SAE 3000 psi/UNC
F4	1 1/2" SAE 3000 psi/UNC

N.B.: 2" SAE 3000 see page 33 filter assembly FHP 500

6 - Filter element

<input type="checkbox"/> A03	Inorganic microfibre 3 μ	Absolute filtration Inorganic Microfibre βx (c) ≥ 1000
<input type="checkbox"/> A06	Inorganic microfibre 6 μ	
<input type="checkbox"/> A10	Inorganic microfibre 10 μ	
<input type="checkbox"/> A16	Inorganic microfibre 16 μ	
<input type="checkbox"/> A25	Inorganic microfibre 25 μ	
<input type="checkbox"/> M25	Wire mesh 25 μ	Nominal Filtration Metal mesh

7 - Max filter element differential pressure

<input type="checkbox"/> N	Δp 20 bar
<input type="checkbox"/> R	Δp 20 bar (filter with reverse flow + bypass)
<input type="checkbox"/> H	Δp 210 bar
<input type="checkbox"/> S	Δp 210 bar (filter with reverse flow)

8 - Option

a - Filter

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> P02	Maintenance from housing base (only for FMP 320 - 4)
<input type="checkbox"/> Pxx	Customer request

b - Filter element

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> Pxx	Customer request

*** Indicator plug:**

Steel plug T2 has to be ordered separately.

Code

<input type="checkbox"/> T2H	Seal NBR
<input type="checkbox"/> T2V	Seal FPM

MP Filtri - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

The data in this publication are purely guideline. MP Filtri reserves the right to make changes to the models described herein at any time it deems fit in relation to technical or commercial requirements. The colours of the products shown on the cover are purely guideline. Copyright. All rights reserved.

Maximum pressure 420 bar
Flow rates to 750 l/min



Technical data

Filter housing (Materials)

- Head: Cast iron (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: AISI 316L (FHP 010 - 011)
Brass (FHP 065 - 135 - 320)
Steel (FHP 500)
- Reverse Flow: Steel (FHP 320 - FHP 500)
- Check valve: Steel

Pressure

- Working pressure: 420 bar (42 MPa)
- Test pressure: 630 bar (63 MPa)
- Burst pressure: 1260 bar (126 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 420 bar (42 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar \pm 10%
- Other opening pressures on request.

FHP Δp Elements type

- Microfibre filter elements series N: 20 bar
- Microfibre filter elements series R*: 20 bar
*Excluded FHP 010-011 and FHP 500
- Microfibre filter elements series H: 210 bar
- Microfibre filter elements series S: 210 bar (FHP 500)
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

Seals

- Standard NBR series A
- Optional FPM series V

FHP FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	1	2	3	4	5
• FHP010	2.05	2.18	2.64	3.13	-
• FHP065	4.26	4.62	5.83	-	-
• FHP135	7.11	8.71	9.76	-	-
• FHP320	13.95	16.08	18.37	20.85	-
• FHP500	27	31.17	34.69	46.7	52.5

Volumes (dm³)

Length	1	2	3	4	5
• FHP010	0.10	0.12	0.15	0.20	-
• FHP065	0.25	0.30	0.50	-	-
• FHP135	0.43	0.76	0.97	-	-
• FHP320	1.00	1.72	2.49	3.32	-
• FHP500	1.71	2.43	3.04	5.18	6.51

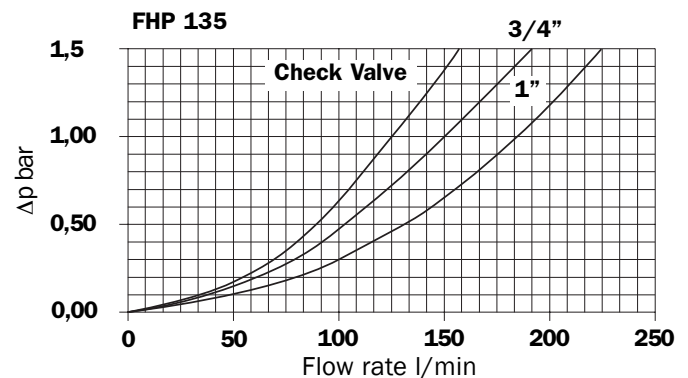
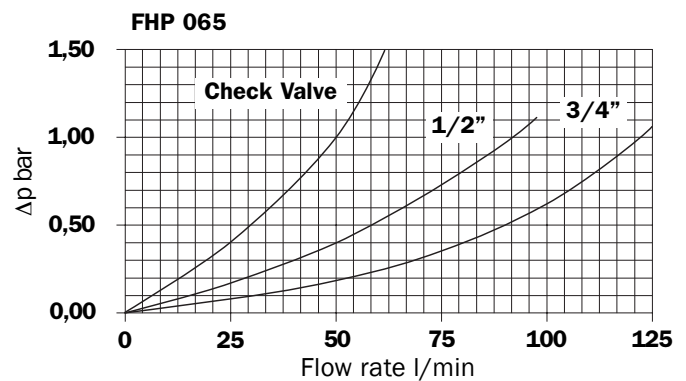
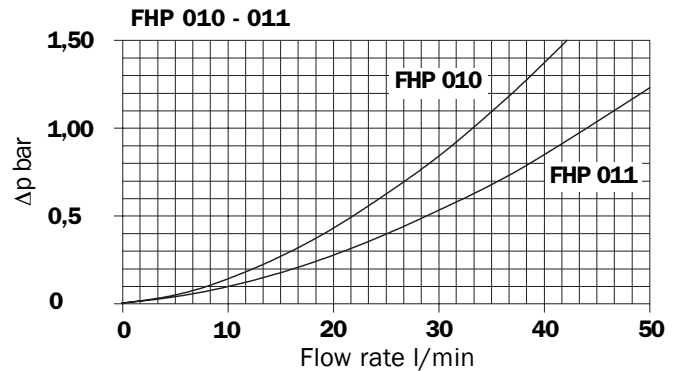
Connections

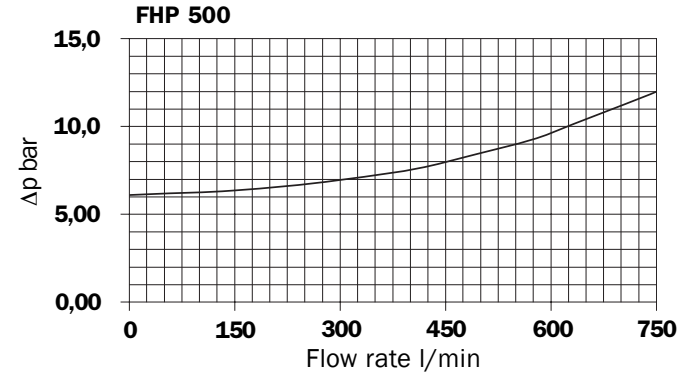
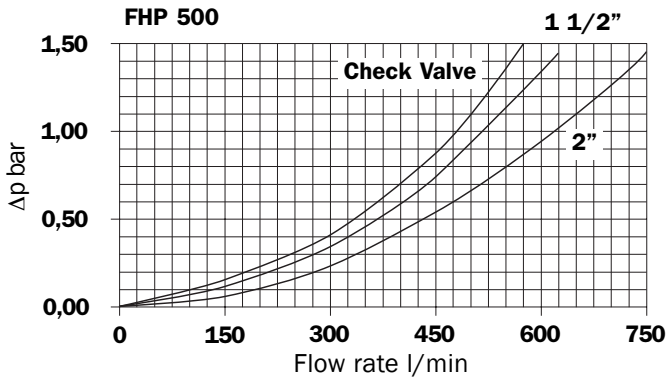
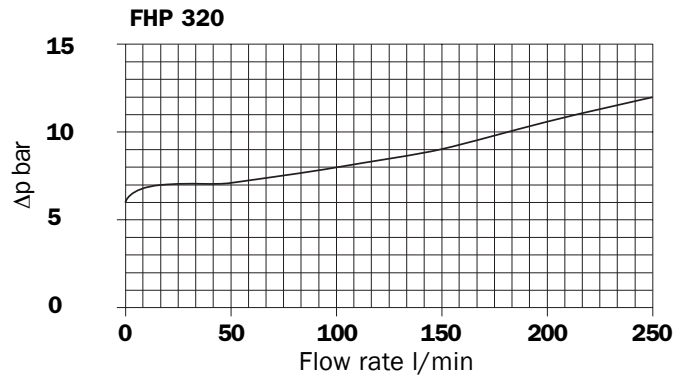
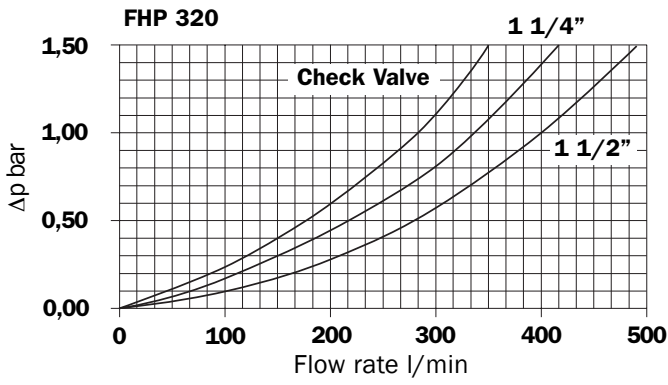
- FHP 010 - 065 - 135 - 500: In-line Inlet/Outlet
- FHP 011 - 320: 90° Inlet/Outlet

Filter housings Δp pressure drop

The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

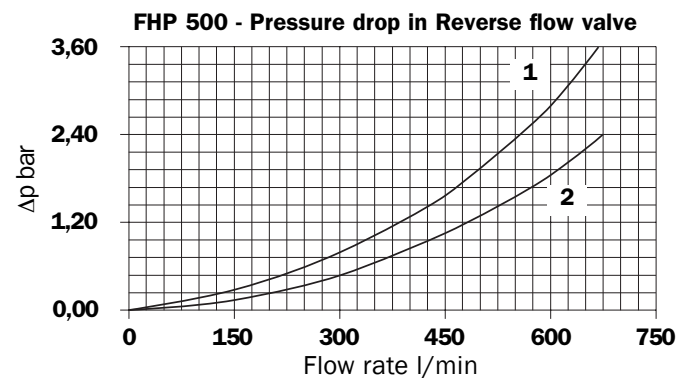
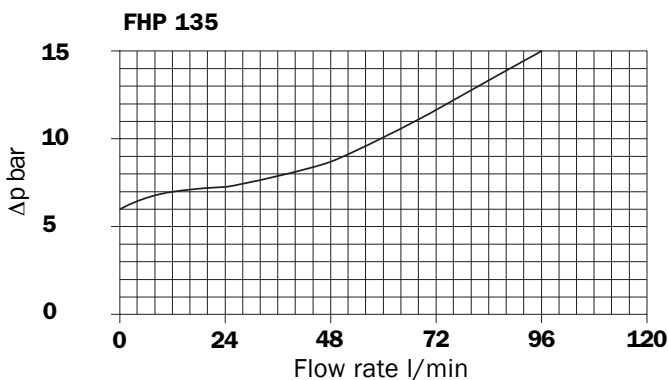
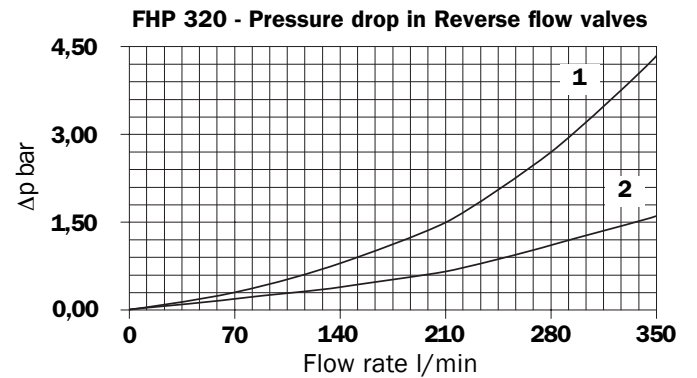
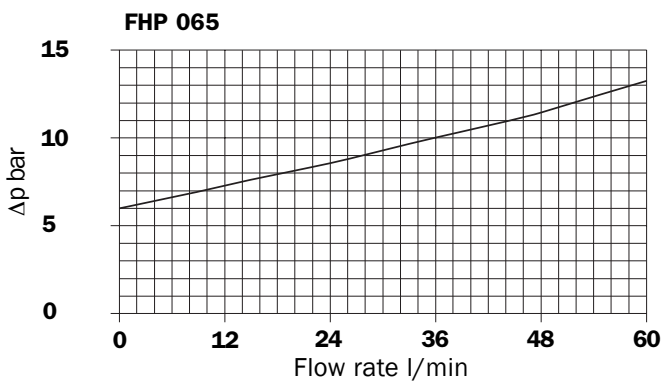
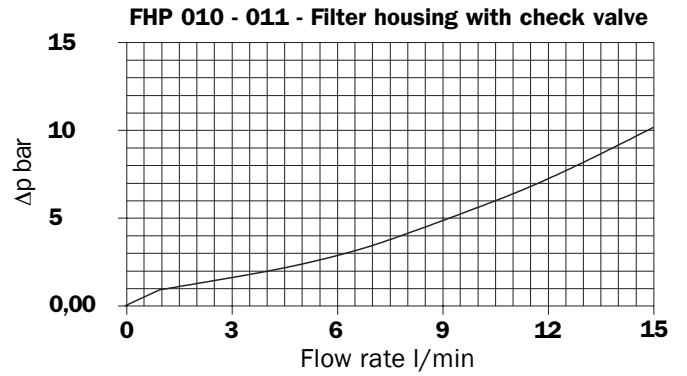
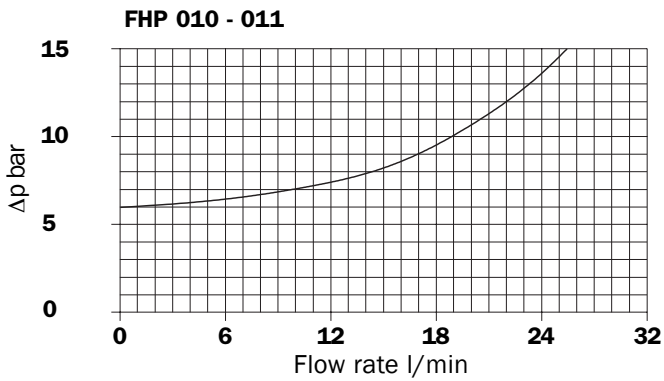
Δp varies proportionally with density.





Valves

Bypass valve pressure drop



1 - Reverse flow
2 - In filter direction

Recommended maximum flow rate

- Pressure drop of filter assembly equal to Δp 1,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.
- Connections of filter under test G 3/4".
- Connections of filter under test FLANGE 2" SAE 6000 PSI (only for FHP 500).

	Filtration						
	Length	A03	A06	A10	A16	A25	M25
FHP 010	1	4	6	8	9	11	15
	2	6	8	16	18	22	25
	3	11	14	20	25	28	30
	4	15	18	23	28	32	36

Serie N - Flow rate l/min

	Filtration					
	Length	A03	A06	A10	A16	A25
FHP 010	1	3	4	6	7	8
	2	5	6	13	16	20
	3	10	13	18	20	26
	4	11	15	23	25	28

Serie H - Flow rate l/min

	Filtration						
	Length	A03	A06	A10	A16	A25	M25
FHP 011	1	4	6	8	9	11	15
	2	6	9	16	18	23	30
	3	11	15	22	26	31	35
	4	15	20	28	31	35	40

Serie N - Flow rate l/min

	Filtration					
	Length	A03	A06	A10	A16	A25
FHP 011	1	3	5	6	7	8
	2	5	6	14	16	21
	3	10	14	21	24	28
	4	12	15	24	26	31

Serie H - Flow rate l/min

	Filtration						
	Length	A03	A06	A10	A16	A25	M25
FHP 065	1	24	32	55	60	88	105
	2	33	50	70	78	102	110
	3	60	70	100	106	118	120

Serie N - Flow rate l/min

	Filtration					
	Length	A03	A06	A10	A16	A25
FHP 065	1	23	24	50	58	80
	2	32	38	67	70	95
	3	55	65	90	95	110

Serie H - Flow rate l/min

	Filtration						
	Length	A03	A06	A10	A16	A25	M25
FHP 135	1	67	71	110	120	155	180
	2	105	110	138	142	180	205
	3	138	140	175	179	190	210

Serie N - Flow rate l/min

	Filtration					
	Length	A03	A06	A10	A16	A25
FHP 135	1	48	55	93	97	145
	2	88	105	128	130	160
	3	120	130	155	165	180

Serie H - Flow rate l/min

	Filtration						
	Length	A03	A06	A10	A16	A25	M25
FHP 320	1	126	139	230	270	320	410
	2	248	270	365	380	420	430
	3	310	340	410	420	430	440
	4	345	360	415	430	440	450

Serie N - Flow rate l/min

	Filtration					
	Length	A03	A06	A10	A16	A25
FHP 320	1	107	112	185	193	290
	2	192	220	300	305	365
	3	255	295	355	365	400
	4	295	315	362	370	405

Serie H - Flow rate l/min

	Filtration						
	Length	A03	A06	A10	A16	A25	M25
FHP 500	1	280	320	425	450	495	720
	2	340	375	385	495	550	730
	3	435	460	570	575	620	740
	4	480	540	600	610	640	745
	5	540	560	625	640	675	750

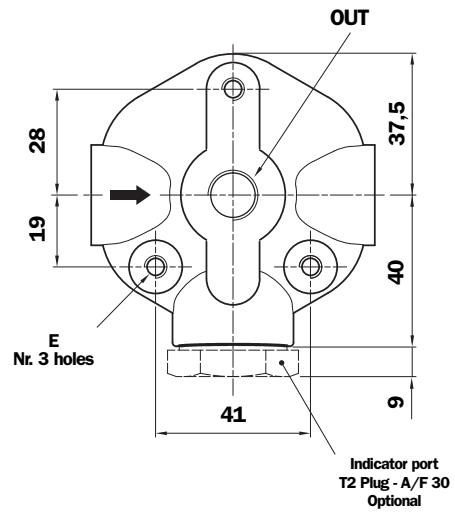
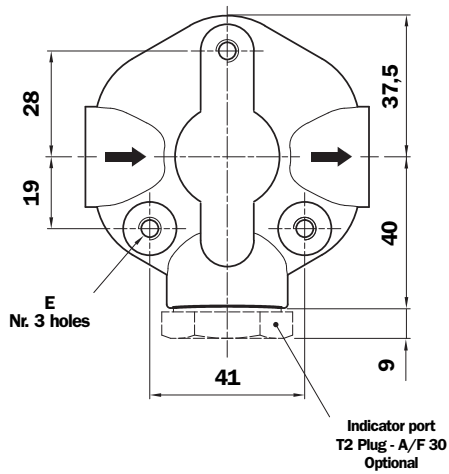
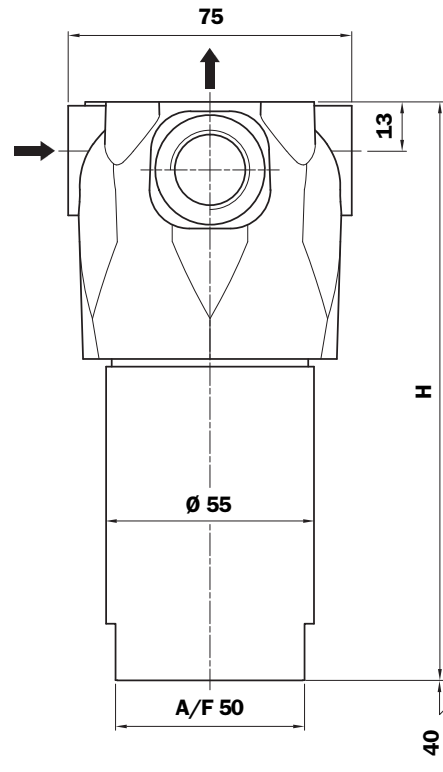
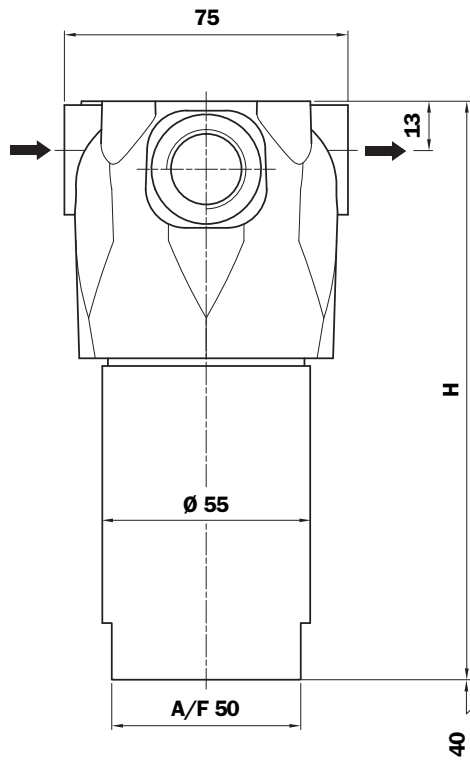
Serie N - Flow rate l/min

	Filtration					
	Length	A03	A06	A10	A16	A25
FHP 500	1	145	160	260	280	390
	2	240	270	380	390	440
	3	310	320	440	455	520
	4	360	410	510	520	590
	5	470	480	570	585	650

Serie H - Flow rate l/min

FHP 010

FHP 011



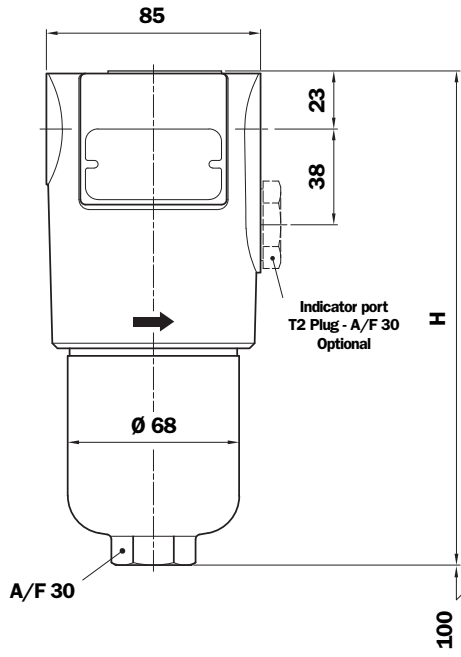
FHP 010 - 011

Length Filter	H mm
1	92
2	103
3	153
4	203

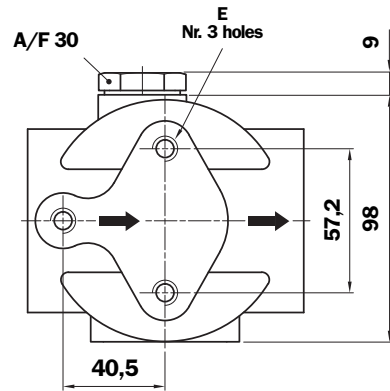
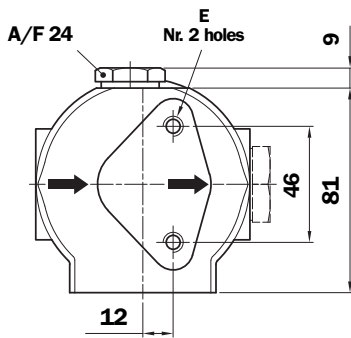
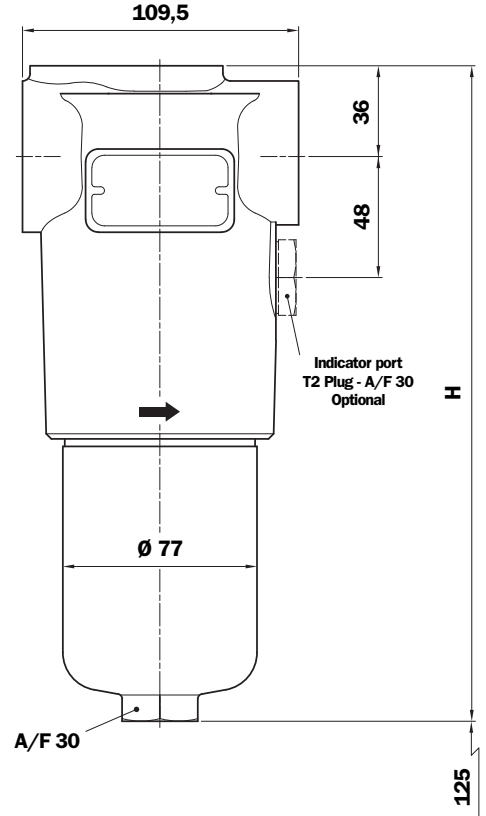
Thread connections

Type	Size	E Depth 12 mm
A	G 1/4"	M6
B	1/4" NPT	1/4" UNC
C	SAE 5 - 1/2" - 20 UNF	1/4" UNC
D	G 3/8"	M6
E	3/8" NPT	1/4" UNC
F	SAE 6 - 9/16" - 18 UNF	1/4" UNC

FHP 065



FHP 135



FHP 065

Length Filter	H mm
1	196
2	227
3	329

FHP 135

Length Filter	H mm
1	260
2	373
3	448

FHP 065 - Thread connections

Type	Size	E Depth 15 mm
G1	G 1/2"	M8
G2	G 3/4"	M8
G3	1/2" NPT	5/16" UNC
G4	3/4" NPT	5/16" UNC
G5	SAE 8 - 3/4" - 16 UNF	5/16" UNC
G6	SAE 12 - 1 1/16" - 12 UN	5/16" UNC

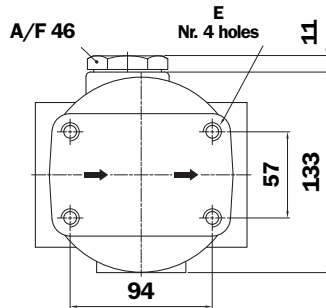
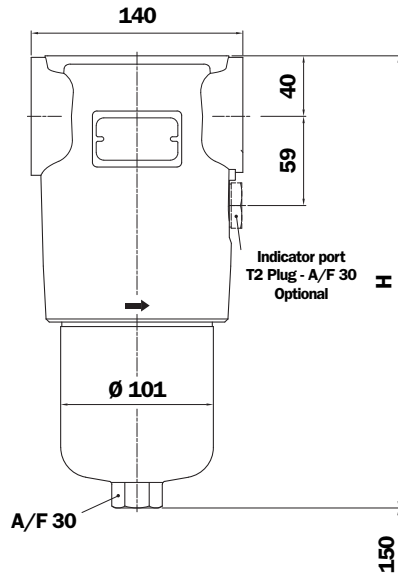
FHP 135 - Thread connections

Type	Size	E Depth 10 mm
G1	G 3/4"	M10
G2	G 1"	M10
G3	3/4" NPT	3/8" UNC
G4	1" NPT	3/8" UNC
G5	SAE 12 - 1 1/16" - 12 UN	3/8" UNC
G6	SAE 16 - 1 5/16" - 12 UN	3/8" UNC

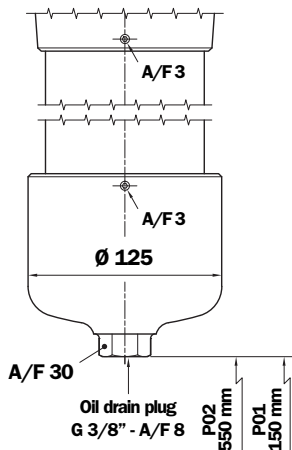
FHP 135 - Flange connections

Type	Size	E Depth 10 mm
F1	3/4" SAE 3000 psi/M	M10
F2	1" SAE 3000 psi/M	M10
F3	3/4" SAE 3000 psi/UNC	3/8" UNC
F4	1" SAE 3000 psi/UNC	3/8" UNC
F5	3/4" SAE 6000 psi/M	M10
F6	3/4" SAE 6000 psi/UNC	3/8" UNC

FHP 320

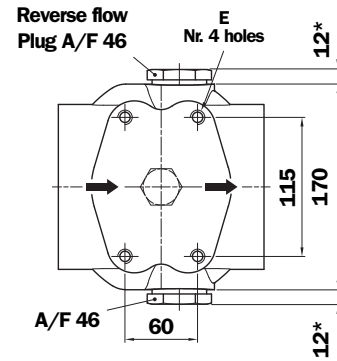
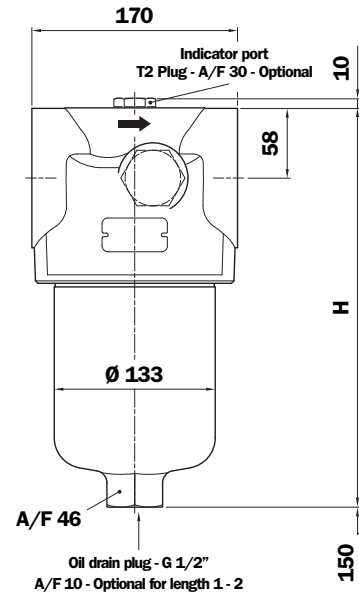


FHP 320 length 4



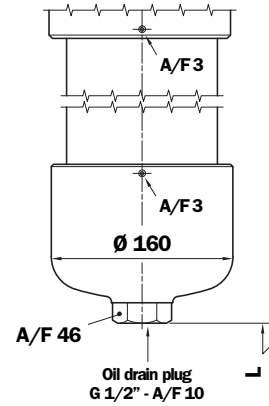
Style P01
Standard maintenance from head.
Style P02
Maintenance option from housing base.

FHP 500



* Only for Reverse flow

FHP 500 length 4 - 5



FHP 320 - Thread connections

Type	Size	E Depth 15 mm
G1	G 1 1/4"	M12
G2	G 1 1/2"	M12
G3	1 1/4" NPT	1/2" UNC
G4	1 1/2" NPT	1/2" UNC
G5	SAE 20 - 1 5/8" - 12 UN	1/2" UNC
G6	SAE 24 - 1 7/8" - 12 UN	1/2" UNC

FHP 320 - Flange connections

Type	Size	E Depth 15 mm
F1	1 1/4" SAE 3000 psi/M	M12
F2	1 1/2" SAE 3000 psi/M	M12
F3	1 1/4" SAE 3000 psi/UNC	1/2" UNC
F4	1 1/2" SAE 3000 psi/UNC	1/2" UNC
F5	1 1/4" SAE 6000 psi/M	M12
F6	1 1/4" SAE 6000 psi/UNC	1/2" UNC

FHP 320

Length Filter	H mm
1	299
2	422
3	554
4	707

FHP 500

Length Filter	H mm
1	330
2	420
3	496
4	654
5	820

FHP 500 - Thread connections

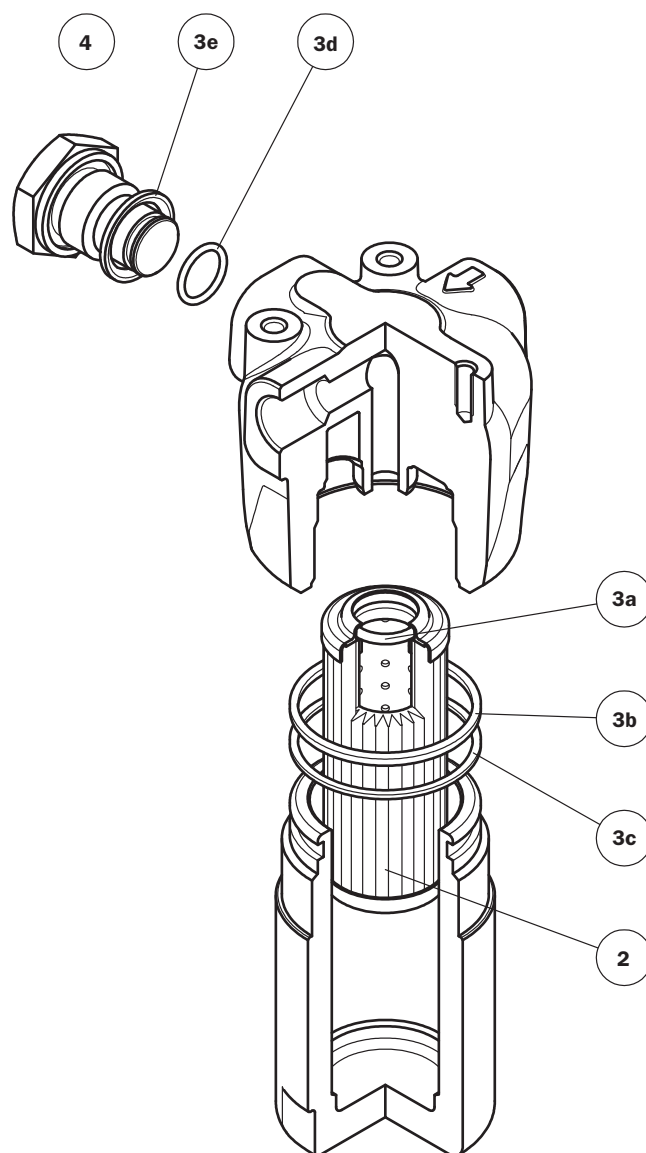
Type	Size	E Depth 15 mm
G1	G 1 1/2"	M12
G2	1 1/2" NPT	1/2" UNC
G3	SAE 24 - 1 7/8" - 12 UN	1/2" UNC

FHP 500 - Flange connections

Type	Size	E Depth 15 mm
F1	1 1/2" SAE 3000 psi/M	M12
F2	1 1/2" SAE 3000 psi/UNC	1/2" UNC
F3	2" SAE 3000 psi/M	M12
F4	2" SAE 3000 psi/UNC	1/2" UNC
F5	1 1/2" SAE 6000 psi/M	M12
F6	1 1/2" SAE 6000 psi/UNC	1/2" UNC
F7	2" SAE 6000 psi/M	M12
F8	2" SAE 6000 psi/UNC	1/2" UNC

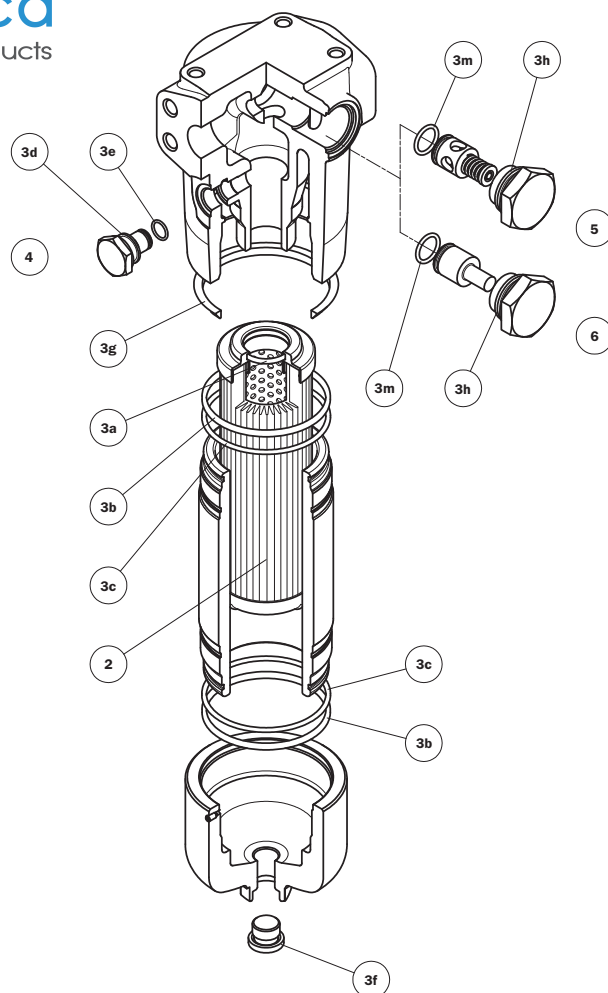
Style P01	
Filter length	L (mm)
4 - 5	150

Style P02	
Filter length	L (mm)
4	480
5	650

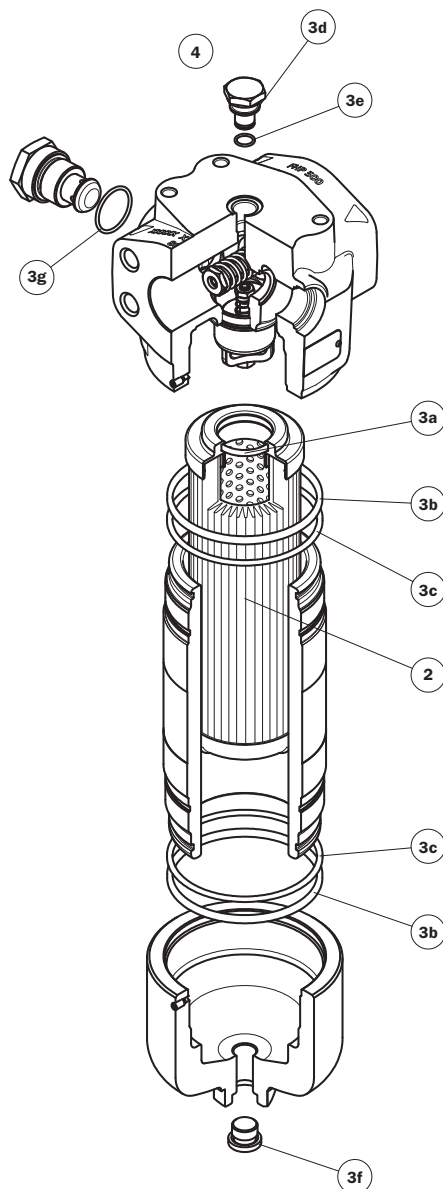


Item	Description	Q.ty	FILTER Series FHP 010 - 011	
1	Filter assembly	1	See order table	
2	Filter element	1	See order table	
3	Seal Kit	1	NBR 02050501	FPM 02050492
3a	O-Ring for filter element	1	O-R 121 Ø 15,88 x 2,62	
3b	O-Ring for housing	1	O-R 3168 Ø 42,52 x 3,53	
3c	Anti-extrusion ring	1	Parbak 131 Ø 43,33 x 2,18	
3d	Indicator seal	1	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78	
4	Indicator connection plug	1*	T2H	T2V

* 0 for version 1 (without indicator port)
1 for version 2 (with indicator port)



Item	Description	Q.ty	FILTER Series					
			FHP 065		FHP 135		FHP 320	
1	Filter assembly	1	See order table					
2	Filter element	1	See order table					
3	Seal Kit	1	NBR 02050265	FPM 02050276	NBR 02050269	FPM 02050280	NBR 02050272	FPM 02050283
3a	Filter element seal	1	O-R 4100 Ø 24,99 x 3,53		O-R 3106 Ø 26,65 x 2,62		O-R 144 Ø 39,69 x 3,53	
3b	Bowl seal	1	O-R 159 Ø 55,56 x 3,53		O-R 3256 Ø 64,77 x 2,62		2 pcs	O-R 3350 Ø 88,57 x 2,62
3c	Bowl anti-extrusion ring	1	Parbak 227 Ø 54,53 x 3		Parbak 144 Ø 63,96 x 2,18		2 pcs	Parbak 153 Ø 89,36 x 2,18
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78	
3f	Drain plug	2	-		-		G 3/8" with bonded seal	
3g	Protective seal	1	01026521		01026509		01026510	
3h	Bp or Non-Bp seal	1	O-R 121 (90 Sh A) Ø 15,88 x 2,62		O-R 3087 (90 Sh A) Ø 21,89 x 2,62		O-R 3143 (90 Sh A) Ø 36,14 x 2,62	
3m	Bp or Non-Bp seal	1	O-R 2031 Ø 7,66 x 1,78		O-R 2037 Ø 9,25 x 1,78		O-R 2081 Ø 20,35 x 1,78	
4	Indicator connection plug	1	T2H	T2V	T2H	T2V	T2H	T2V
5	Bypass assembly	1	02001116	02001136	02001117	02001137	02001118	02001138
6	Non-bypass assmby	1	02001142	02001139	02001143	02001392	02001144	02001395

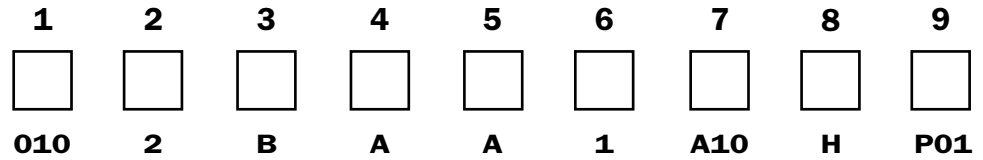


Item	Description	Q.ty	FILTER Series FHP 500	
1	Filter assembly	1	See order table	
2	Filter element	1	See order table	
3	Seal Kit	1	NBR 02050330	FPM 02050331
3a	Filter element seal	1	O-R 153 Ø 49,21 x 3,53	
3b	Bowl seal	1	O-R 4462 Ø 117,10 x 3,53	
3c	Bowl seal anti-extrusion ring	1	Parbak 247 Ø 117,63 x 3	
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78	
3f	Drain plug	1	G 1/2" with bonded seal	
3g	Reverse flow seal	1	O-R 3143 (90 Sh A) Ø 36,14 x 2,62	
4	Indicator connection plug	1	T2H	T2V

Filter assembly

FHP

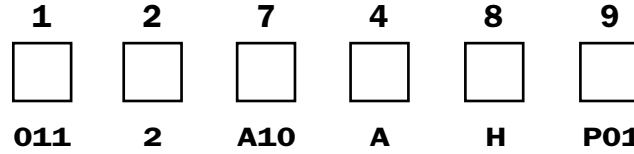
Example: FHP



Filter element

HP

Example: HP



1 - Style

Filter

- 010**
- 011**

Filter element

- 011**
- 011**

6 - Indicator port

- 1** Without indicator port
- 2** With indicator port

2 - Filter length

- 010**
- 011**

- | | | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |

3 - Valves

- S** Without bypass
- B** With bypass (opening pressure: 6 bar)
- V** With reverse flow + without bypass
- Z** With reverse flow + bypass

4 - Filter seals

- A** NBR
- V** FPM
- On request

5 - Connections

Threaded

FHP 010 - 011

Type	Size
A	G 1/4"
B	1/4" NPT
C	SAE 5 - 1/2" - 20 UNF
D	G 3/8"
E	3/8" NPT
F	SAE 6 - 9/16" - 18 UNF

7 - Filter element

- A03** Inorganic microfibre 3 μ
 - A06** Inorganic microfibre 6 μ
 - A10** Inorganic microfibre 10 μ
 - A16** Inorganic microfibre 16 μ
 - A25** Inorganic microfibre 25 μ
 - M25** Wire mesh 25 μ
- Absolute filtration
 Inorganic
 Microfibre
 $\beta_x(c) \geq 1000$
 Nominal Filtration
 Metal mesh

8 - Max filter element differential pressure

- N** Δp 20 bar
- H** Δp 210 bar

9 - Option

- P01** MP Filtri standard
- Pxx** Customer request

*** Indicator plug:**

Phosphated Steel plug T2 has to be ordered separately.

Code

- T2H** Seal NBR
- T2V** Seal FPM

Filter assembly

FHP

Example: FHP

1	2	3	4	5	6	7	8a
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
135	1	S	A	G1	A03	H	P01

Filter element

HP

Example: HP

1	2	6	4	7	8b
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
135	1	A03	A	H	P01

1 - Style

Filter	Filter element
065	065
135	135
320	320

2 - Filter length

065	1	2	3	
135	1	2	3	
320	1	2	3	4

3 - Valves

S	Without bypass
B	With bypass
T	Without bypass + check valve*
D	With bypass + check valve*
V	With reverse flow (only for size 320)*
Z	With reverse flow + bypass (only for size 320)*

*Reduced cross-section oilways

4 - Filter seals

A	NBR
V	FPM
<input type="checkbox"/>	On request

5 - Connections

Threaded

FHP 065

Type	Size
G1	G 1/2"
G2	G 3/4"
G3	1/2" NPT
G4	3/4" NPT
G5	SAE 8 - 3/4" - 16 UNF
G6	SAE 12 - 1 1/16" - 12 UN

FHP 135

Type	Size
G1	G 3/4"
G2	G 1"
G3	3/4" NPT
G4	1" NPT
G5	SAE 12 - 1 1/16" - 12 UN
G6	SAE 16 - 1 5/16" - 12 UN

FHP 320

Type	Size
G1	G 1 1/4"
G2	G 1 1/2"
G3	1 1/4" NPT
G4	1 1/2" NPT
G5	SAE 20 - 1 5/8" - 12 UN
G6	SAE 24 - 1 7/8" - 12 UN

Flanged

FHP 135

Type	Size
F1	3/4" SAE 3000 psi/M
F2	1" SAE 3000 psi/M
F3	3/4" SAE 3000 psi/UNC
F4	1" SAE 3000 psi/UNC
F5	3/4" SAE 6000 psi/M
F6	3/4" SAE 6000 psi/UNC

FHP 320

Type	Size
F1	1 1/4" SAE 3000 psi/M
F2	1 1/2" SAE 3000 psi/M
F3	1 1/4" SAE 3000 psi/UNC
F4	1 1/2" SAE 3000 psi/UNC
F5	1 1/4" SAE 6000 psi/M
F6	1 1/4" SAE 6000 psi/UNC

6 - Filter element

A03	Inorganic microfibre 3 µ	Absolute filtration Inorganic Microfibre β _s (c) ≥ 1000
A06	Inorganic microfibre 6 µ	
A10	Inorganic microfibre 10 µ	
A16	Inorganic microfibre 16 µ	
A25	Inorganic microfibre 25 µ	
M25	Wire mesh 25 µ	Nominal Filtration Metal mesh

7 - Max filter element differential pressure

N	Δp 20 bar
R	Δp 20 bar (filter with reverse flow + bypass)
H	Δp 210 bar
S	Δp 210 bar (filter with reverse flow)

8 - Option

a - Filter

P01	MP Filtri standard
P02	Maintenance from housing base (only for FHP 320 - 4)
Pxx	Customer request

b - Filter element

P01	MP Filtri standard
Pxx	Customer request

* Indicator plug:

Phosphated Steel plug T2 has to be ordered separately.

Code

T2H	Seal NBR
T2V	Seal FPM

MP Filtri - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

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Filter assembly	1	2	3	4	5	6	7	8a
FHP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: FHP	500	4	B	A	G1	A10	N	P01

Filter element	1	2	6	4	7	8b
HP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: HP	500	4	A10	A	N	P01

1 - Style

Filter	Filter element
<input type="checkbox"/> 500	<input type="checkbox"/> 500

2 - Filter length

<input type="checkbox"/> 500	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
-------------------------------------	-----------------------------------	-----------------------------------	-----------------------------------	-----------------------------------	-----------------------------------

3 - Valves

<input type="checkbox"/> S	Without bypass
<input type="checkbox"/> B	With bypass
<input type="checkbox"/> T	Without bypass + check valve*
<input type="checkbox"/> D	With bypass + check valve*
<input type="checkbox"/> V	With reverse flow*
<input type="checkbox"/> Z	With reverse flow + bypass*

*Reduced cross-section oilways

4 - Filter seals

<input type="checkbox"/> A	NBR
<input type="checkbox"/> V	FPM
<input type="checkbox"/>	On request

5 - Connections

Threaded

Type	Size
G1	G 1 1/2"
G2	1 1/2" NPT
G3	SAE 24 - 1 7/8" - 12 UN

Flanged

Type	Size
F1	1 1/2" SAE 3000 psi/M
F2	1 1/2" SAE 3000 psi/UNC
F3	2" SAE 3000 psi/M
F4	2" SAE 3000 psi/UNC
F5	1 1/2" SAE 6000 psi/M
F6	1 1/2" SAE 6000 psi/UNC
F7	2" SAE 6000 psi/M
F8	2" SAE 6000 psi/UNC

6 - Filter element

<input type="checkbox"/> A03	Inorganic microfibre 3 μ	} Absolute filtration Inorganic Microfibre βx (c) ≥ 1000
<input type="checkbox"/> A06	Inorganic microfibre 6 μ	
<input type="checkbox"/> A10	Inorganic microfibre 10 μ	
<input type="checkbox"/> A16	Inorganic microfibre 16 μ	
<input type="checkbox"/> A25	Inorganic microfibre 25 μ	
<input type="checkbox"/> M25	Wire mesh 25 μ	} Nominal Filtration Metal mesh

7 - Max filter element differential pressure

<input type="checkbox"/> N	Δp 20 bar
<input type="checkbox"/> S	Δp 210 bar

8 - Option

a - Filter

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> P02	MP with replacement of the filter element from the cap (only length 4 - 5)
<input type="checkbox"/> P03	Oil drain plug (only length 1 - 2 / standard for length 3 - 4 - 5)
<input type="checkbox"/> Pxx	Customer request

b - Filter element

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> Pxx	Customer request

*** Indicator plug:**

Phosphated Steel plug T2 has to be ordered separately.

Code

<input type="checkbox"/> T2H	Seal NBR
<input type="checkbox"/> T2V	Seal FPM

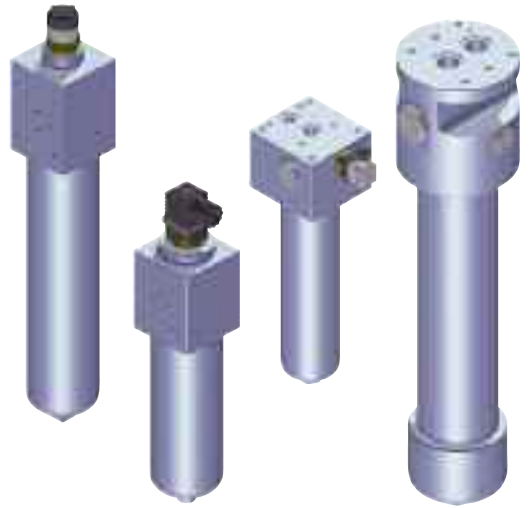
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FHM



Maximum pressure 320 bar
Flow rates to 450 l/min



Technical data

Filter housing (Materials)

- Head: Cast iron (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: Steel
- Check valve: Steel

Pressure

- Working pressure: 320 bar (32 MPa)
- Test pressure: 480 bar (48 MPa)
- Burst pressure: 960 bar (96 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 320 bar (32 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar \pm 10%
- Other opening pressures on request.

Δp Elements type

- Microfibre filter elements series N: 20 bar
- Microfibre filter elements series H: 210 bar (excluded FHM 050 - 500)
- Microfibre filter elements series S: 210 bar (only for FHM 050 - 500)
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

Seals

- Standard NBR series A
- Optional FPM series V

FHM FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	1	2	3	4	5
• FHM 006	2.17	-	-	-	-
• FHM 007	-	4.74	5.95	-	-
• FHM 010	-	4.74	5.95	-	-
• FHM 050	5.31	5.68	6.09	6.56	7.74
• FHM 065	5.47	5.83	7.04	-	-
• FHM 135	8.78	10.38	11.43	-	-
• FHM 320	19.8	21.93	24.22	26.70	-
• FHM 500	35	39.17	42.69	54.70	60.50

Volumes (dm³)

Length	1	2	3	4	5
• FHM 006	0.12	-	-	-	-
• FHM 007	-	0.30	0.50	-	-
• FHM 010	-	0.30	0.50	-	-
• FHM 050	0.29	0.38	0.48	0.60	0.89
• FHM 065	0.27	0.34	0.56	-	-
• FHM 135	0.49	0.82	1.03	-	-
• FHM 320	1.04	1.76	2.53	3.36	-
• FHM 500	1.63	2.35	2.96	5.11	6.44

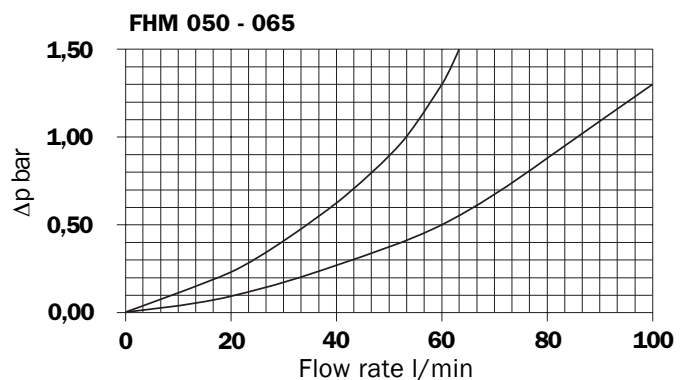
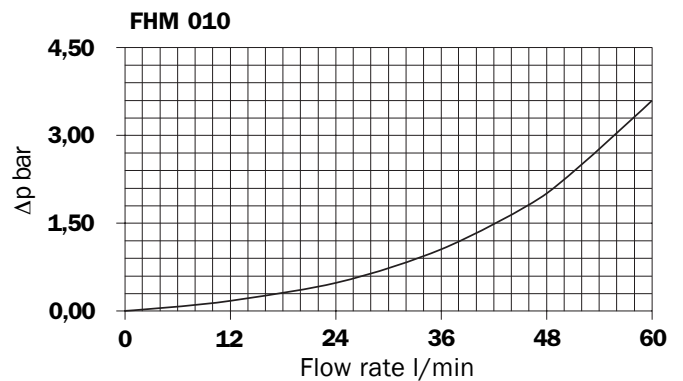
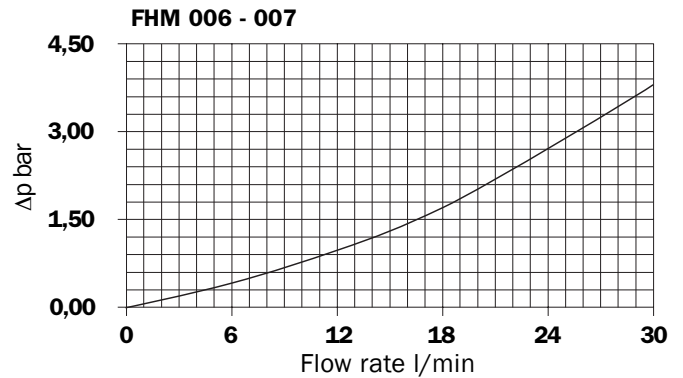
Connections

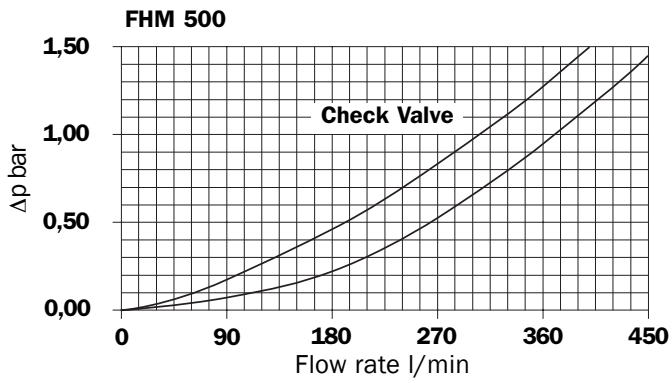
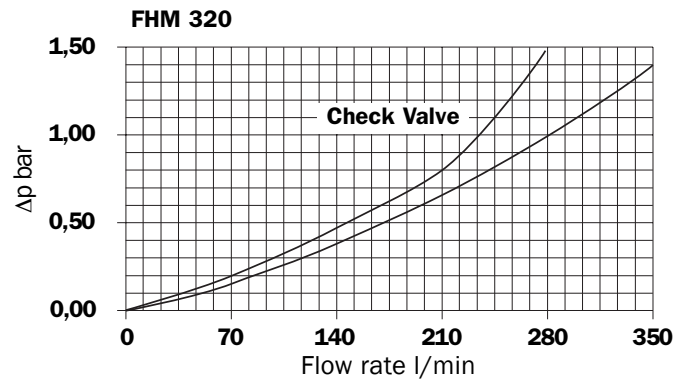
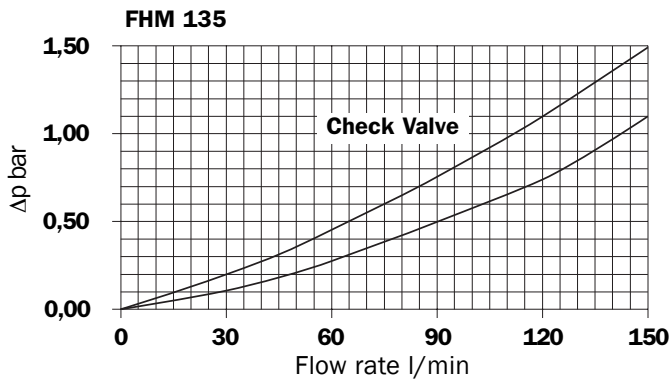
- FHM: In-line Inlet/Outlet

Filter housings Δp pressure drop

The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

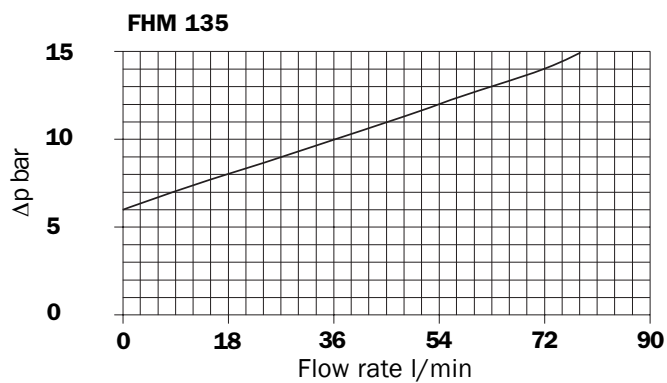
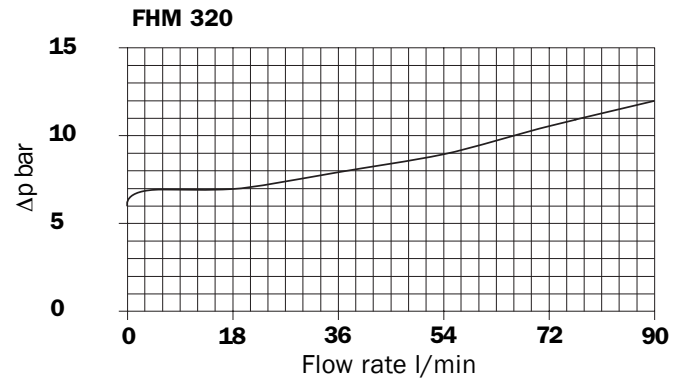
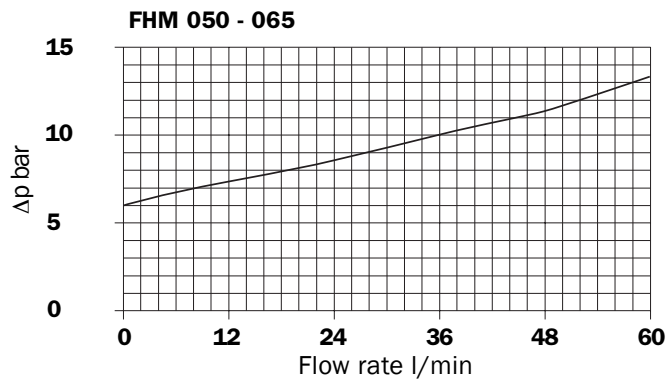
Δp varies proportionally with density.





Valves

Bypass valve pressure drop



Recommended maximum flow rate

- Pressure drop of filter assembly equal to Δp 1,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.

Filtration

	Length	A03	A06	A10	A16	A25
FHM 007	2	12	13	14	15	16
	3	13	14	15	16	17

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHM 050	1	38	39	65	67	80	100
	2	46	50	68	75	88	102
	3	56	58	75	80	93	103
	4	67	70	84	85	95	104
	5	81	82	93	95	100	105

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHM 065	1	23	30	47	53	71	102
	2	30	44	58	63	80	103
	3	51	59	78	82	92	105

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHM 135	1	60	65	98	104	130	149
	2	90	96	117	119	154	165
	3	118	119	143	145	156	167

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHM 320	1	111	121	187	217	252	310
	2	200	215	280	292	320	328
	3	245	267	311	320	325	332
	4	266	280	314	325	336	340

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHM 500	1	240	268	320	330	350	410
	2	275	298	345	350	375	420
	3	325	339	382	385	400	430
	4	348	370	395	400	410	440
	5	374	383	405	410	425	450

Serie N - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FHM 006	1	8	9	12	13	14

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FHM 010	2	19	21	27	28	31
	3	26	27	31	32	33

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FHM 050	1	28	36	50	52	62
	2	41	44	63	70	85
	3	51	53	71	77	90
	4	62	65	80	81	92
	5	73	74	83	88	97

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FHM 065	1	22	23	43	50	67
	2	30	34	56	62	75
	3	51	57	76	81	91

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FHM 135	1	45	51	83	85	122
	2	78	91	109	110	134
	3	102	111	130	136	146

Serie H - Flow rate l/min

Filtration

	Length	A03	A06	A10	A16	A25
FHM 320	1	97	102	156	162	228
	2	162	181	236	240	282
	3	206	233	275	280	305
	4	232	246	280	284	310

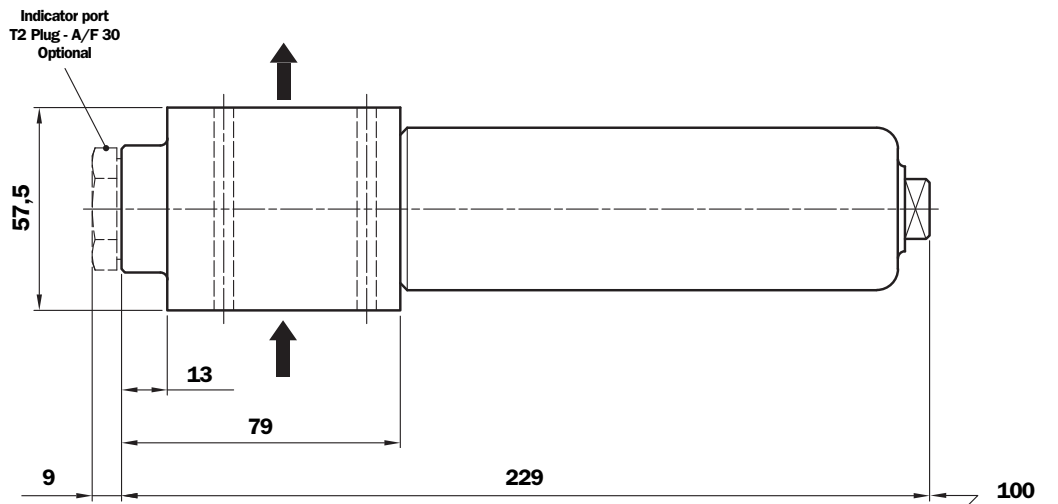
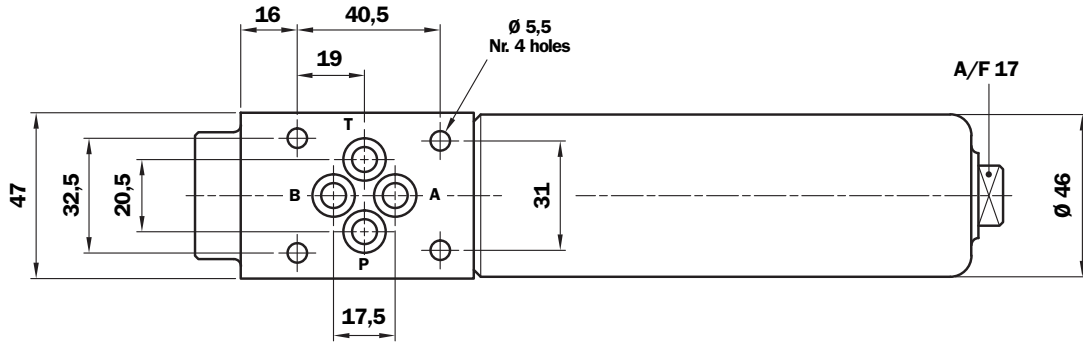
Serie H - Flow rate l/min

Filtration

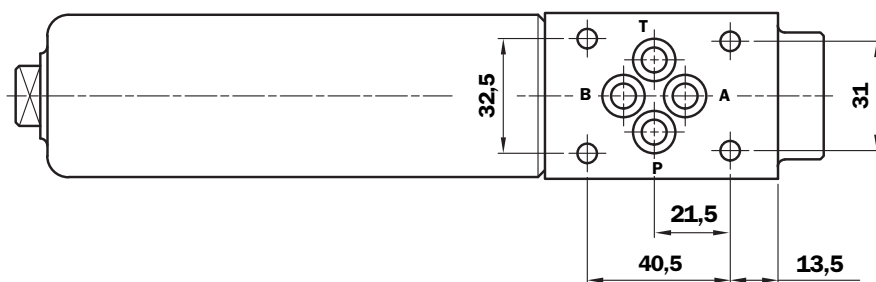
	Length	A03	A06	A10	A16	A25
FHM 500	1	140	150	238	240	300
	2	210	235	298	305	325
	3	258	265	325	330	360
	4	287	315	360	365	390
	5	340	347	385	390	410

Serie H - Flow rate l/min

G1 - Housing side "A"



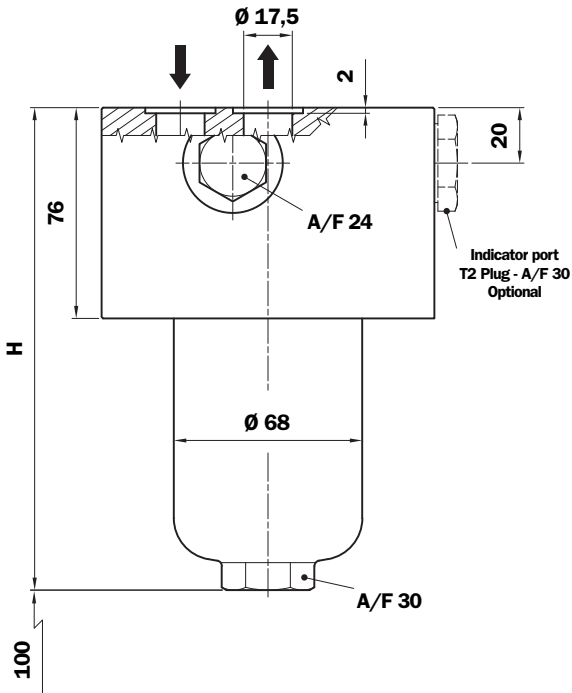
G2 - Housing side "B"



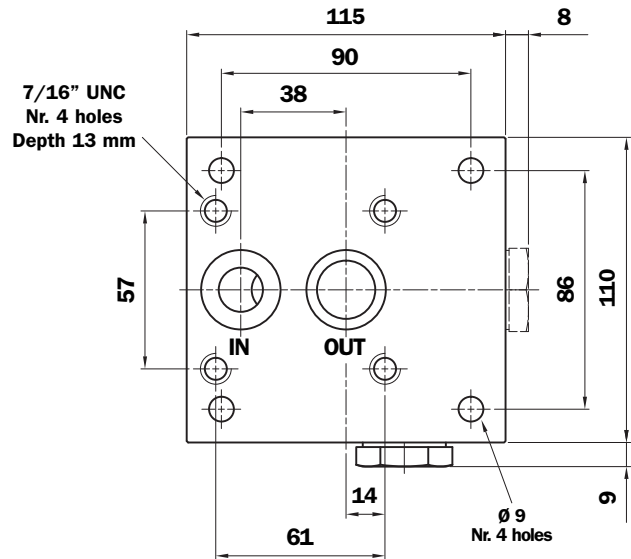
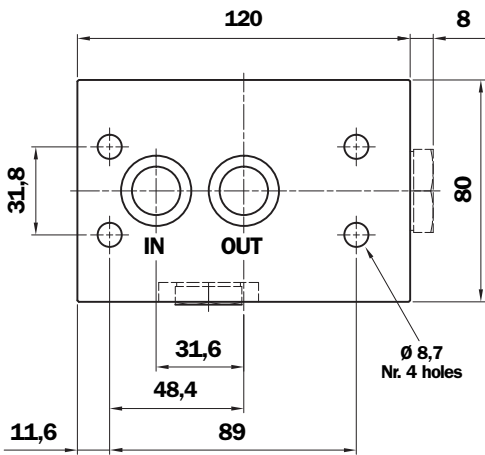
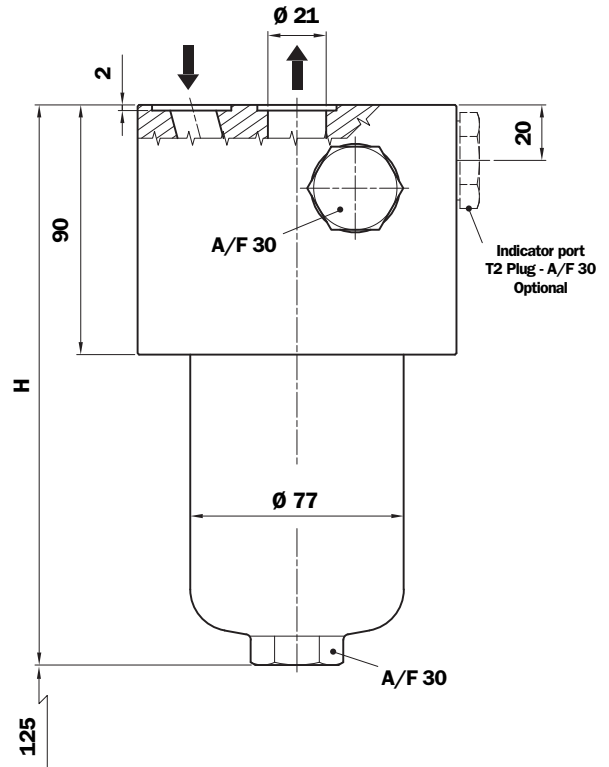
Manifold connections

Type	Size
G1	Housing side "A"
G2	Housing side "B"

FHM 050 - 065



FHM 135



FHM 050

Length Filter	H mm
1	154
2	191
3	233
4	281
5	403

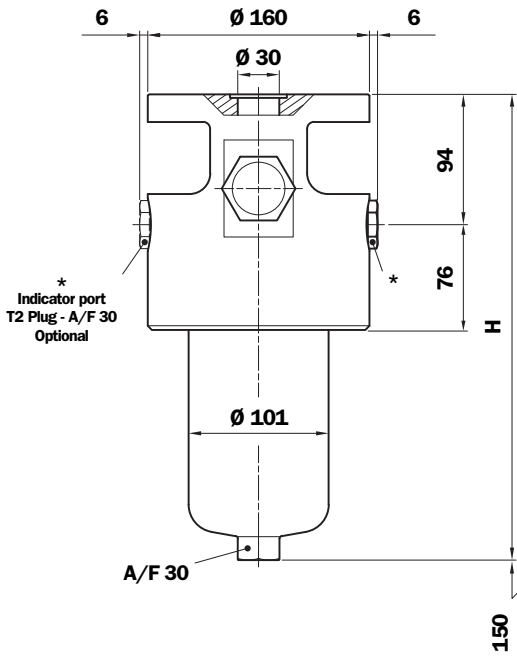
FHM 065

Length Filter	H mm
1	162
2	193
3	295

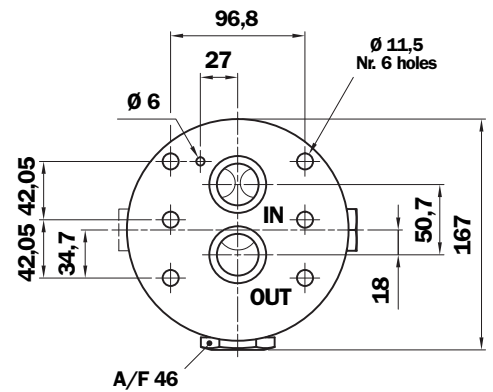
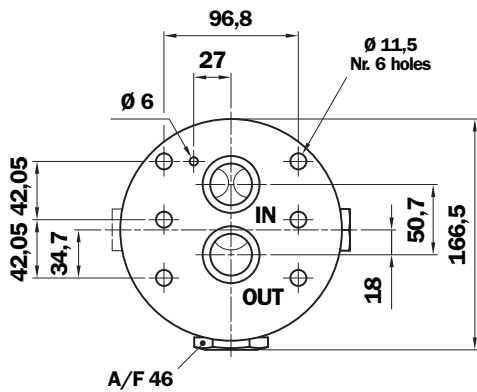
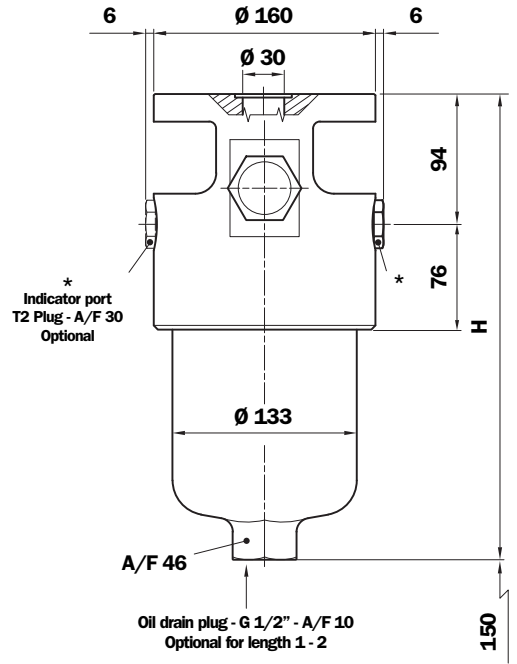
FHM 135

Length Filter	H mm
1	202
2	315
3	390

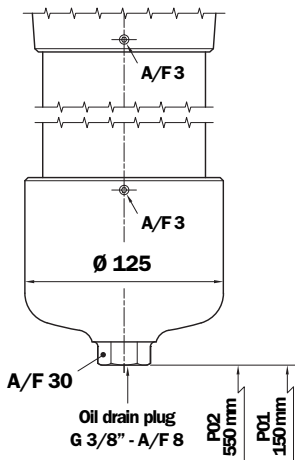
FHM 320



FHM 500

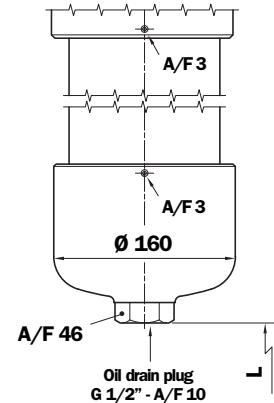


FHM 320 length 4



Style P01
Standard maintenance from head.
Style P02
Maintenance option from housing base.

FHM 500 length 4 - 5



FHM 320

Length Filter	H mm
1	293
2	416
3	548
4	702

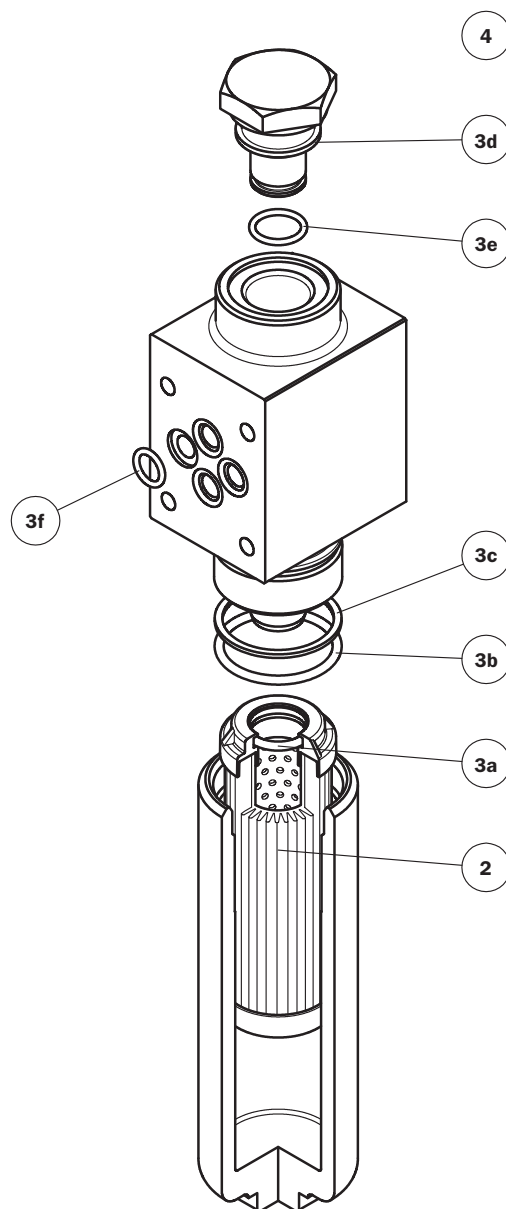


FHM 500

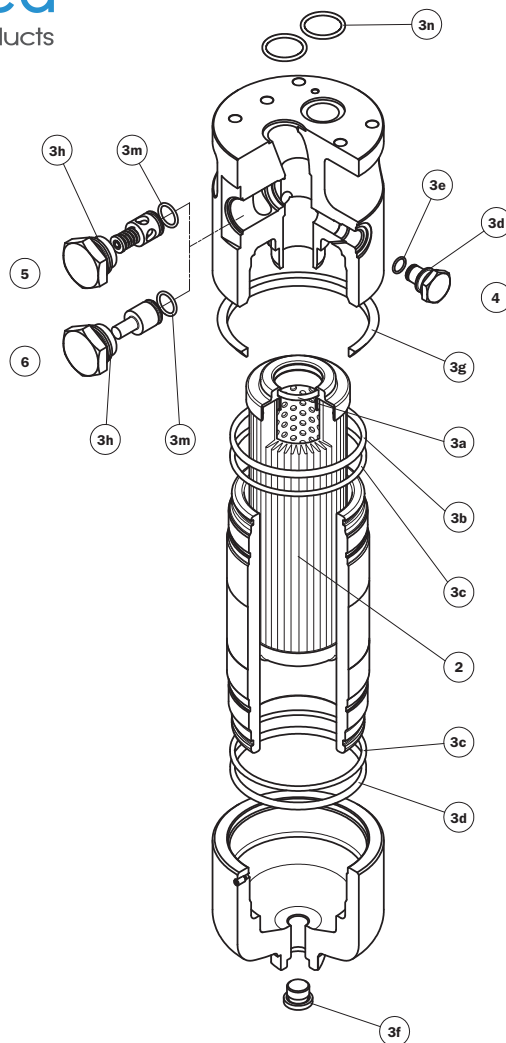
Length Filter	H mm
1	355
2	445
3	521
4	679
5	845

Style P01	
Filter length	L (mm)
4-5	150

Style P02	
Filter length	L (mm)
4	480
5	650



Item	Description	Q.ty	FILTER Series					
			FHM 006		FHM 007		FHM 010	
1	Filter assembly	1	See order table					
2	Filter element	1	See order table					
3	Seal Kit	1	NBR 02050324	FPM 02050325	NBR 02050600	FPM 02050601	NBR 02050320	FPM 02050321
3a	Filter element seal	1	O-R 121 Ø 15,88 x 2,62		O-R 4100 Ø 24,99 x 3,53		O-R 4100 Ø 24,99 x 3,53	
3b	Bowl seal	1	O-R 3125 Ø 31,22 x 2,62		O-R 3187 Ø 47,29 x 2,62		O-R 3187 Ø 47,29 x 2,62	
3c	Bowl anti-extrusion ring	1	Parbak 124 Ø 32,21 x 2,18		Parbak 134 Ø 48,08 x 2,18		Parbak 134 Ø 48,08 x 2,18	
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78	
3f	Head seal	1	4 pcs	O-R 108 Ø 8,73 x 1,78	4 pcs	O-R 108 Ø 8,73 x 1,78	5 pcs	O-R 2050 Ø 12,42 x 1,78
4	Indicator connection plug	1	T2H	T2V	T2H	T2V	T2H	T2V



Item	Description	Q.ty	FILTER Series									
			FHM 050		FHM 065		FHM 135		FHM 320		FHM 500	
1	Filter assembly	1	See order table									
2	Filter element	1	See order table									
3	Seal kit	1	NBR 02050410	FPM 02050411	NBR 02050268	FPM 02050279	NBR 02050271	FPM 02050282	NBR 02050275	FPM 02050286	NBR 02050332	FPM 02050333
3a	Filter element seal	1	O-R 3093 Ø 23,67 x 2,62		O-R 4100 Ø 24,99 x 3,53		O-R 3106 Ø 26,65 x 2,62		O-R 144 Ø 39,69 x 3,53		O-R 153 Ø 49,21 x 3,53	
3b	Bowl seal	1	O-R 3225 Ø 56,82 x 2,62		O-R 159 Ø 55,56 x 3,53		O-R 3256 Ø 64,77 x 2,62		2 pcs.	O-R 3350 Ø 88,57 x 2,62	2 pcs.	O-R 4462 Ø 117,10 x 3,53
3c	Bowl anti-extrusion ring	1	Parbak 139 Ø 56,03 x 2,18		Parbak 227 Ø 54,53 x 3		Parbak 144 Ø 63,96 x 2,18		2 pcs.	Parbak 153 Ø 89,36 x 2,18	2 pcs.	Parbak 247 Ø 117,63 x 3
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78	
3f	Drain plug	1	-		-		-		G 3/8" with bonded seal		G 1/2" with bonded seal	
3g	Protective seal	1	01026521		01026521		01026509		01026510		-	
3h	Bp or no Bp O-Ring	1	O-R 121 (90 Sh A) Ø 15,88 x 2,62		O-R 121 (90 Sh A) Ø 15,88 x 2,62		O-R 3087 (90 Sh A) Ø 21,89 x 2,62		O-R 3143 (90 Sh A) Ø 36,14 x 2,62		O-R 3143 (90 Sh A) Ø 36,14 x 2,62	
3m	Bp or no Bp O-Ring	1	O-R 2031 Ø 7,66 x 1,78		O-R 2031 Ø 7,66 x 1,78		O-R 2037 Ø 9,25 x 1,78		O-R 3106 Ø 26,65 x 2,62		O-R 3106 Ø 26,65 x 2,62	
3n	Protective seal	2	O-R 3081 Ø 20,24 x 2,62		O-R 3081 Ø 20,24 x 2,628		O-R 3093 Ø 23,67 x 2,62		O-R 4137 Ø 34,52 x 3,53		O-R 4137 Ø 34,52 x 3,53	
4	Indicator connection plug	1	T2H	T2V	T2H	T2V	T2H	T2V	T2H	T2V	T2H	T2V
5	Bypass assembly	1	NBR 02001400	FPM 02001401	NBR 02001400	FPM 02001401	NBR 02001404	FPM 02001405	NBR 02001408	FPM 02001409	NBR 02001408	FPM 02001409
6	Non-Bypass assembly	1	NBR 02001402	FPM 02001403	NBR 02001402	FPM 02001403	NBR 02001406	FPM 02001407	NBR 02001410	FPM 02001411	NBR 02001410	FPM 02001411

Filter assembly	1	2	3	4	5	6	7	8a
FHM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Example: FHM **050** **1** **S** **A** **F1** **A03** **S** **P01**

Filter element	1	2	6	4	7	8b
HP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Example: HP **050** **1** **A03** **A** **S** **P01**

1 - Style

Filter	Filter element
006	⌘ See below
007	065
010	065
050	050
065	065
135	135
320	320
500	500

2 - Filter length

006	1				
007		2	3		
010		2	3		
050	1	2	3	4	5
065	1	2	3		
135	1	2	3		
320	1	2	3	4	
500	1	2	3	4	5

3 - Valves

S	Without bypass
B	With bypass
T	Without bypass + check valve*
D	With bypass + check valve*

*Reduced cross-section oilways

N.B. Style 006 - 007 - 010 are available only in "S" version without bypass.

4 - Filter seals

A	NBR
V	FPM
<input type="checkbox"/>	On request

5 - Connections

Manifold

Type	Size FHM 006 - 007 - 010
G1	Housing side "A"
G2	Housing side "B"

Type	Size FHM 050 - 065 - 135 - 320 - 500
F1	-

6 - Filter element

A03	Inorganic microfibre 3 µ	Absolute filtration Inorganic Microfibre βx(c) ≥ 1000
A06	Inorganic microfibre 6 µ	
A10	Inorganic microfibre 10 µ	
A16	Inorganic microfibre 16 µ	
A25	Inorganic microfibre 25 µ	
M25	Wire mesh 25 µ	Nominal Filtration Metal mesh

7 - Max filter element differential pressure

N	Δp 20 bar (excluded FHM 006 - 007 - 010)
H	Δp 210 bar
S	Δp 210 bar (only for FHM 050 - 500)

8 - Option

a - Filter

P01	MP Filtri standard
P02	Maintenance from base of housing (only FHM 320 length 4 - FHM 500 length 4/5)
Pxx	Customer request

b - Filter element

P01	MP Filtri standard
Pxx	Customer request

⌘ Filter element for FHM 006:

- HP 011 3 A03 x H P01
- HP 011 3 A06 x H P01
- HP 011 3 A10 x H P01
- HP 011 3 A16 x H P01
- HP 011 3 A26 x H P01
- HP 011 3 M25 x H P01

"x"= seal

A	NBR
V	FPM
<input type="checkbox"/>	On request

* Indicator plug

Phosphated Steel plug T2 has to be ordered separately.

Code

T2H	Seal NBR
T2V	Seal FPM

MP Filtri - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

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Maximum pressure 320 bar
Flow rates to 485 l/min



Technical data

Filter housing (Materials)

- Head: Cast iron (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: Steel
- Check valve: Steel

Pressure

- Working pressure: 320 bar (32 MPa)
- Test pressure: 480 bar (48 MPa)
- Burst pressure: 960 bar (96 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 320 bar (32 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar \pm 10%
- Other opening pressures on request.

Δp Elements type

- Microfibre filter elements series N: 20 bar
- Microfibre filter elements series H: 210 bar (excluded FHB 065 - 135 - 320)
- Microfibre filter elements series S: 210 bar (only for FHB 050)
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

Seals

- Standard NBR series A
- Optional FPM series V

FHB FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	1	2	3	4	5
• FHB050	2.61	2.98	3.39	3.86	5.04
• FHB065	3.33	3.69	4.90	-	-
• FHB135	6.61	8.21	9.21	-	-
• FHB320	12.95	15.08	17.37	26.77	-

Volumes (dm³)

Length	1	2	3	4	5
• FHB050	0.21	0.30	0.40	0.52	0.81
• FHB065	0.20	0.27	0.49	-	-
• FHB135	0.40	0.73	0.94	-	-
• FHB320	0.91	1.63	2.40	3.59	-

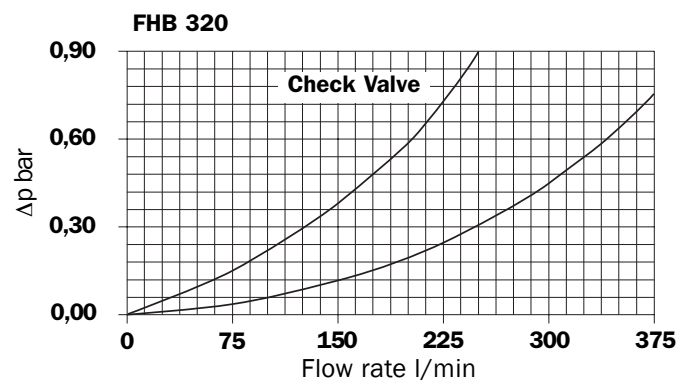
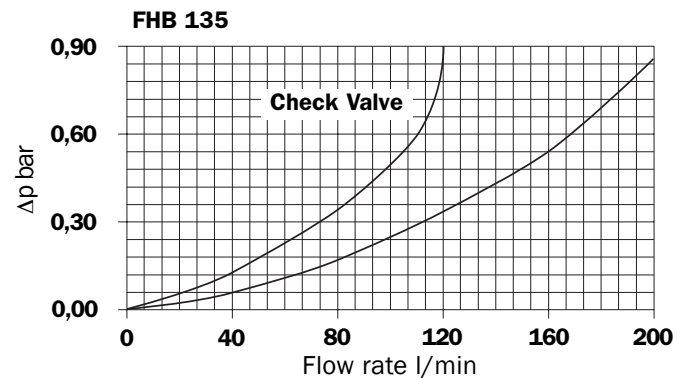
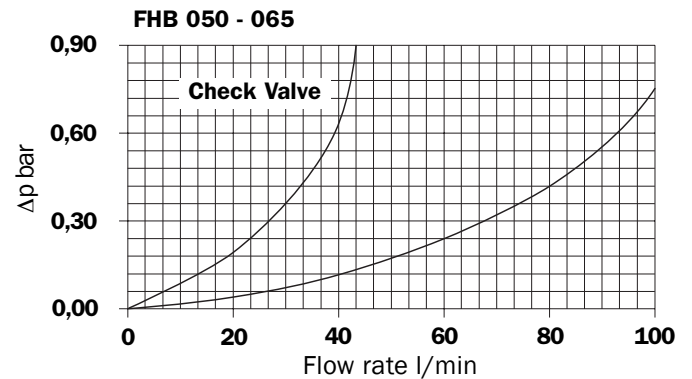
Connections

- FHB: Side manifold Inlet/Outlet

Filter housings Δp pressure drop

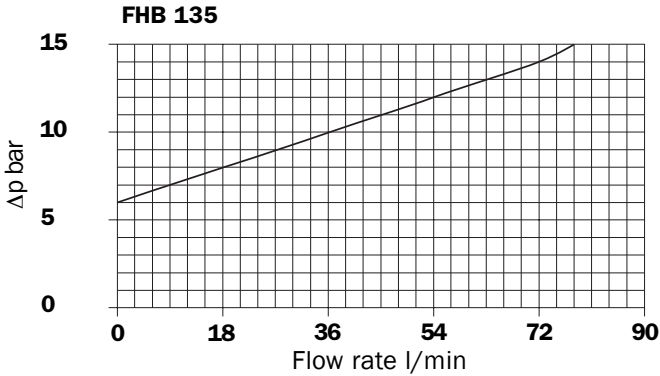
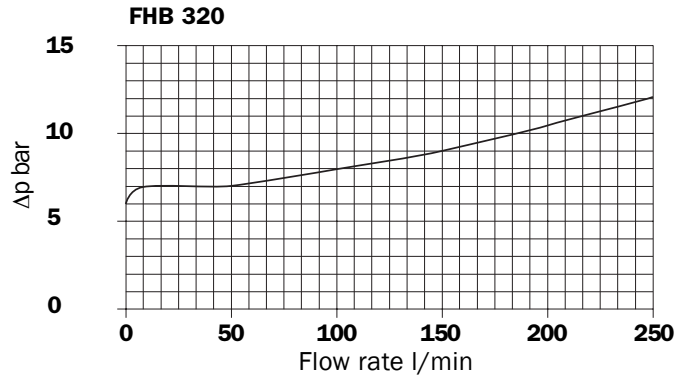
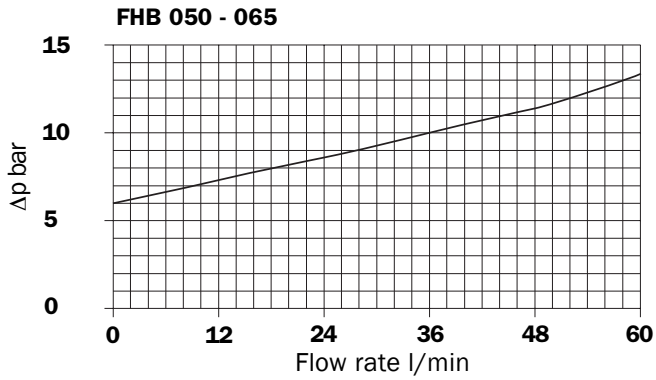
The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

Δp varies proportionally with density.



Valves

Bypass valve pressure drop



Recommended maximum flow rate

- Pressure drop of filter assembly equal to Δp 1,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.

		Filtration						
		Length	A03	A06	A10	A16	A25	M25
FHB 050	1	42	44	78	80	100	130	
	2	53	58	83	93	112	132	
	3	65	69	93	100	118	133	
	4	82	86	105	108	122	134	
	5	102	104	119	122	127	136	

Serie N - Flow rate l/min

		Filtration					
		Length	A03	A06	A10	A16	A25
FHB 050	1	30	40	58	60	74	
	2	46	50	75	85	107	
	3	59	62	87	95	115	
	4	74	79	100	102	118	
	5	90	92	105	112	125	

Serie H - Flow rate l/min

		Filtration						
		Length	A03	A06	A10	A16	A25	M25
FHB 065	1	25	32	55	62	87	90	
	2	33	50	70	76	100	105	
	3	60	70	96	103	117	120	

Serie N - Flow rate l/min

		Filtration					
		Length	A03	A06	A10	A16	A25
FHB 065	1	23	25	49	57	80	
	2	32	38	66	75	94	
	3	59	68	95	100	115	

Serie H - Flow rate l/min

		Filtration						
		Length	A03	A06	A10	A16	A25	M25
FHB 135	1	67	72	119	129	176	200	
	2	109	116	152	154	224	230	
	3	153	155	200	205	226	235	

Serie N - Flow rate l/min

		Filtration					
		Length	A03	A06	A10	A16	A25
FHB 135	1	48	55	97	100	159	
	2	90	110	137	140	182	
	3	126	141	175	187	206	

Serie H - Flow rate l/min

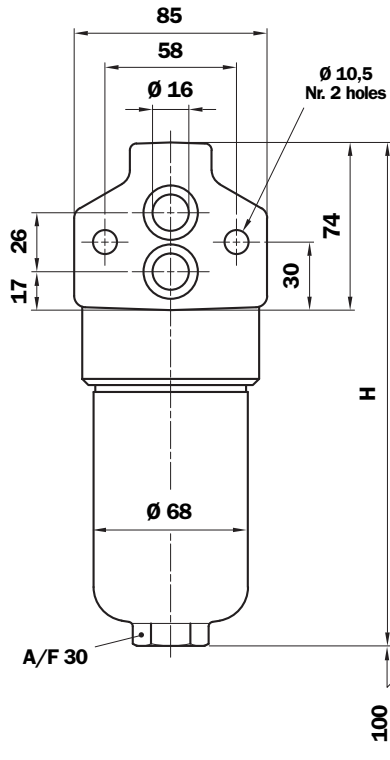
		Filtration						
		Length	A03	A06	A10	A16	A25	M25
FHB 320	1	130	143	238	285	340	440	
	2	259	282	390	408	450	465	
	3	330	368	440	450	460	475	
	4	367	390	445	463	480	485	

Serie N - Flow rate l/min

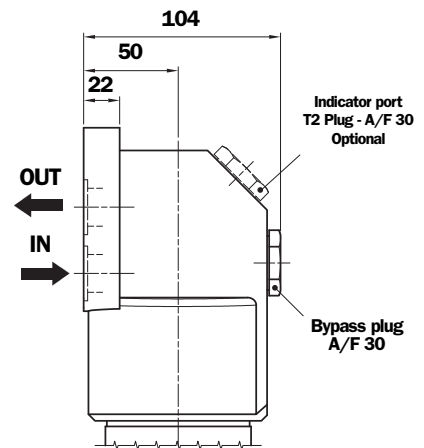
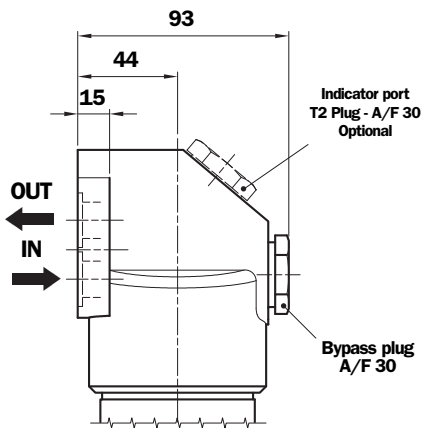
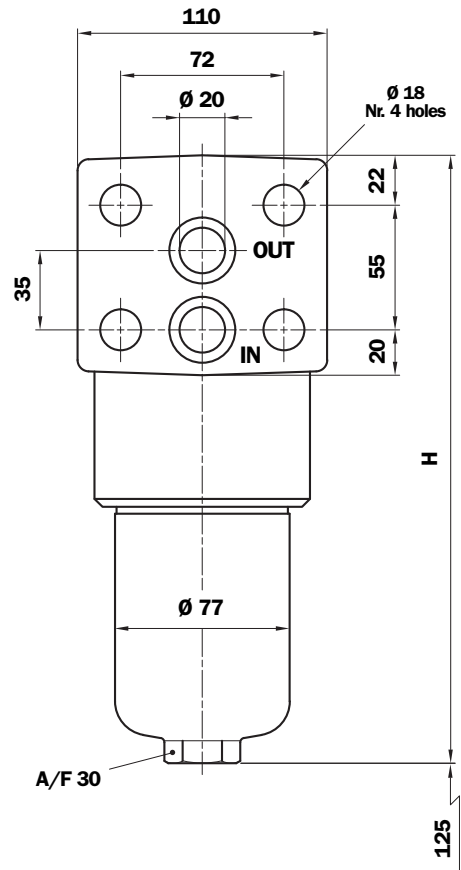
		Filtration					
		Length	A03	A06	A10	A16	A25
FHB 320	1	110	117	191	200	300	
	2	200	230	318	325	390	
	3	268	312	379	387	430	
	4	310	332	387	392	435	

Serie H - Flow rate l/min

FHB 050 - 065



FHB 135



FHB 050

Length Filter	H mm
1	185
2	222
3	264
4	312
5	434

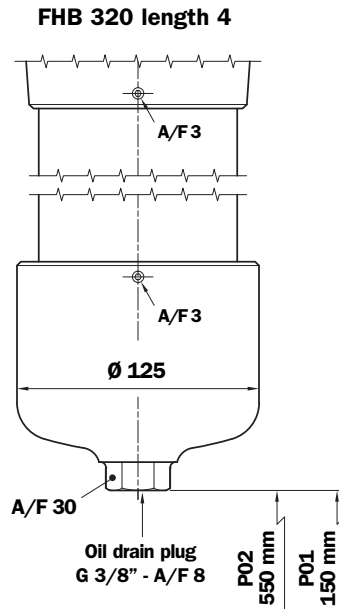
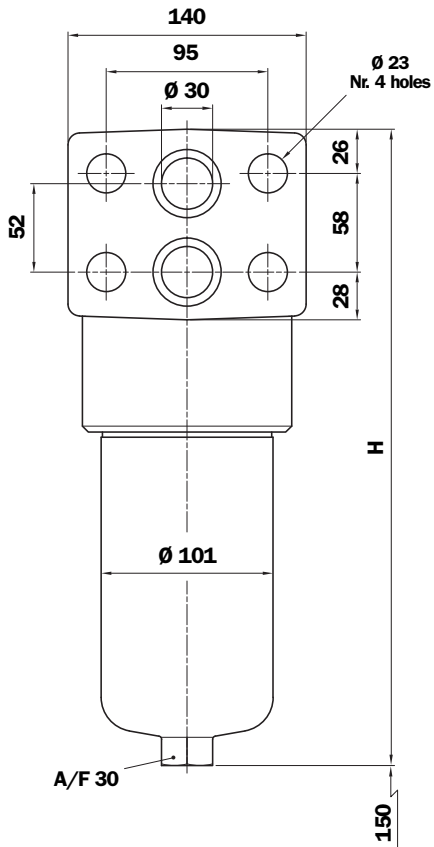
FHB 065

Length Filter	H mm
1	194
2	225
3	327

FHB 135

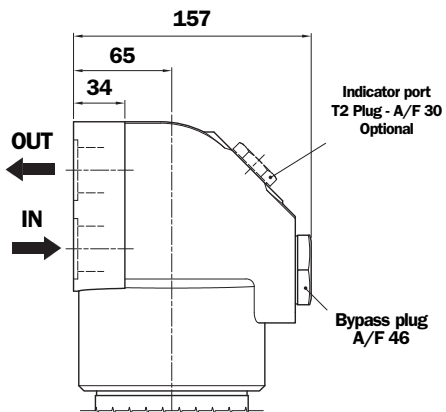
Length Filter	H mm
1	268
2	381
3	456

FHB 320



Style P01
Standard maintenance from head.

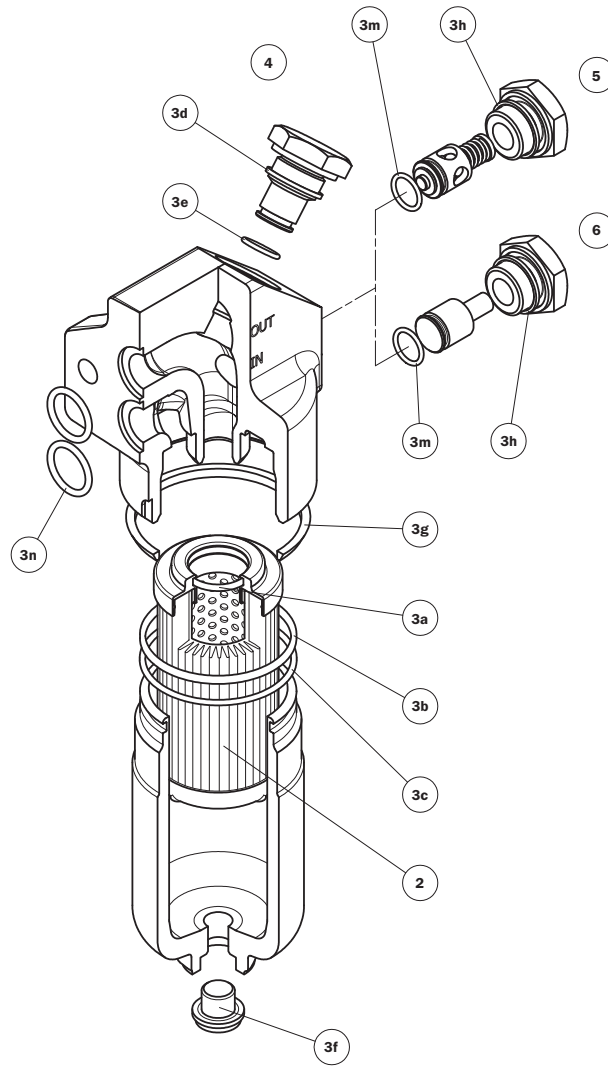
Style P02
Maintenance option from housing base.



FHB 320

Length Filter	H mm
1	301
2	424
3	556
4	709

Spare parts



Item	Description	Q.ty	FILTER Series							
			FHB 050		FHB 065		FHB 135		FHB 320	
1	Filter assembly	1	See order table							
2	Filter element	1	See order table							
3	Seal Kit	1	NBR 02050412	FPM 02050413	NBR 02050266	FPM 02050277	NBR 02050270	FPM 02050281	NBR 02050273	FPM 02050284
3a	Filter element seal	1	O-R 3093 Ø 23,67 x 2,62		O-R 4100 Ø 24,99 x 3,53		O-R 3106 Ø 26,65 x 2,62		O-R 144 Ø 39,69 x 3,53	
3b	Bowl seal	1	O-R 3225 Ø 56,82 x 2,62		O-R 159 Ø 55,56 x 3,53		O-R 3256 Ø 64,77 x 2,62		2 pcs	O-R 3350 Ø 88,57 x 2,62
3c	Bowl anti-extrusion ring	1	Parbak 139 Ø 56,03 x 2,18		Parbak 277 Ø 54,53 x 3		Parbak 144 Ø 63,96 x 2,18		2 pcs	Parbak 153 Ø 89,36 x 2,18
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78	
3f	Drain plug	1	G 1/4" with bonded seal		G 1/4" with bonded seal		G 1/4" with bonded seal		G 1/8" with bonded seal	
3g	Protective seal	1	01026521		01026521		01026509		01026510	
3h	Bp or Non-Bp seal	1	Bonded seal G 1/2"		Bonded seal G 1/2"		Bonded seal G 1/2"		O-R 3143 (90 Sh A) Ø 36,14 x 2,62	
3m	Bp or Non-Bp seal	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 3106 Ø 26,65 x 2,62	
3n	Head seal	2	O-R 3075 Ø 18,72 x 2,62		O-R 3075 Ø 18,72 x 2,62		O-R 3093 Ø 23,67 x 2,62		O-R 4131 Ø 32,92 x 3,53	
4	Indicator connection plug	1	T2H	T2V	T2H	T2V	T2H	T2V	T2H	T2V
5	Bypass assembly	1	NBR 02001312	FPM 02001385	NBR 02001312	FPM 02001385	NBR 02001312	FPM 02001385	NBR 02001381	FPM 02001382
6	Non-bypass assembly	1	NBR 02001314	FPM 02001386	NBR 02001314	FPM 02001386	NBR 02001314	FPM 02001386	NBR 02001383	FPM 02001384

Filter assembly

FHB

Example: FHB

	1	2	3	4	5	6	7a
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	065	2	B	A	F1	A10	N
					F1		P01

Filter element

HP

Example: HP

	1	2	5	4	6	7b
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	065	2	A10	A	N	P01

1 - Style

Filter	Filter element
050	050
065	065
135	135
320	320

5 - Filter element

A03	Inorganic microfibre 3 μ	} Absolute filtration Inorganic Microfibre } $\beta_x(c) \geq 1000$
A06	Inorganic microfibre 6 μ	
A10	Inorganic microfibre 10 μ	
A16	Inorganic microfibre 16 μ	
A25	Inorganic microfibre 25 μ	
M25	Wire mesh 25 μ	} Nominal Filtration Metal mesh

2 - Filter length

050	1	2	3	4	5
065	1	2	3		
135	1	2	3		
320	1	2	3	4	

6 - Max filter element differential pressure

N	Δp 20 bar
H	Δp 210 bar (only for FHB 065 - 135 - 320)
S	Δp 210 bar (only for FHB 050)

3 - Valves

S	Without bypass
B	With bypass
T	Without bypass + check valve*
D	With bypass + check valve*

*Reduced cross-section oilways

7 - Option

a - Filter

P01	MP Filtri standard
P02	Maintenance from base of housing (only FHB 320 length 4)
Pxx	Customer request

b - Filter element

P01	MP Filtri standard
Pxx	Customer request

4 - Filter seals

A	NBR
V	FPM
<input type="text"/>	On request

*** Indicator plug:**

Phosphated Steel plug T2 has to be ordered separately.

Code

T2H	Seal NBR
T2V	Seal FPM

FHF 325

**Filter housing in according to
SAE J2066 for HF4 filter elements**

**Maximum pressure 350 bar
Flow rates to 500 l/min**



Technical data

Filter housing (Materials)

- Head: Cast iron (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Cover: Cast iron (chemical heat treatment)
- Bypass valve: Brass - Steel

Pressure

- Working pressure: 350 bar (35 MPa)
- Test pressure: 525 bar (52.5 MPa)
- Burst pressure: 1050 bar (105 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 350 bar (35 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar \pm 10%
- Other opening pressures on request.

Δp Elements type

- Microfibre filter elements series N: 20 bar
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN.

Seals

- Standard NBR series A
- Optional FPM series V

FHF FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	1	2	3
• FHF325	23.90	32.68	41.47

Volumes (dm³)

Length	1	2	3
• FHF325	3.50	5.80	8.11

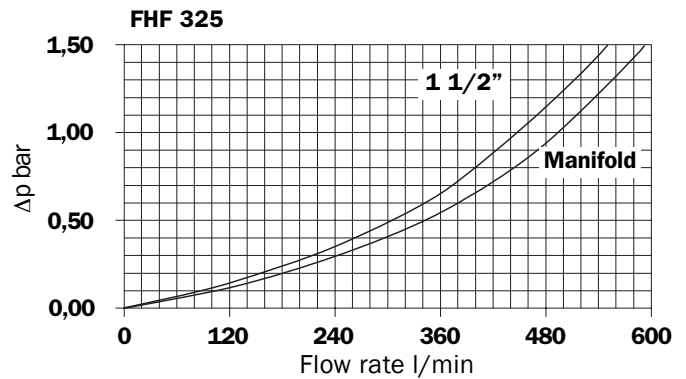
Connections

- FHF 325: In-line threaded connection
- FHF 325: In-line flanged connection
- FHF 325: Manifold connection

Filter housings Δp pressure drop

The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

Δp varies proportionally with density.



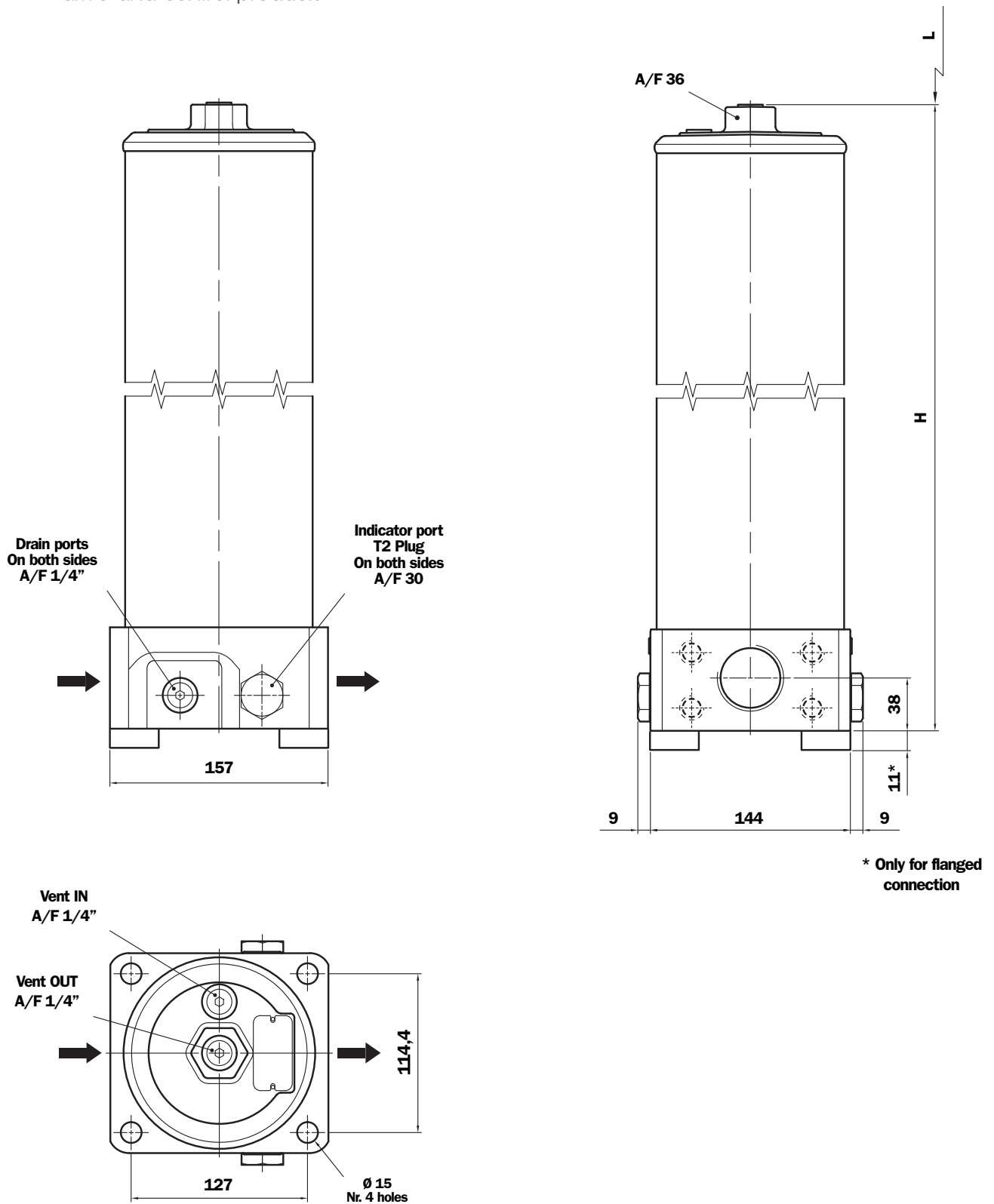
Recommended maximum flow rate

- Pressure drop of filter assembly equal to Δp 1,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.
- Connections of filter under test to Manifold.

FHF 325	Length	Filtration					
		A03	A06	A10	A16	A25	M25
	1	300	335	348	415	490	495
	2	395	420	430	450	495	500
	3	410	440	455	465	500	505

Serie N - Flow rate l/min

FHF 325 - Threaded and Flanged connection



FHF 325

Length Filter	H mm	L mm
1	452	250
2	690	485
3	928	725

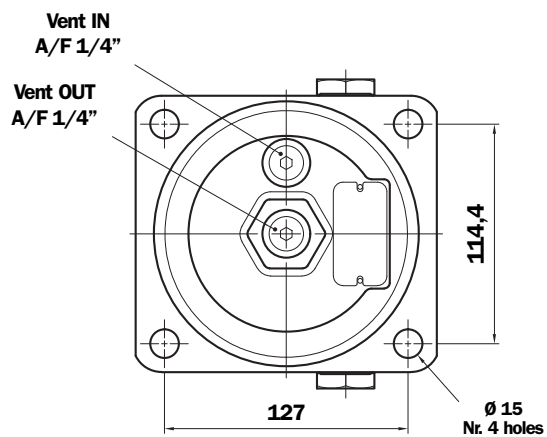
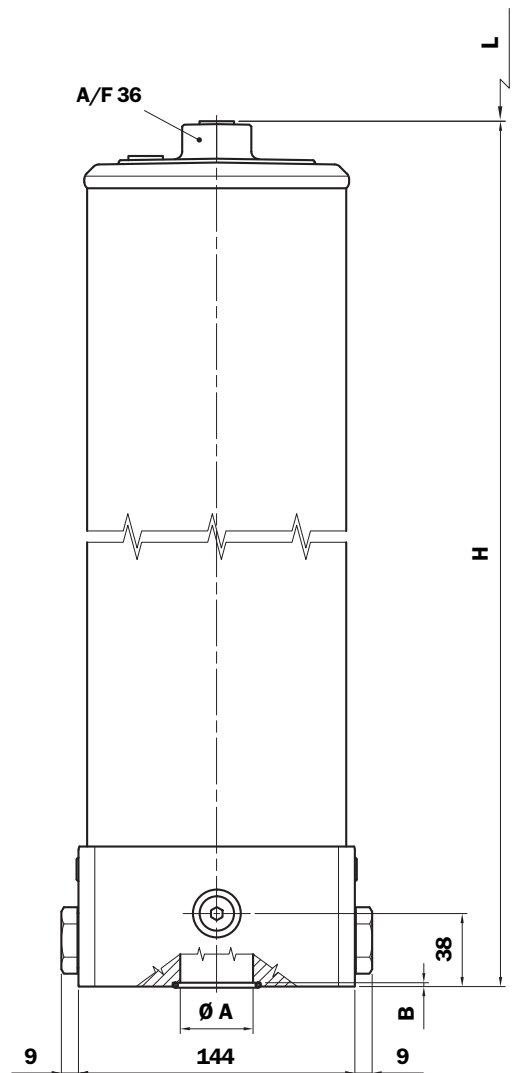
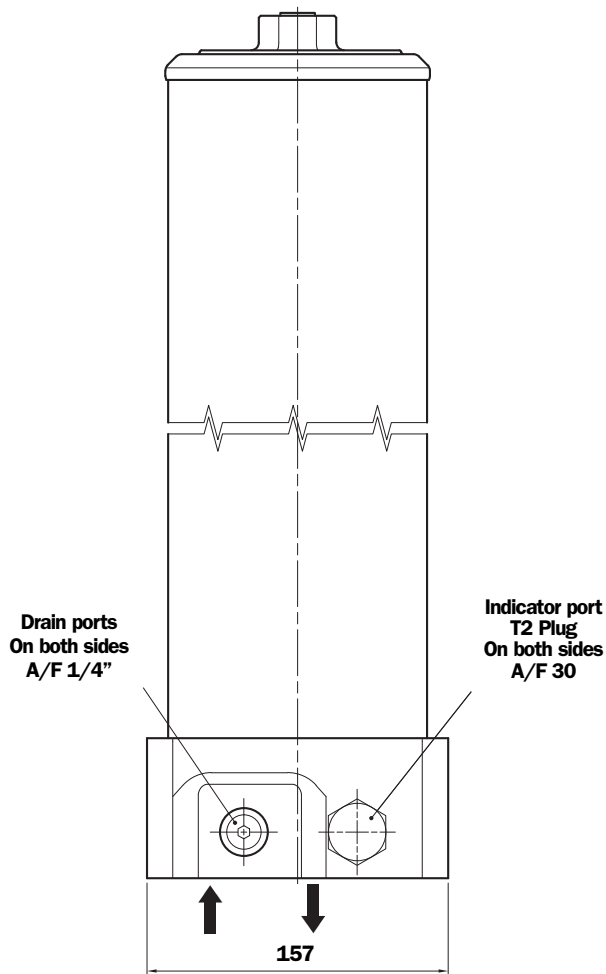
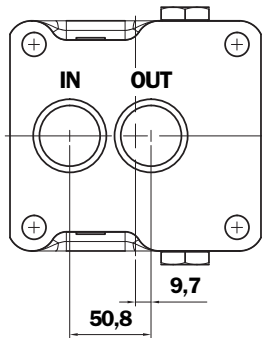
Thread connections

Type	Size
A	G 1 1/2"
B	1 1/2" NPT
C	SAE 24 - 1 7/8" - 12 UN

Flanged connections

Type	Size
G	1 1/2" SAE - 6000 psi/M
H	1 1/2" SAE - 6000 psi/UNC

FHF 325 - Manifold connection

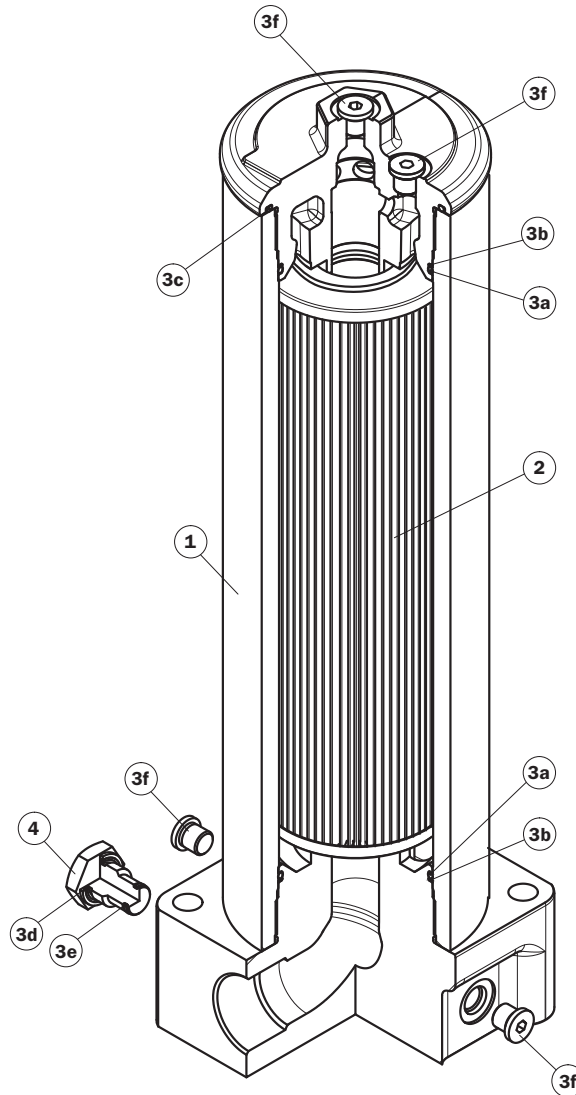


FHF 325

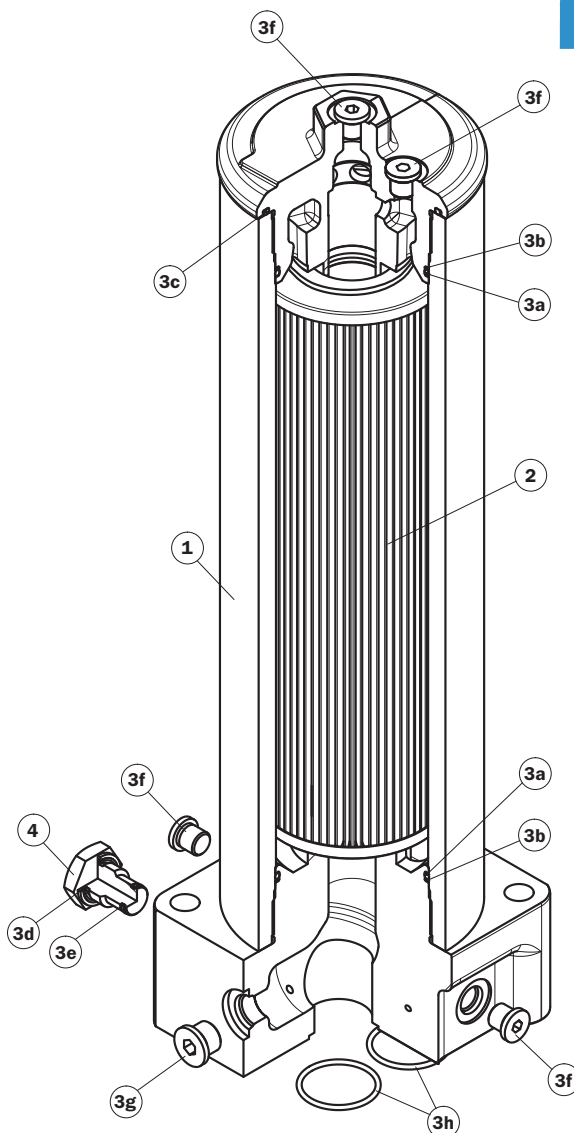
Length Filter	H mm	L mm
1	452	250
2	690	485
3	928	725

Manifold connections

Type	A	B
M	1,38"	2
N	1,50"	2



Item	Description	Q.ty	FILTER Series	
			FHF 325 A - B - C - G - H	
1	Filter assembly	1	See order table	
2	Filter element	1	See order table	
3	Seal Kit	1	NBR 02050588	FPM 02050589
3a	O-Ring for housing	2	O-R 4412 Ø 104,4 x 3,53	
3b	Anti-extrusion ring	2	O-R SR 243 Ø 104,93 x 3	
3c	O-Ring cover	1	O-R 4475 Ø 120,2 x 3,53	
3d	Indicator seal	2	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	2	O-R 2050 Ø 12,42 x 1,78	
3f	Vent and drain plug	4	Plug 9/16 18 UNF	
4	Indicator connection plug	2	T2H	T2V



Item	Description	Q.ty	FILTER Series FHF 325 M - N	
1	Filter assembly	1	See order table	
2	Filter element	1	See order table	
3	Seal Kit	1	NBR 02050590	FPM 02050591
3a	O-Ring for housing	2	O-R 4412 Ø 104,4 x 3,53	
3b	Anti-extrusion ring	2	O-R SR 243 Ø 104,93 x 3	
3c	O-Ring cover	1	O-R 4475 Ø 120,2 x 3,53	
3d	Indicator seal	2	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	2	O-R 2050 Ø 12,42 x 1,78	
3f	Vent and drain plug	4	Plug 9/16 18 UNF	
3g	Plug	2	Plug 3/4 16 UNF	
3h	O-Ring Manifold connection (M)	2	O-Ring 3150 (Ø 37,77 x 2,62)	
	O-Ring Manifold connection (N)		O-Ring 3162 (Ø 40,95 x 2,62)	
4	Indicator connection plug	2	T2H	T2V

Filter assembly

FHF

Example: FHF

	1	2	3	4	5	6	7	8	9
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	325	2	B	A	A	7	A10	N	P01

Filter element

HF

Example: HF

	1	2	7	4	8	9
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	325	2	A10	A	N	P01

1 - Style

Filter

325

Filter element

325

2 - Filter length

325

1 **2** **3**

3 - Valves

- S** Without bypass
 B With bypass

4 - Filter seals

- A** NBR
 V FPM
 On request

5 - Connections

Threaded

Type	Size
A	G 1 1/2"
B	1 1/2" NPT
C	SAE 24 - 1 7/8" - 12 UN

Flanged

Type	Size
G	1 1/2" SAE - 6000 psi/M
H	1 1/2" SAE - 6000 psi/UNC

Manifold

Type	A	B
M	1,38"	2
N	1,50"	2

6 - Indicator port

7 With both plugged indicator ports

7 - Filter element

<input type="checkbox"/> A03	Inorganic microfibre 3 µ	} Absolute filtration Inorganic Microfibre βx (c) ≥ 1000
<input type="checkbox"/> A06	Inorganic microfibre 6 µ	
<input type="checkbox"/> A10	Inorganic microfibre 10 µ	
<input type="checkbox"/> A16	Inorganic microfibre 16 µ	
<input type="checkbox"/> A25	Inorganic microfibre 25 µ	
<input type="checkbox"/> M25	Wire mesh 25 µ	} Nominal Filtration Metal mesh

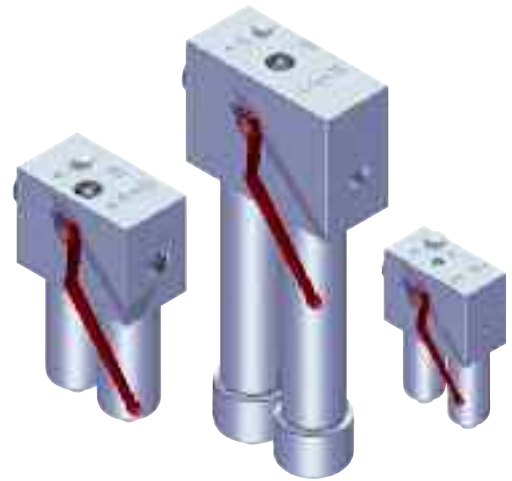
8 - Max filter element differential pressure

N Δp 20 bar

9 - Option

P01 MP Filtri standard
 Pxx Customer request

Maximum pressure 350 bar
Flow rates to 345 l/min



Technical data

Filter housing (Materials)

- Head: Cast iron (chemical heat treatment)
- Housing: Steel (chemical heat treatment)
- Bypass valve: Steel

Pressure

- Working pressure: 350 bar (35 MPa)
- Test pressure: 525 bar (52,5 MPa)
- Burst pressure: 1050 bar (105 MPa)
- Pulse pressure fatigue test: 1.000.000 cycles with pressure from 0 to 350 bar (35 MPa)

Temperature

- From -25 °C to +110 °C

Bypass valve

- Opening pressure 6 bar \pm 10%
- Other opening pressures on request.

Δp Elements type

- Microfibre filter elements series R: 20 bar
- Microfibre filter elements series H: 210 bar (only for FHD 021)
- Microfibre filter elements series S: 210 bar (excluded FHD 021)
- Wire mesh filter elements series N: 20 bar
- Fluid flow through the filter element from OUT to IN

Seals

- Standard NBR series A
- Optional FPM series V

FHD FILTERS ARE PROVIDED FOR VERTICAL MOUNTING

Weights (kg)

Length	1	2	3	4	5
• FHD021	-	6.66	7.15	-	-
• FHD051	13.41	13.78	14.19	14.66	-
• FHD326	36.35	39.48	10.77	-	-
• FHD333	-	64.48	66.77	69.25	-

Volumes (dm³)

Length	1	2	3	4	5
• FHD021	-	0.06	0.12	-	-
• FHD051	0.22	0.31	0.41	0.53	-
• FHD326	0.88	1.60	2.37	-	-
• FHD333	-	1.75	2.52	3.35	-

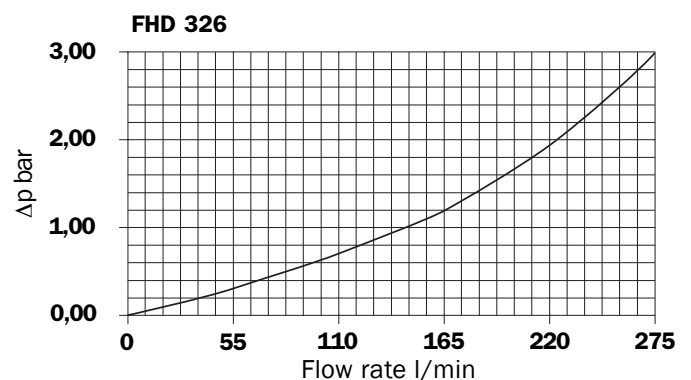
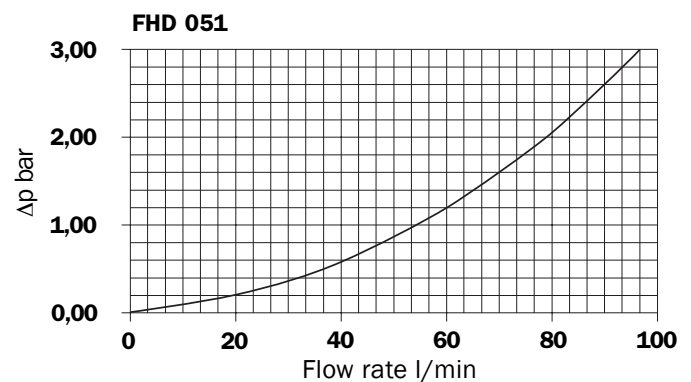
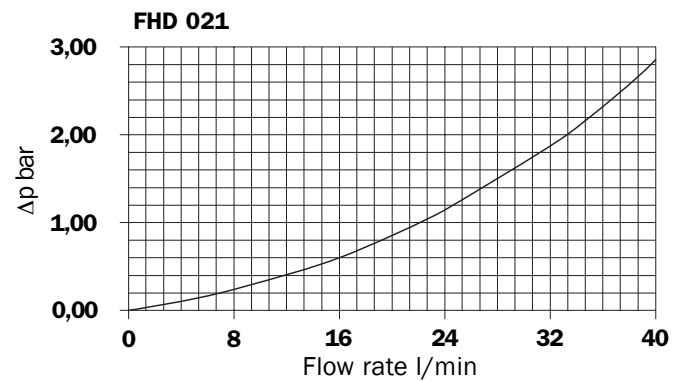
Connections

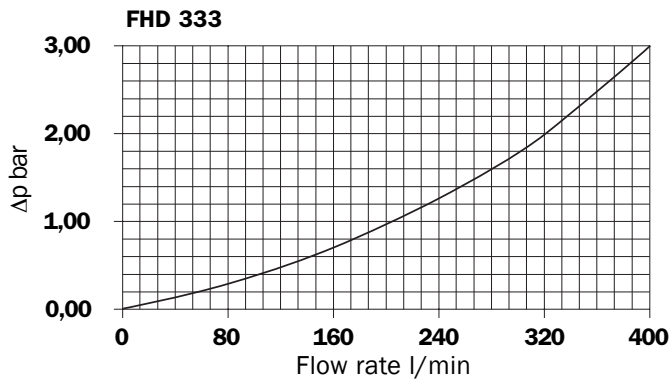
- FHD: In-line Inlet/Outlet 90°

Filter housings Δp pressure drop

The curves are plotted utilising mineral oil with density of 0.86 kg/dm³ to ISO 3968.

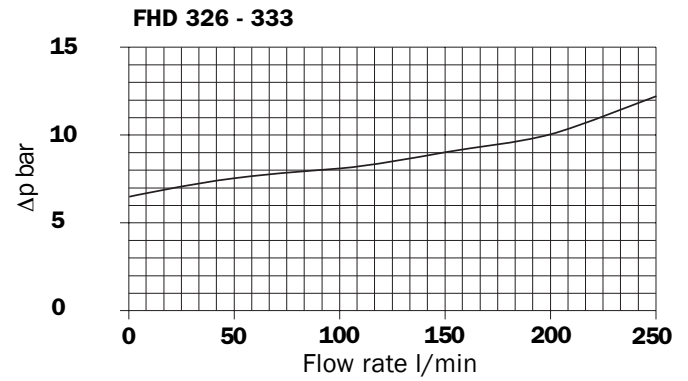
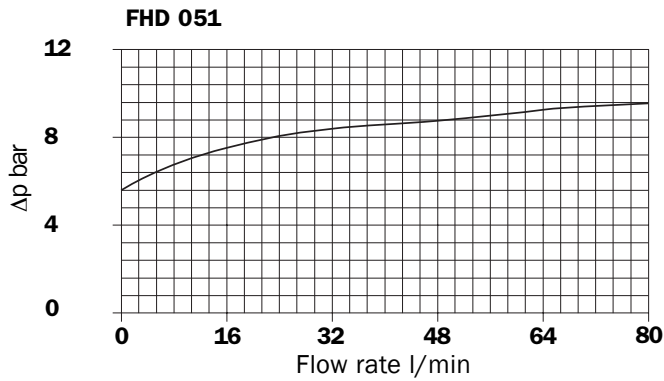
Δp varies proportionally with density.





Valves

Bypass valve pressure drop



Recommended maximum flow rate

- Pressure drop of filter assembly equal to Δp 2,5 bar.
- Oil kinematic viscosity 30 mm²/s (cSt).
- Density 0,86 kg/dm³.

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHD 021	2	10	12	21	23	27	30
	3	17	20	27	19	32	35
Serie H - Flow rate l/min							Serie N

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHD 051	2	56	59	70	74	80	84
	3	63	65	74	76	81	85
	4	70	72	78	79	82	86
	5	76	77	81	82	84	87
Serie R - Flow rate l/min							

Filtration

	Length	A03	A06	A10	A16	A25
FHD 051	2	52	55	67	71	78
	3	60	61	72	74	80
	4	67	69	76	77	81
	5	73	74	78	80	83
	Serie S - Flow rate l/min					

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHD 326	1	141	149	188	201	215	234
	2	194	200	224	228	233	236
	3	212	220	233	236	238	239
Serie R - Flow rate l/min							

Filtration

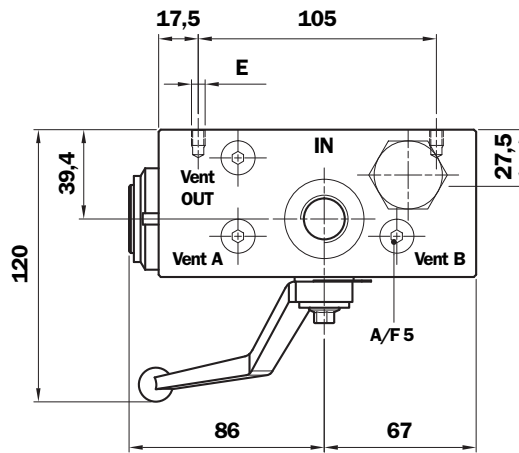
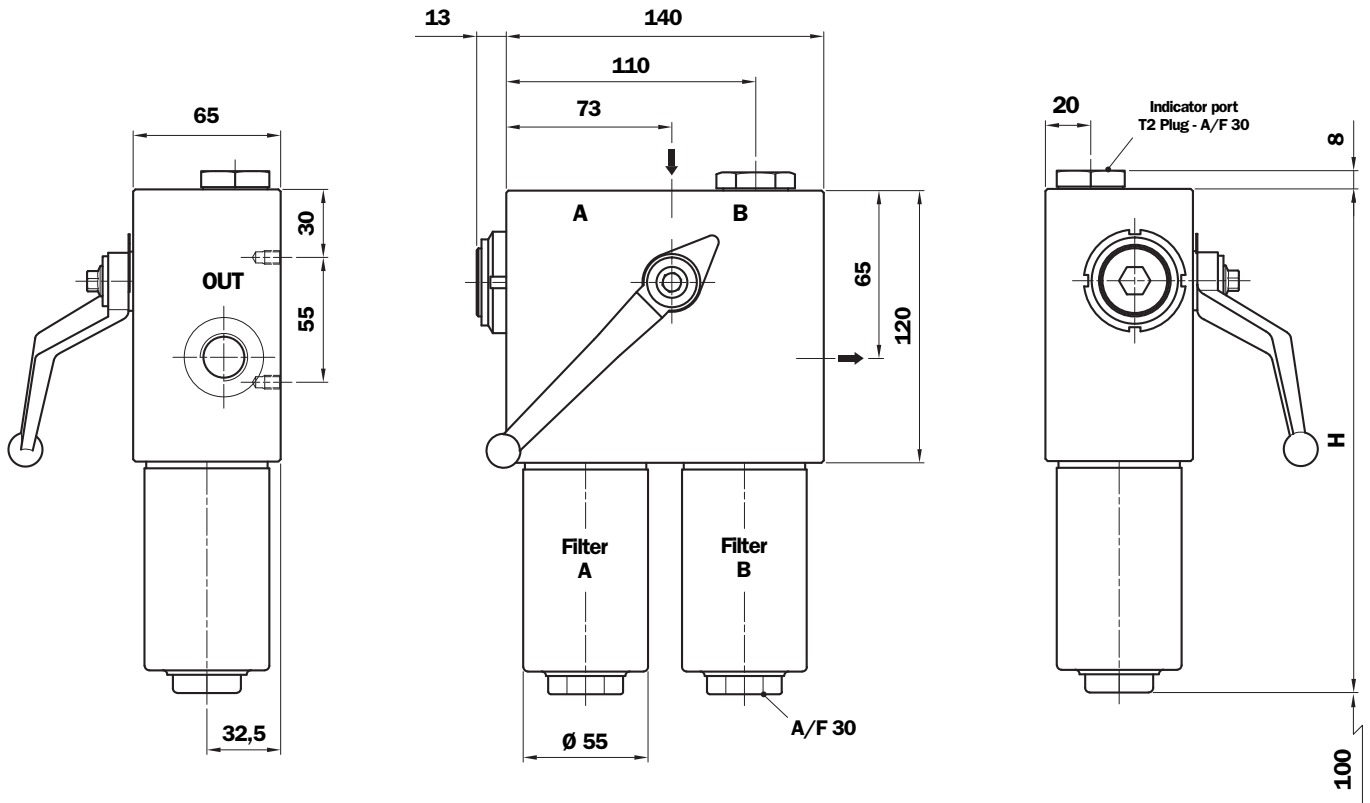
	Length	A03	A06	A10	A16	A25
FHD 326	1	128	133	172	175	206
	2	175	185	210	211	225
	3	197	208	223	224	232
Serie S - Flow rate l/min						

Filtration

	Length	A03	A06	A10	A16	A25	M25
FHD 333	2	254	265	311	318	332	338
	3	288	302	329	333	336	340
	4	302	311	331	336	342	345
Serie R - Flow rate l/min							

Filtration

	Length	A03	A06	A10	A16	A25
FHD 333	2	220	238	282	285	312
	3	260	280	307	311	325
	4	279	289	310	312	327
Serie S - Flow rate l/min						

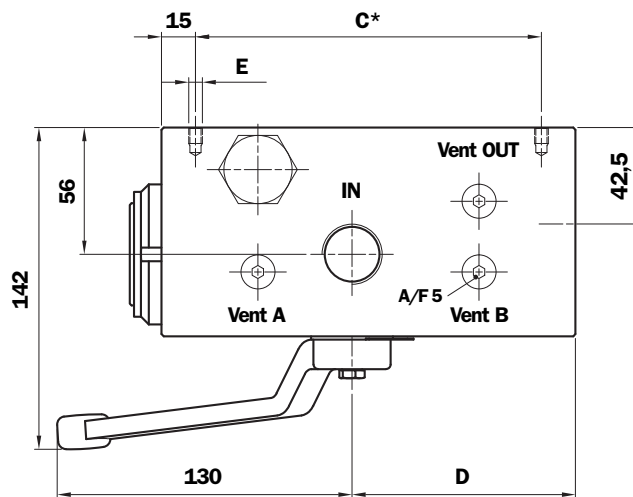
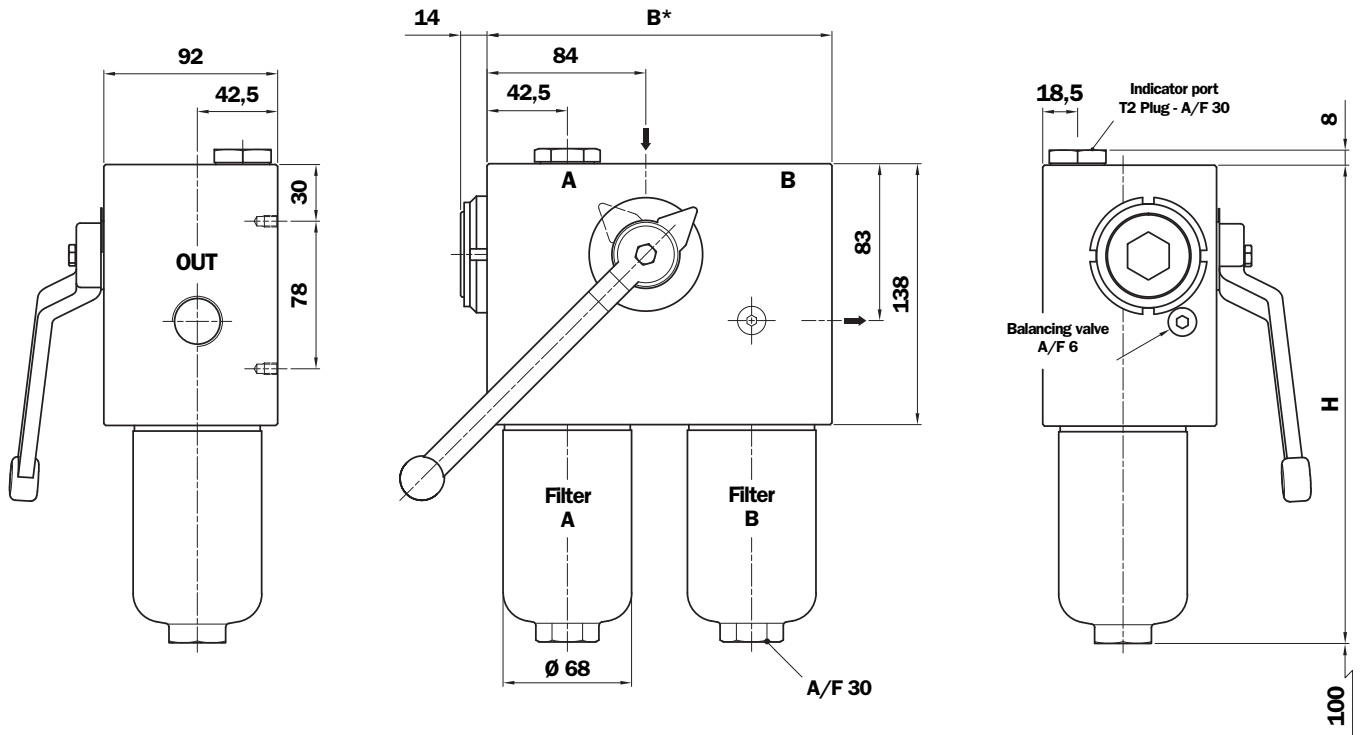


FHD 021

Thread connections

Length Filter	H mm
2	172
3	222
4	272

Type	Size	E Depth 7 mm
G1	G 1/2"	M6
G2	1/2" NPT	1/4" UNC
G3	SAE 8 - 3/4" - 16 UNF	1/4" UNC



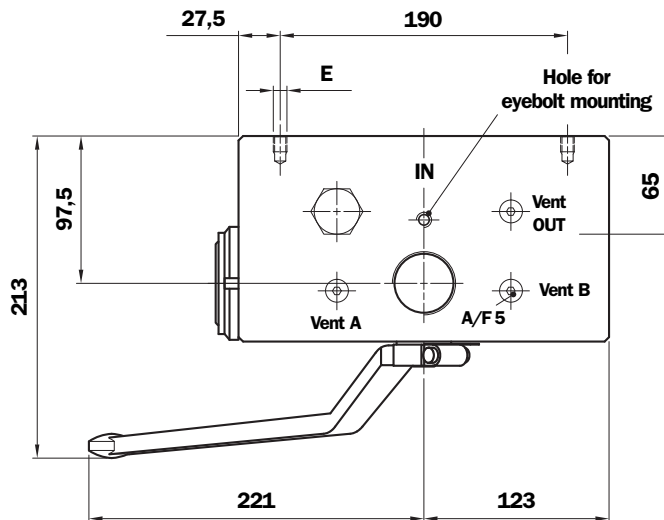
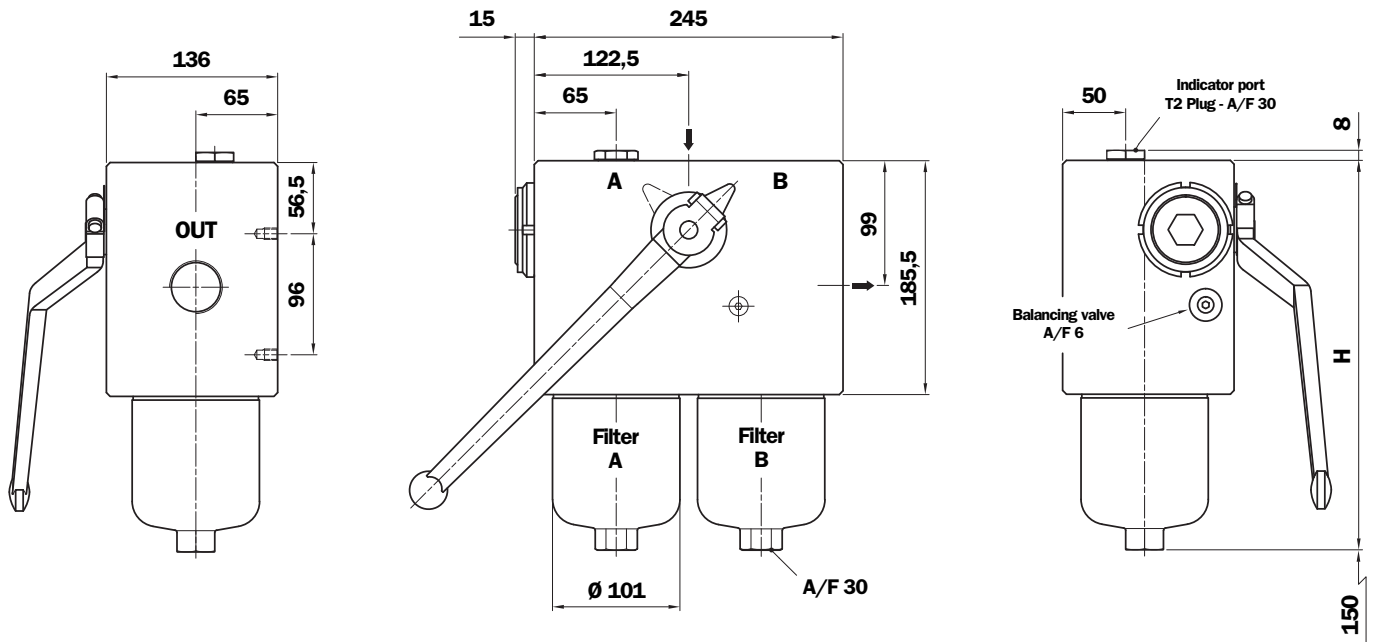
FHD 051

Length Filter	H mm
2	253
3	295
4	343
5	465

	B	C	D
With bypass	182,5	152,5	98,5
Without bypass	168	138	84

Thread connections

Type	Size	E Depth 7 mm
G1	G 3/4"	M6
G2	3/4" NPT	1/4" UNC
G3	G 1/2"	M6
G4	1/2" NPT	1/4" UNC
G5	SAE 8-3/4" -16 UNF	1/4" UNC
G6	SAE 12-1.1/16" -12 UN	1/4" UNC

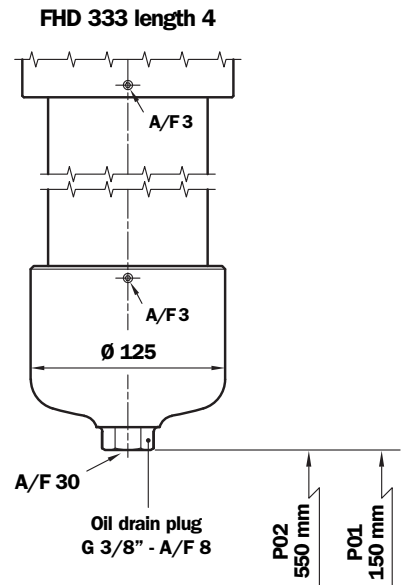
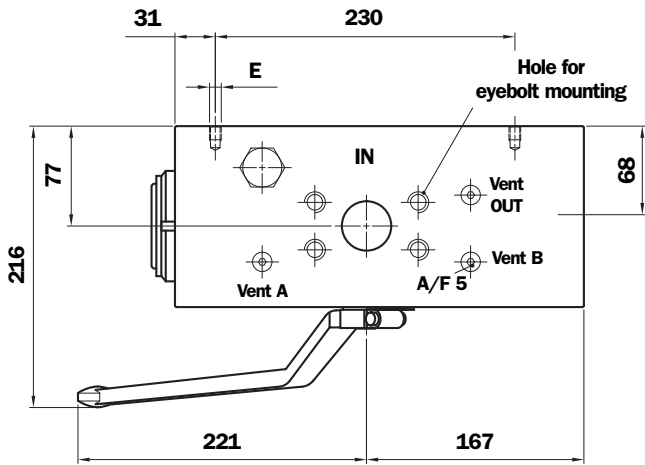
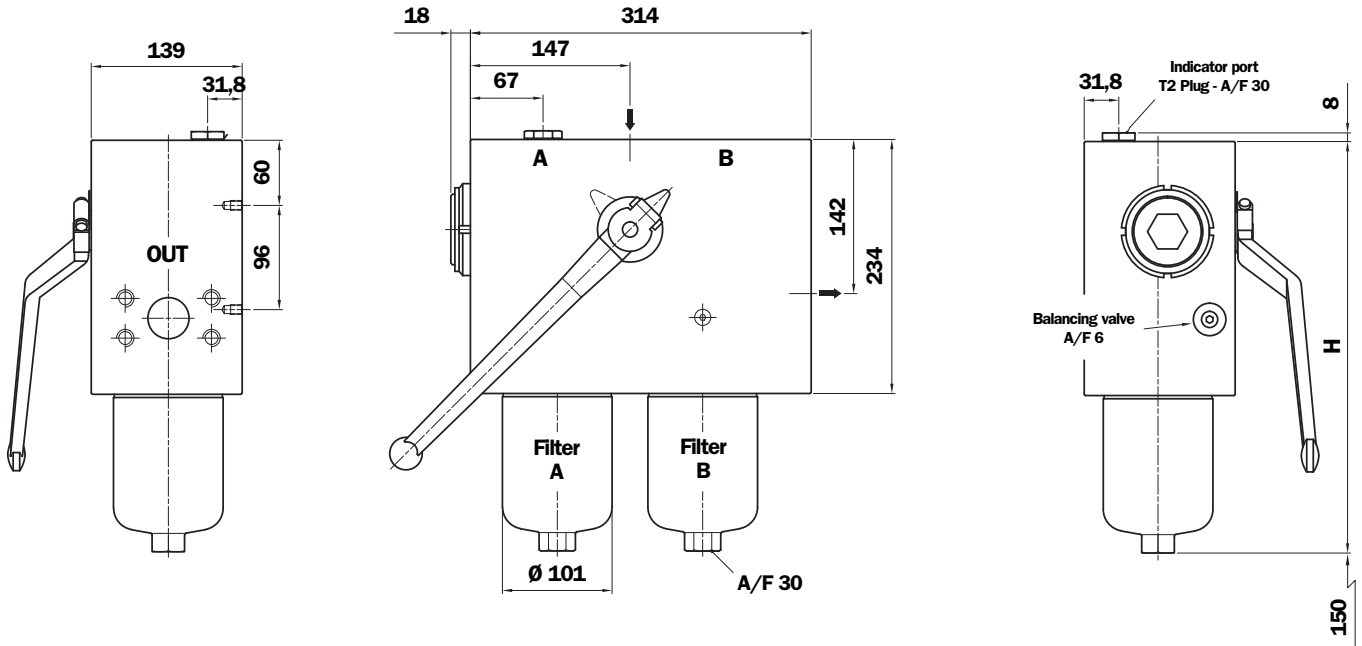


FHD 326

Length Filter	H mm
1	309
2	432
3	564

Thread connections

Type	Size	E Depth 11 mm
G1	G 1 1/4"	M10
G2	1 1/4" NPT	3/8" UNC
G3	SAE 20 - 15/8" - 12 UN	3/8" UNC



Style P01
Standard maintenance from head.

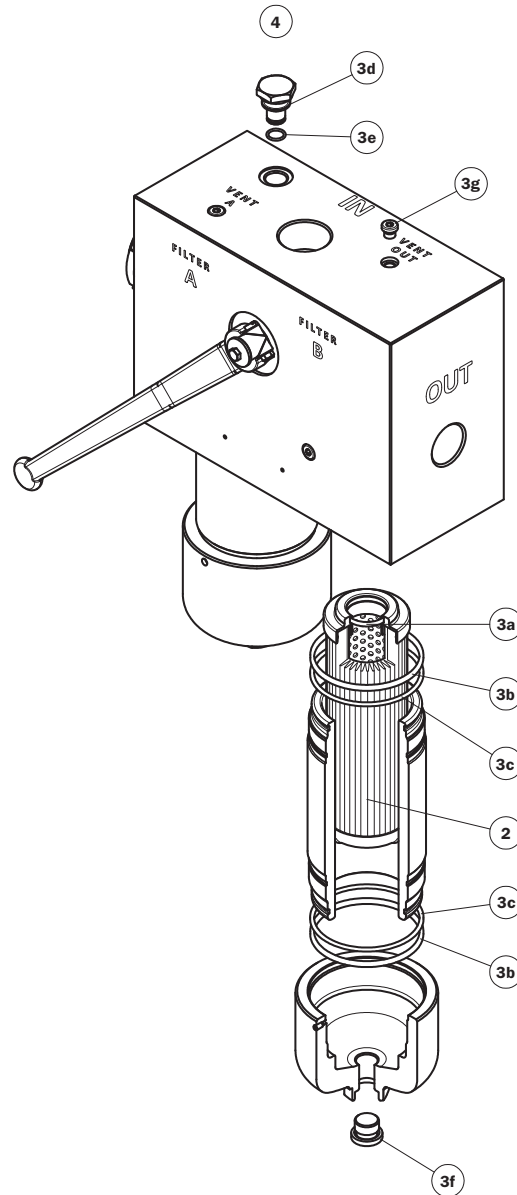
Style P02
Maintenance option from housing base.

FHD 333

Length Filter	H mm
2	479
3	612
4	765

Flanged connections

Type	Size	E Depth 11 mm
F1	1 1/2" 6000 psi/M	M10
F2	1 1/2" 6000 psi/UNC	3/8" UNC



Item	Description	Q.ty	FILTER Series							
			FHD 021		FHD 051		FHD 326		FHD 333	
1	Filter assembly	1	See order table							
2	Filter element	1	See order table							
3	Seal Kit	1	NBR 02050511	FPM 02050512	NBR 02050420	FPM 02050421	NBR 02050377	FPM 02050378	NBR 02050420	FPM 02050421
3a	Filter element seal	2	O-R 121 Ø 15,88 x 2,62		O-R 3093 Ø 23,67 x 2,62		O-R 144 Ø 39,69 x 2,62		O-R 3093 Ø 23,67 x 2,62	
3b	Bowl seal	2	O-R 3168 Ø 42,52 x 2,62		O-R 3225 Ø 56,82 x 2,62		4 pcs	O-R 3350 Ø 88,57 x 2,62	4 pcs	O-R 3350 Ø 88,57 x 2,62
3c	Bowl anti-extrusion ring	2	Parbak 131 Ø 43,33 x 2,18		Parbak 139 Ø 56,03 x 2,18		4 pcs	Parbak 153 Ø 89,36 x 2,18	4 pcs	Parbak 153 Ø 89,36 x 2,18
3d	Gasket	1	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)	01030058 (HNBR)	01030046 (FPM)
3e	O-Ring indicator	1	O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78		O-R 2050 Ø 12,42 x 1,78	
3f	Drain plug	2	G 1/8" with bonded seal		G 1/4" with bonded seal		G 3/8" with bonded seal		G 3/8" with bonded seal	
3g	Air vent	3	01029124 (HNBR)	01029094 (FPM)	01029124 (HNBR)	01029094 (FPM)	01029124 (HNBR)	01029094 (FPM)	01029124 (HNBR)	01029094 (FPM)
4	Indicator connection plug	1	T2H	T2V	T2H	T2V	T2H	T2V	T2H	T2V

Filter assembly FHD

	1	2	3	4	5	6	7	8a
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: FHD	051	4	S	A	G1	A10	S	P01

Filter element HP

	1	2	6	4	7	8b
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: HP	050	4	A10	A	S	P01

1 - Style

Filter	Filter element
<input type="checkbox"/> 021	<input type="checkbox"/> 011
<input type="checkbox"/> 051	<input type="checkbox"/> 050

2 - Filter length

<input type="checkbox"/> 021	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
<input type="checkbox"/> 051	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
			<input type="checkbox"/> 5

3 - Valves

<input type="checkbox"/> S	Without bypass
<input type="checkbox"/> B	With bypass (only for FHD 051)

4 - Filter seals

<input type="checkbox"/> A	NBR
<input type="checkbox"/> V	FPM
<input type="checkbox"/>	On request

5 - Connections

Threaded

FHD 021

Type	Size
G1	G 1/2"
G2	1/2" NPT
G3	SAE 8 - 3/4" - 16 UNF

FHD 051

Type	Size
G1	G 3/4"
G2	3/4" NPT
G3	G 1/2"
G4	1/2" NPT
G5	SAE 8 - 3/4" - 16 UNF
G6	SAE 12 - 1 1/16" - 12 UN

6 - Filter element

<input type="checkbox"/> A03	Inorganic microfibre 3 μ	} Absolute filtration Inorganic Microfibre $\beta_x(c) \geq 1000$
<input type="checkbox"/> A06	Inorganic microfibre 6 μ	
<input type="checkbox"/> A10	Inorganic microfibre 10 μ	
<input type="checkbox"/> A16	Inorganic microfibre 16 μ	
<input type="checkbox"/> A25	Inorganic microfibre 25 μ	
<input type="checkbox"/> M25	Wire mesh 25 μ	} Nominal Filtration Metal mesh

7 - Max filter element differential pressure

<input type="checkbox"/> N	Δp 20 bar (only for element M25)
<input type="checkbox"/> R	Δp 20 bar (excluded FHD 021)
<input type="checkbox"/> H	Δp 210 bar (only for FHD 021)
<input type="checkbox"/> S	Δp 210 bar (excluded FHD 021)

8 - Option

a - Filter

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> P02	MP with replacement of the filter element from the cap (only for length 4)
<input type="checkbox"/> Pxx	Customer request

b - Filter element

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> Pxx	Customer request

MP Filtri - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

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Filter assembly
FHD

	1	2	3	4	5	6	7	8a
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: FHD	333	4	S	A	G1	A10	S	P01

Filter element
HP

	1	2	6	4	7	8b
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example: HP	320	4	A10	A	S	P01

1 - Style

Filter	Filter element
<input type="checkbox"/> 326	<input type="checkbox"/> 320
<input type="checkbox"/> 333	<input type="checkbox"/> 320

2 - Filter length

<input type="checkbox"/> 326	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
<input type="checkbox"/> 333	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

3 - Valves

<input type="checkbox"/> S	Without bypass
<input type="checkbox"/> B	With bypass

4 - Filter seals

<input type="checkbox"/> A	NBR
<input type="checkbox"/> V	FPM
<input type="checkbox"/>	On request

5 - Connections

Threaded

FHD 326

Type	Size
G1	G 1 1/4"
G2	1 1/4" NPT
G3	SAE 20 - 1 5/8" - 12 UN

Flanged

FHD 333

Type	Size
F1	1 1/2" 6000 psi/M
F2	1 1/2" 6000 psi/UNC

6 - Filter element

<input type="checkbox"/> A03	Inorganic microfibre 3 μ	} Absolute filtration Inorganic Microfibre βx (c) ≥ 1000
<input type="checkbox"/> A06	Inorganic microfibre 6 μ	
<input type="checkbox"/> A10	Inorganic microfibre 10 μ	
<input type="checkbox"/> A16	Inorganic microfibre 16 μ	
<input type="checkbox"/> A25	Inorganic microfibre 25 μ	
<input type="checkbox"/> M25	Wire mesh 25 μ	} Nominal Filtration Metal mesh

7 - Max filter element differential pressure

<input type="checkbox"/> N	Δp 20 bar (only for element M25)
<input type="checkbox"/> R	Δp 20 bar
<input type="checkbox"/> S	Δp 210 bar

8 - Option

a - Filter

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> P02	MP with replacement of the filter element from the cap (only for length 4)
<input type="checkbox"/> Pxx	Customer request

b - Filter element

<input type="checkbox"/> P01	MP Filtri standard
<input type="checkbox"/> Pxx	Customer request

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CLOGGING INDICATORS





Contamination monitoring products

- Calibrated on test rigs manufactured and certified to ISO 11943 based on methods from ISO 11171
- On-line and In-line counting to 400 bar
- Bottle sampler options
- Mobile designs RS 232 - RS 485 digital bus interface



Suction filters

- Flow rates to 620 l/min
- Mounting:
- Tank immersed
 - In-Line
 - In tank with shut off valve
 - In tank with flooded suction



Return filters

- Flow rates to 3000 l/min
 - Pressure to 20 bar
- Mounting:
- In-Line
 - Tank top
 - In single and duplex designs



Pressure filters

- Flow rates to 700 l/min
 - Pressure from 110 bar to 560 bar
- Mounting:
- In-Line
 - Manifold
 - In single and duplex designs



Spin-On filters

- Flow rates to 300 l/min
 - Pressure to 35 bar
- Mounting:
- In-Line
 - Tank top



Stainless Steel Pressure filters

- Flow rates to 100 l/min
- Pressure from 350 bar to 700 bar

Mounting:

- In-Line
- Manifold
- In single and duplex designs



In-Line filters

- Flow rates to 3000 l/min
- Pressure to 80 bar

Mounting:

- In-Line
- Parallel manifold version
- In single and duplex designs



Filtration units

- Flow rates from 15 l/min to 200 l/min
- In static and mobile style



Accessories

- Oil filler and air breather plugs
- Optical and electrical level gauges
- Pressure gauge valve selectors
- Pipe fixing brackets
- Pressure gauges

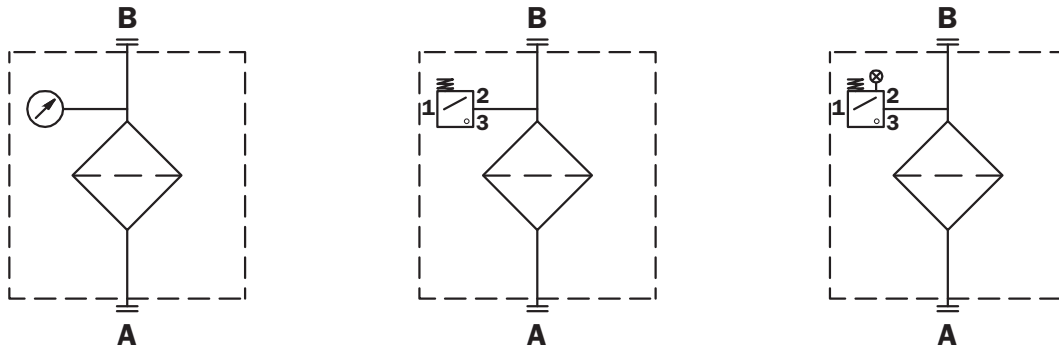


Mechanical Products

- Aluminium bell housings for motors from 0.12 kW to 400 kW
- Couplings in Aluminium - Cast Iron - Steel
- Damping rings
- Support feet
- Aluminium tanks
- Inspection doors

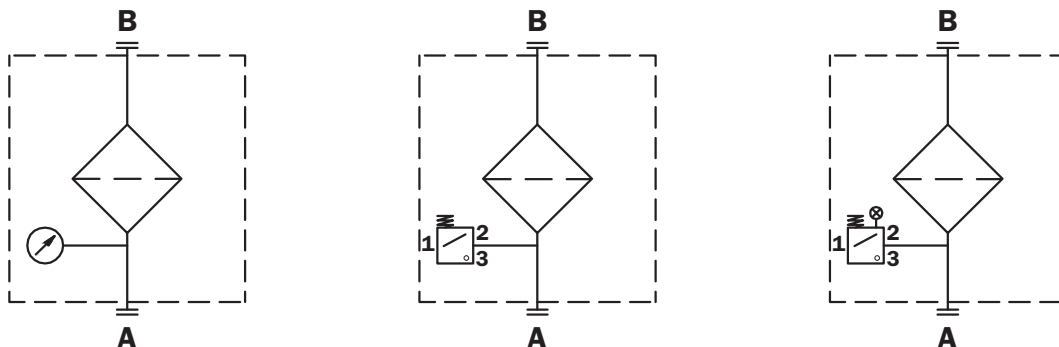
VACUUM INDICATORS

Vacuum indicators are used on the Suction line to check the efficiency of the filter element. They measure the pressure downstream of the filter element. Standard items are produced with R 1/4" EN 10226 connection. Available products with R 1/8" EN 10226 to be fitted on MPS series.



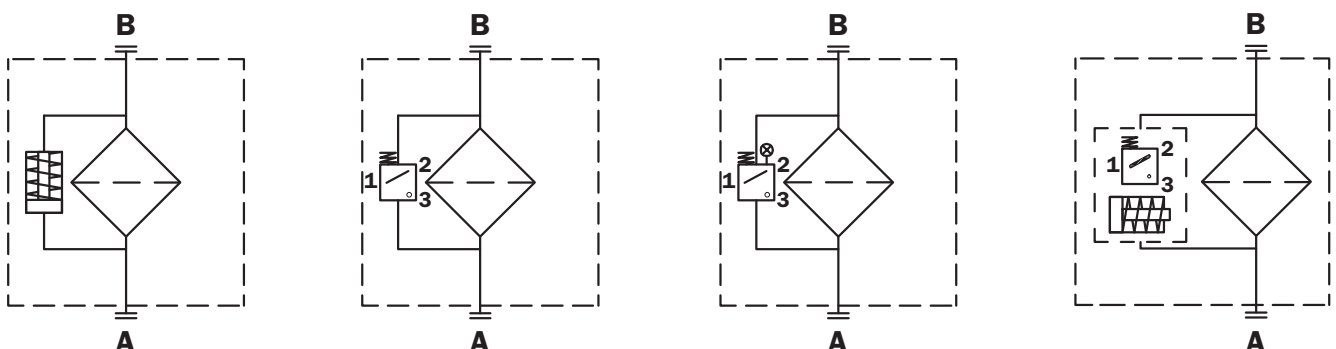
BAROMETRIC INDICATORS

Pressure indicators are used on the Return line to check the efficiency of the filter element. They measure the pressure upstream of the filter element. Standard items are produced with R 1/8" EN 10226 connection.



DIFFERENTIAL INDICATORS

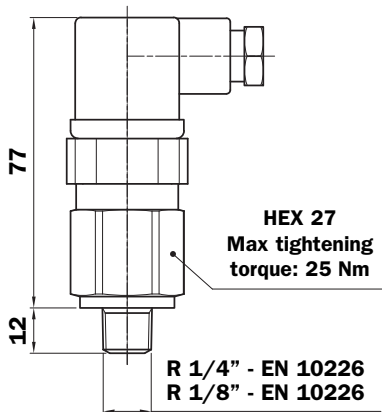
Differential indicators are used on the Pressure line to check the efficiency of the filter element. They measure the pressure upstream and downstream of the filter element (differential pressure). Standard items are produced with special connection G 1/2" size. Also available in Stainless Steel models.



Filter series	VISUAL INDICATOR	ELECTRICAL INDICATOR	ELECTRICAL/VISUAL INDICATOR	ELECTRONIC INDICATOR
Suction filters				
SF2 250 - 251 - 350 SF2 500 - 501 - 502 - 503 - 504 - 505 SF2 510 - 535 - 540 FAS	VVA16P01 VVR16P01	VEA21AA50P01	VLA21AA51P01 VLA21AA52P01 VLA21AA53P01 VLA21AA71P01	
Return filters				
MPF - MPT with bypass 1,75 bar MPH with bypass 1,75 bar	BVA14P01 BVR14P01 BVP15HAP01 BVP15HMP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01	
MPF - MPT with bypass 3 bar MPH with bypass 2,5 bar FRI 255 RF2 250	BVA25P01 BVR25P01 BVP20HAP01 BVP20HMP01	BEA20HA50P01 BEM20HA41P01	BLA20HA51P01 BLA20HA52P01 BLA20HA53P01 BLA20HA71P01	
FRI 025 - 040 - 100 - 250 - 630 - 850	DVA20xP01 DVM20xP01	DEA20xA50P01 DEM20xAxxP01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01
Suction/Return filters				
MRS 116 - 165 - 166 Suction line	VVB16P01 VVS16P01	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01	
MRS 116 - 165 - 166 Return line	BVA14P01 BVR14P01 BVP15HAP01 BVP15HMP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01	
Spin-On filters				
MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350 Suction line	VVB16P01 VVS16P01	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01	
MPS 050 - 070 - 100 - 150 MPS 200 - 250 - 300 - 350 MST 050 - 070 - 100 - 150 Return line	BVA14P01 BVR14P01 BVP15HAP01 BVP15HMP01	BEA15HA50P01 BEM15HA41P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01	
MPS 051 - 071 - 101 - 151 MPS 301 - 351 MSH 050 - 070 - 100 - 150 In-line	DVA12xP01 DVM12xP01	DEA12xA50P01 DEM12xAxxP01	DLA12xA51P01 DLA12xA52P01 DLA12xA71P01 DLE12xA50P01 DLE12xF50P01	

Filter series	VISUAL INDICATOR	ELECTRICAL INDICATOR	ELECTRICAL/VISUAL INDICATOR	ELECTRONIC INDICATOR
Low Pressure In-Line filters				
LMP 110 - 112 - 116 - 118 - 119 LMP 120 - 122 - 123 LMP 210 - 211 LMP 400 - 401 - 430 - 431 LMP 900 - 901 - 950 - 951 LMD 400 - 401 - 431 - 951 With bypass valve	DVA20xP01 DVM20xP01	DEA20xA50P01 DEM20xAxxP01	DLA20xA51P01 DLA20xA52P01 DLA20xA71P01 DLE20xA50P01 DLE20xF50P01	DTA20xF70P01
LMP 110 - 112 - 116 - 118 - 119 LMP 120 - 122 - 123 LMP 210 - 211 LMP 400 - 401 - 430 - 431 LMP 900 - 901 - 950 - 951 LMD 400 - 401 - 431 - 951 MPD 250 - 251 Without bypass valve	DVA50xP01 DVM50xP01	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01
High Pressure In-Line filters				
FMP 039 - 065 - 135 - 320 FMM 050 FHP 010 - 011 - 065 - 135 - 320 - 500 FHB 050 - 135 - 320 FHM 006 - 007 - 010 - 050 - 135 - 320 - 500 FHF 325 FHD 021 - 051 - 326 - 333 With bypass valve	DVA50xP01 DVM50xP01	DEA50xA50P01 DEM50xAxxP01	DLA50xA51P01 DLA50xA52P01 DLA50xA71P01 DLE50xA50P01 DLE50xF50P01	DTA50xF70P01
FMP 039 - 065 - 135 - 320 FMM 050 FHP 010 - 011 - 065 - 135 - 320 - 500 FHB 050 - 135 - 320 FHM 006 - 007 - 010 - 050 - 135 - 320 - 500 FHF 325 FHD 021 - 051 - 326 - 333 Without bypass valve	DVA70xP01 DVM70xP01	DEA70xA50P01 DEM70xAxxP01	DLA70xA51P01 DLA70xA52P01 DLA70xA71P01 DLE70xA50P01 DLE70xF50P01	DTA70xF70P01
Stainless Steel High Pressure In-Line filters				
FZB 039 FZP 039 - 136 FZH 010 - 011 - 039 With bypass valve	DVX50xP01 DVY50xP01	DEX50xA50P01	DLX50xA51P01 DLX50xA52P01 DLY50xA50P01	
FZB 039 FZP 039 - 136 FZH 010 - 011 - 039 Without bypass valve	DVX70xP01 DVY70xP01	DEX70xA50P01	DLX70xA51P01 DLX70xA52P01 DLY70xA50P01	

VEA - VEB



Available connections:
R 1/4" EN 10226 (VEA21AA50P01)
R 1/8" EN 10226 (VEB21AA50P01)

Electrical Vacuum Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

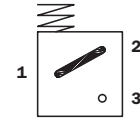
Technical data:

- Indicator type: Electrical vacuum indicator
- Setting pressure: -0,21 bar ±10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

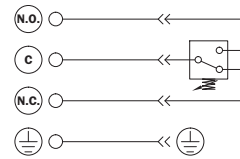
Electrical data:

- Resistive load: 5 A / 14 Vdc
4 A / 30 Vdc
5 A / 125 VAc
5 A / 250 VAc
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529
- Available ATEX product II 1GD Ex ia IIC Tx Ex ia IIIC Tx °C X

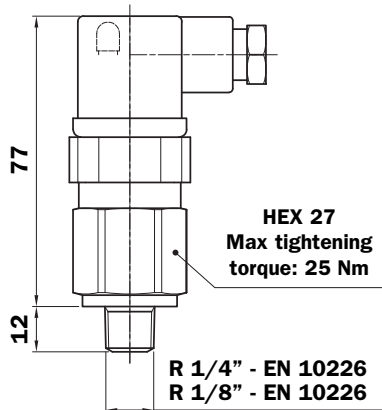
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



VLA - VLB



Available connections:
R 1/4" EN 10226 (VLA21AAxxP01)
R 1/8" EN 10226 (VLB21AAxxP01)

Electrical/Visual Vacuum Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

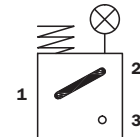
Technical data:

- Indicator type: Electrical/Visual vacuum indicator
- Setting pressure: -0,21 bar ±10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

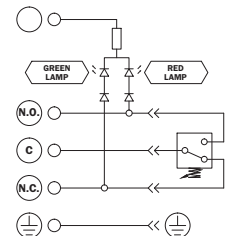
Electrical data:

- Resistive load: 51: 0,8 A / 24 Vdc
52: 0,2 A / 115 Vdc
53: 4 A / 230 Vdc
- Electrical connections: 51 - EN 175301-803 (24 Vdc lamps)
52 - EN 175301-803 (110 Vdc lamps)
53 - EN 175301-803 (230 VAc lamps)
- Protection degree: IP 65 in according to EN 60529

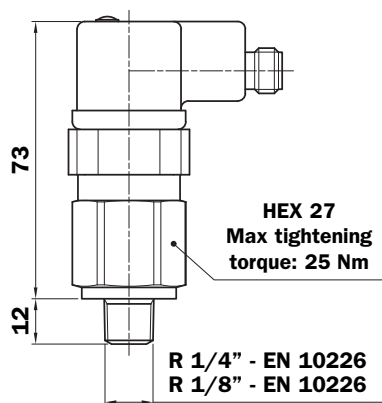
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



VLA - VLB



Available connections:
R 1/4" EN 10226 (VLA21AA71P01)
R 1/8" EN 10226 (VLB21AA71P01)

Electrical/Visual Vacuum Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

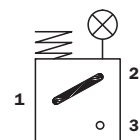
Technical data:

- Indicator type: Electrical/Visual vacuum indicator
- Setting pressure: -0,21 bar ±10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

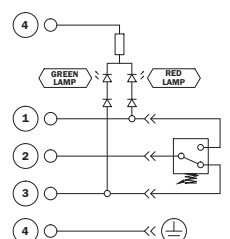
Electrical data:

- Resistive load: 0,4 A / 24 Vdc
- Electrical connections: 71 - M12 IEC 61076-2-101 (24 Vdc lamps)
- Protection degree: IP 65 in according to EN 60529

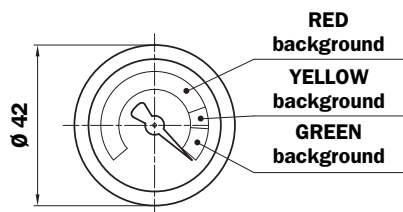
HYDRAULIC SYMBOL



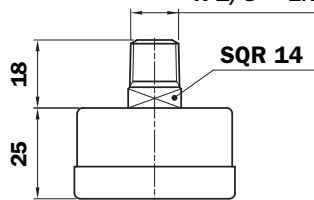
ELECTRICAL SYMBOL



VVA - VVB



R 1/4" - EN 10226
R 1/8" - EN 10226



Available connections:
R 1/4" EN 10226 (VVA16P01)
R 1/8" EN 10226 (VVB16P01)

Axial Vacuum Gauge

Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub Cu-alloy soft soldered

Technical data:

- Indicator type: Axial vacuum gauge
- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

HYDRAULIC SYMBOL



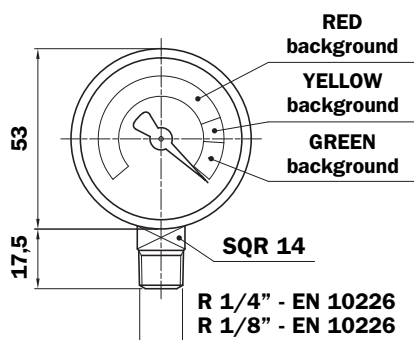
GRADUATED DISPLAY

GREEN BACKGROUND
(from 0 to -12 cmHg)
Clean filter element

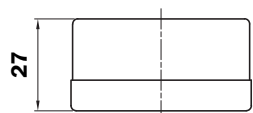
YELLOW BACKGROUND
(from -12 to -18 cmHg)
Warning

RED BACKGROUND
(from -18 to -76 cmHg)
Bypass

VVR - VVS



R 1/4" - EN 10226
R 1/8" - EN 10226



Available connections:
R 1/4" EN 10226 (VVR16P01)
R 1/8" EN 10226 (VVS16P01)

Radial Vacuum Gauge

Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub Cu-alloy soft soldered

Technical data:

- Indicator type: Radial vacuum gauge
- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40 °C to +60 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

HYDRAULIC SYMBOL



GRADUATED DISPLAY

GREEN BACKGROUND
(from 0 to -12 cmHg)
Clean filter element

YELLOW BACKGROUND
(from -12 to -18 cmHg)
Warning

REDBACKGROUND
(from -18 to -76 cmHg)
Bypass

Ordering information VE - VL - VV

Series	1	2	3	4	5	6	7
VE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	VE	A	21	A	A	50	P01

Series	1	2	3	4	5	6	7
VL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	VL	A	21	A	A	52	P01

Series	1	2	3	7
VV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	VV	A	16	P01

1 - Series

- VE** Electrical indicator
- VL** Electrical/Visual indicator
- VV** Visual indicator

2 - Type

VE - VL series

- A** R 1/4" EN 10226 connection
- B** R 1/8" EN 10226 connection

VV series

- A** Axial vacuumeter
R 1/4" EN 10226 connection
- B** Axial vacuumeter
R 1/8" EN 10226 connection
- R** Radial vacuumeter
R 1/4" EN 10226 connection
- S** Radial vacuumeter
R 1/8" EN 10226 connection

3 - Setting pressure

VEA - VLA series

- 21** -0,21 bar

VVA - VVR series

- 16** -0,16 bar

4 - Seals (excluded for VV)

- A** NBR
- On request

5 - Thermostat (excluded for VV)

- A** Without thermostat

6 - Electrical connection (excluded for VV)

VEA series

- 50** EN 175301-803 connector

VLA series

- 51** EN 175301-803 clear connector
with 24 V lamps
- 52** EN 175301-803 clear connector
with 110 V lamps
- 53** EN 175301-803 clear connector
with 230 V lamps
- 71** M12 IEC 61076-2-101 clear
connector with 24 V lamps

7 - Option

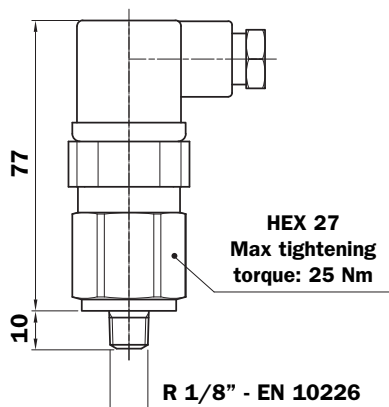
- P01** MP Filtri standard
- Pxx** Customer request



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BEA



Available setting:
1,5 bar ±10% (BEA15HA50P01)
2 bar ±10% (BEA20HA50P01)

Electrical Pressure Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

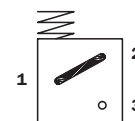
Technical data:

- Indicator type: Electrical pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

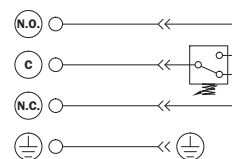
Electrical data:

- Resistive load: 5 A / 14 VDC
4 A / 30 VDC
5 A / 125 VAC
5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529
- Available Atex product II 1GD Ex ia IIC Tx Ex ia IIC Tx °C X

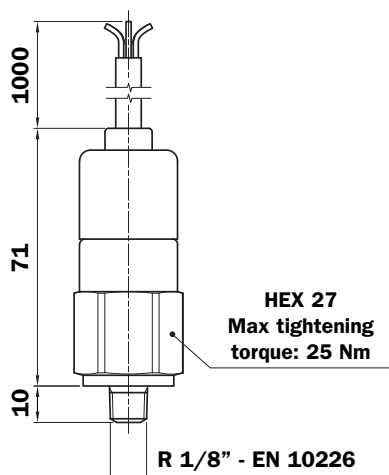
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



BEM



Available setting:
1,5 bar ±10% (BEM15HA50P01)
2 bar ±10% (BEM20HA50P01)

Electrical Pressure Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR

Technical data:

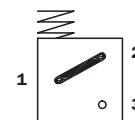
- Indicator type: Electrical pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

Electrical data:

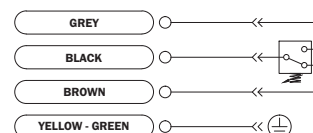
- Resistive load: 5 A / 14 VDC
4 A / 30 VDC
5 A / 125 VAC
5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 67 in according to EN 60529

On request this indicator can be provided with main connectors in use for wirings.

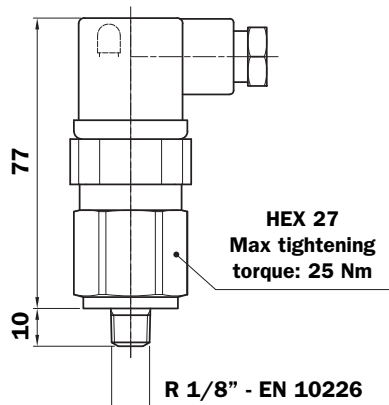
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



BLA



Available setting:
1,5 bar ±10% (BLA15HAxxP01)
2 bar ±10% (BLA20HAxxP01)

Electrical/Visual Pressure Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

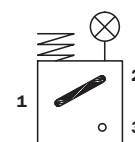
Technical data:

- Indicator type: Electrical/Visual pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

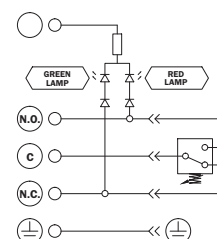
Electrical data:

- Resistive load: 51: 0,8 A / 24 VDC
52: 0,2 A / 115 VDC
53: 4 A / 230 VDC
- Electrical connections: 51 - EN 175301-803 (24 VDC lamps)
52 - EN 175301-803 (110 VDC lamps)
53 - EN 175301-803 (230 VAC lamps)
- Protection degree: IP 65 in according to EN 60529

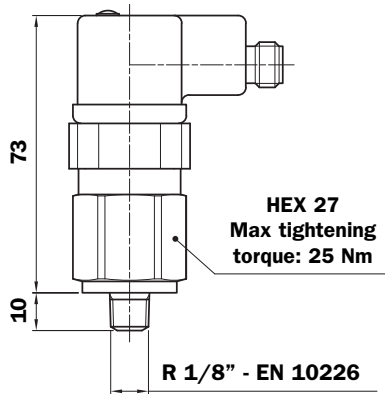
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



BLA



Available setting:
1,5 bar $\pm 10\%$ (BLA15HA71P01)
2 bar $\pm 10\%$ (BLA20HA71P01)

Electrical/Visual Pressure Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

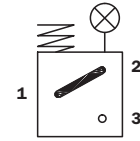
Technical data:

- Indicator type: Electrical/Visual pressure indicator
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25°C to $+80^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

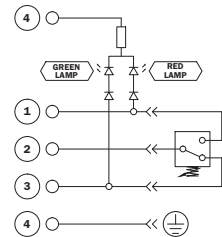
Electrical data:

- Resistive load: 0,4 A / 24 VDC
- Electrical connections: 71 - M12 IEC 61076-2-101 (24 VDC lamps)
- Protection degree: IP 65 in according to EN 60529

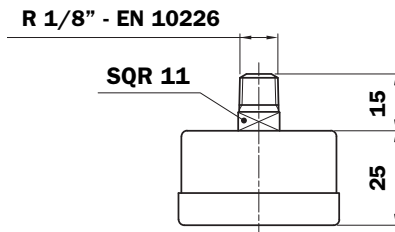
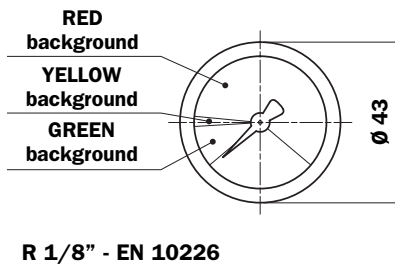
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



BVA



Available setting:
1,4 bar $\pm 10\%$ (BVA14P01)
2,5 bar $\pm 10\%$ (BVA25P01)

Axial Pressure Gauge

Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub cu-alloy soft soldered

Technical data:

- Indicator type: Axial pressure gauge
- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40°C to $+60^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

HYDRAULIC SYMBOL

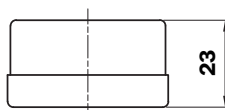
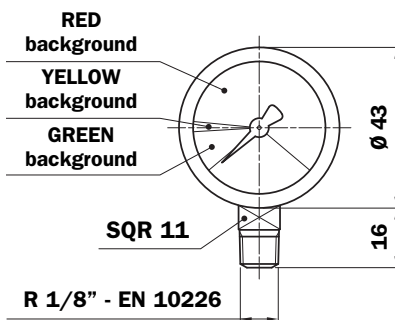


GRADUATED DISPLAY

BVA14P01
GREEN BACKGROUND (from 0 to 1,4 bar)
Clean filter element
YELLOW BACKGROUND (from 1,4 to 1,7 bar)
Warning
RED BACKGROUND (from 1,7 to 10 bar)
Bypass

BVA25P01
GREEN BACKGROUND (from 0 to 2,5 bar)
Clean filter element
YELLOW BACKGROUND (from 2,5 to 3 bar)
Warning
RED BACKGROUND (from 3 to 10 bar)
Bypass

BVR



Available setting:
1,4 bar $\pm 10\%$ (BVR14P01)
2,5 bar $\pm 10\%$ (BVR25P01)

Radial Pressure Gauge

Materials:

- Case: Painted Steel
- Window: Clear plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tub cu-alloy soft soldered

Technical data:

- Indicator type: Radial pressure gauge
- Max working pressure: Static: 7 bar
Fluctuating: 6 bar
Short time: 10 bar
- Working temperature: From -40°C to $+60^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943
- Accuracy class: cl. 2.5
- Protection degree: IP 31 in according to EN 60529

HYDRAULIC SYMBOL



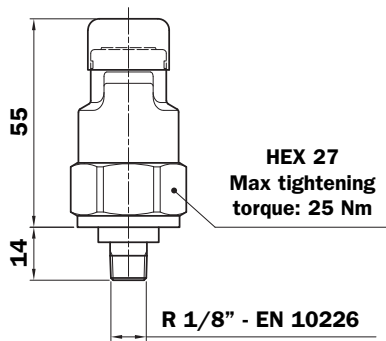
GRADUATED DISPLAY

BVR14P01
GREEN BACKGROUND (from 0 to 1,4 bar)
Clean filter element
YELLOW BACKGROUND (from 1,4 to 1,7 bar)
Warning
RED BACKGROUND (from 1,7 to 10 bar)
Bypass

BVR25P01
GREEN BACKGROUND (from 0 to 2,5 bar)
Clean filter element
YELLOW BACKGROUND (from 2,5 to 3 bar)
Warning
RED BACKGROUND (from 3 to 10 bar)
Bypass

BAROMETRIC INDICATORS

BVP - BVQ



Available setting:
 1,5 bar $\pm 10\%$ (BVP15AP01 - BVQ15AP01)
 2 bar $\pm 10\%$ (BVP20AP01 - BVQ20AP01)

Visual Pressure Indicator

Materials:

- Body: Brass
- Internal parts: Nylon
- Seals: NBR

Technical data:

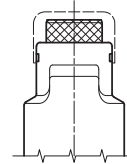
- Indicator type: Visual pressure indicator
- Reset: BVP - Automatic reset
BVQ - Manual reset
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25°C to $+80^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943
- Protection degree: IP 45 in according to EN 60529

HYDRAULIC SYMBOL

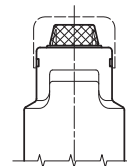


SIGNALS

GREEN BUTTON: INLET PRESSURE



RED BUTTON: CLOGGED FILTER ELEMENT



Series	1	2	3	4	5	6	7
BE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	BE	A	20	H	A	50	P01

Series	1	2	3	4	5	6	7
BL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	BL	A	20	H	A	52	P01

Series	1	2	3	4	7
BV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	BV	P	20	H	P01

Series	1	2	3	7
BV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	BV	A	14	P01

1 - Series

- BE** Electrical indicator
- BL** Electrical/Visual indicator
- BV** Visual indicator

2 - Type

BE series

- A** Standard type
- M** With wired connector

BL series

- A** Standard type

BV series

- A** Axial manometer
- R** Radial manometer
- P** Visual pressure indicator - Automatic reset
- Q** Visual pressure indicator - Manual reset

3 - Setting pressure

BEA - BEM - BLA - BVP series

- 15** 1,5 bar
- 20** 2 bar

BVA - BVR series

- 14** 1,4 bar
- 25** 2,5 bar

4 - Seals (excluded for BVA - BVR)

- H** HNBR
- On request

5 - Thermostat (excluded for BV)

- A** Without thermostat

6 - Electrical connection (excluded for BV)

BEA series

- 50** EN 175301-803 connector

BEM series

- 41** Four core cable
- On request

BLA series

- 51** EN 175301-803 clear connector with 24 V lamps
- 52** EN 175301-803 clear connector with 110 V lamps
- 53** EN 175301-803 clear connector with 230 V lamps
- 71** M12 IEC 61076-2-101 clear connector with 24 V lamps

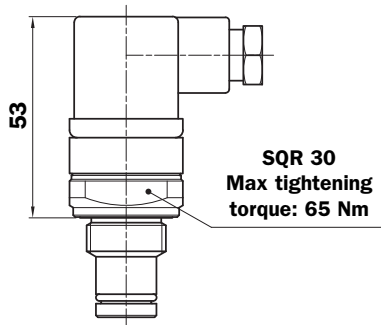
7 - Option

- P01** MP Filtri standard
- Pxx** Customer request

MP Filtri - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

The data in this publication are purely guideline. MP Filtri reserves the right to make changes to the models described herein at any time it deems fit in relation to technical or commercial requirements. The colours of the products shown on the cover are purely guideline. Copyright. All rights reserved.

DEA



Available setting:
1,2 bar ±10% (DEA12xA50P01)
2 bar ±10% (DEA20xA50P01)
5 bar ±10% (DEA50xA50P01)
7 bar ±10% (DEA70xA50P01)
9,5 bar ±10% (DEA95xA50P01)

Electrical Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

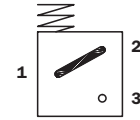
Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

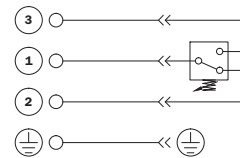
Electrical data:

- Resistive load: 0,2 A / 115 VDC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 66 in according to EN 60529
IP 69K in according to ISO 20653

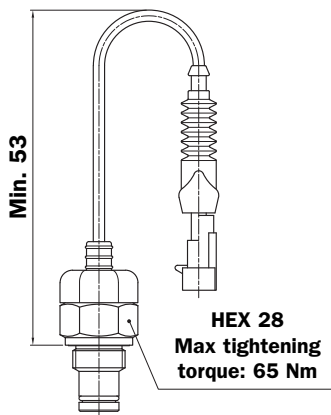
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DEM



Available setting:
1,2 bar ±10% (DEM12xx10P01)
2 bar ±10% (DEM20xx10P01)
5 bar ±10% (DEM50xx10P01)
7 bar ±10% (DEM70xx10P01)
9,5 bar ±10% (DEM95xx10P01)

Electrical Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

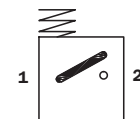
Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

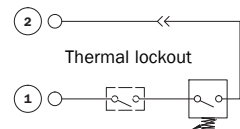
Electrical data:

- Resistive load: 0,2 A / 115 VDC
- Electrical connections: 10 - AMP Superseal series 1,5
- Switching type: Normally open contacts (N.C. on request)
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

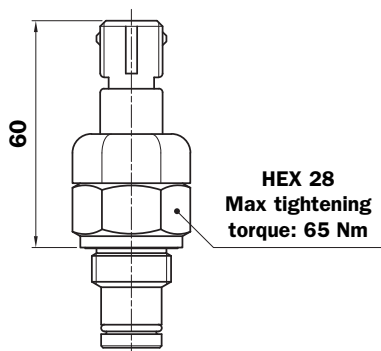
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DEM



Available setting:
1,2 bar ±10% (DEM12xx20P01)
2 bar ±10% (DEM20xx20P01)
5 bar ±10% (DEM50xx20P01)
7 bar ±10% (DEM70xx20P01)
9,5 bar ±10% (DEM95xx20P01)

Electrical Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

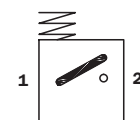
Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

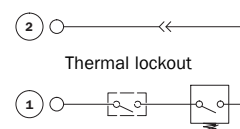
Electrical data:

- Resistive load: 0,2 A / 115 VDC
- Electrical connections: 20 - AMP Time junior
- Switching type: Normally open contacts (N.C. on request)
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

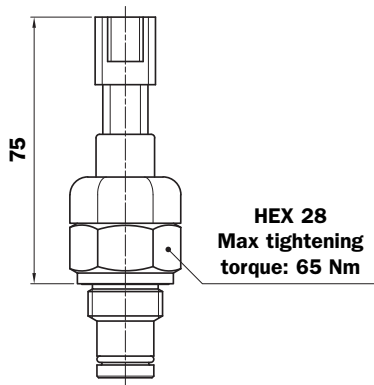
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DEM



Available setting:
1,2 bar ±10% (DEM12xx30P01)
2 bar ±10% (DEM20xx30P01)
5 bar ±10% (DEM50xx30P01)
7 bar ±10% (DEM70xx30P01)
9,5 bar ±10% (DEM95xx30P01)

Electrical Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

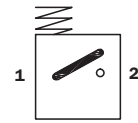
Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

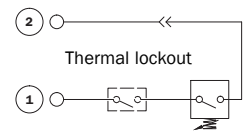
Electrical data:

- Resistive load: 0,2 A / 115 Vdc
- Electrical connections: 30 - Deutsch DT-04-2-P
- Switching type: Normally open contacts (N.C. on request)
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

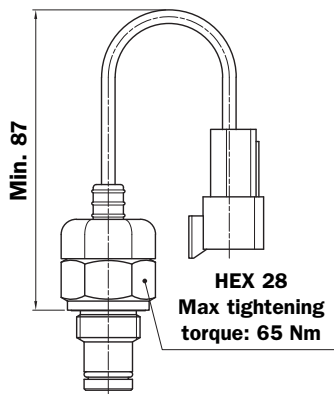
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DEM



Available setting:
1,2 bar ±10% (DEM12xx35P01)
2 bar ±10% (DEM20xx35P01)
5 bar ±10% (DEM50xx35P01)
7 bar ±10% (DEM70xx35P01)
9,5 bar ±10% (DEM95xx35P01)

Electrical Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

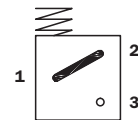
Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

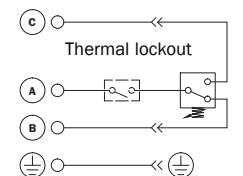
Electrical data:

- Resistive load: 0,2 A / 115 Vdc
- Electrical connections: 35 - Deutsch DT-04-3-P
- Switching type: SPDT contact
- Thermal lockout: Normally open up to 30 °C (F option)
- Protection degree: IP 66 in according to EN 60529

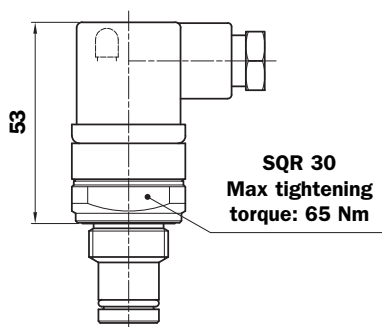
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DLA



Available setting:
1,2 bar ±10% (DLA12xAxxP01)
2 bar ±10% (DLA20xAxxP01)
5 bar ±10% (DLA50xAxxP01)
7 bar ±10% (DLA70xAxxP01)
9,5 bar ±10% (DLA95xAxxP01)

Electrical/Visual Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

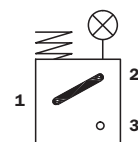
Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

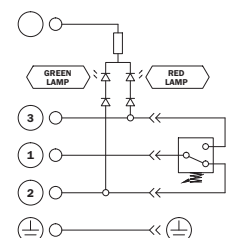
Electrical data:

- Resistive load: 51: 0,8 A / 24 Vdc
52: 0,2 A / 115 Vdc
- Electrical connections: 51 - EN 175301-803 (24 Vdc lamps)
52 - EN 175301-803 (110 Vdc lamps)
- Protection degree: IP 66 in according to EN 60529
IP 69K in according to ISO 20653

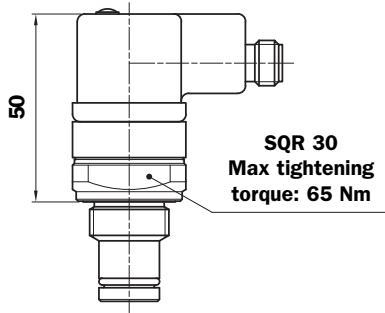
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DLA



Available setting:

- 1,2 bar ±10% (DLA12xA71P01)
- 2 bar ±10% (DLA20xA71P01)
- 5 bar ±10% (DLA50xA71P01)
- 7 bar ±10% (DLA70xA71P01)
- 9,5 bar ±10% (DLA95xA71P01)

Electrical/Visual Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

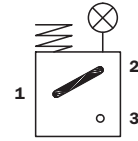
Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

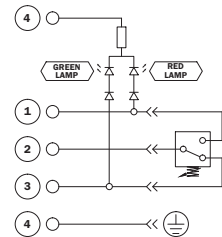
Electrical data:

- Resistive load: 0,4 A / 24 Vdc
- Electrical connections: 71 - M12 IEC 61076-2-101 (24 Vdc lamps)
- Protection degree: IP 65 in according to EN 60529
IP 69K in according to ISO 20653

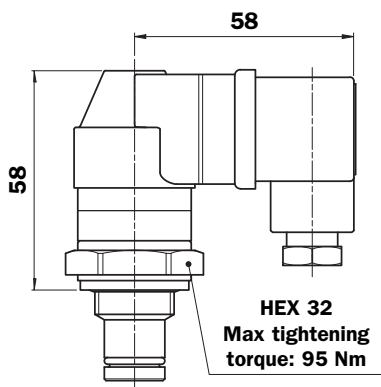
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DLE



Available setting:

- 1,2 bar ±10% (DLE12VA50P01)
- 2 bar ±10% (DLE20VA50P01)
- 5 bar ±10% (DLE50VA50P01)
- 7 bar ±10% (DLE70VA50P01)
- 9,5 bar ±10% (DLE95VA50P01)

Electrical/Visual Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: FPM

Technical data:

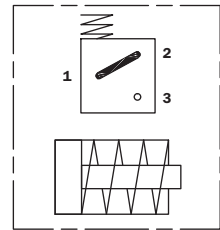
- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

Electrical data:

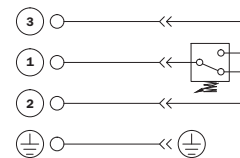
- Resistive load: 5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529

Available the connector with lamps

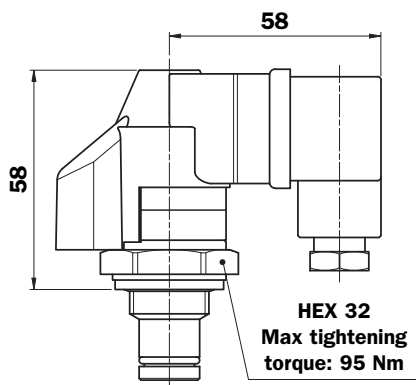
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DLE



Available setting:

- 1,2 bar ±10% (DLE12VF50P01)
- 2 bar ±10% (DLE20VF50P01)
- 5 bar ±10% (DLE50VF50P01)
- 7 bar ±10% (DLE70VF50P01)
- 9,5 bar ±10% (DLE95VF50P01)

Electrical/Visual Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: FPM

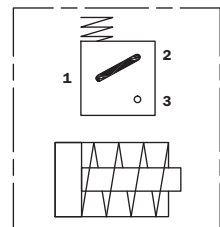
Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

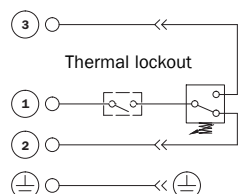
Electrical data:

- Resistive load: 5 A / 250 VAC
- Thermal lockout setting: +30 °C
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529

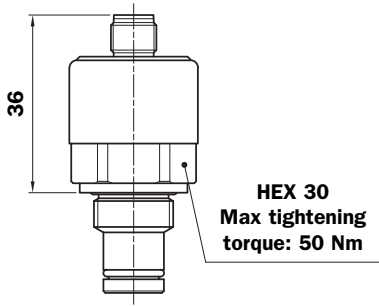
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DTA



Available setting:
1,2 bar ±10% (DTA12xF70P01)
2 bar ±10% (DTA20xF70P01)
5 bar ±10% (DTA50xF70P01)
7 bar ±10% (DTA70xF70P01)
9,5 bar ±10% (DTA95xF70P01)

Electronic Differential Indicator

Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: NBR

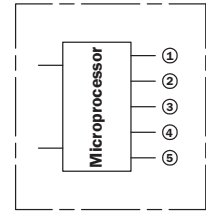
Technical data:

- Indicator type: Electronic differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

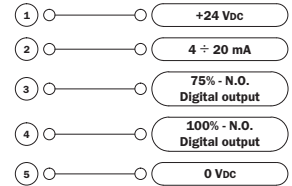
Electrical data:

- Power supply: 24 VDC
- Analogue output: From 4 to 20 mA
- Thermal lockout: 30 °C (all output signals stalled up to 30 °C)
- Protection degree: IP 67 in according to EN 60529

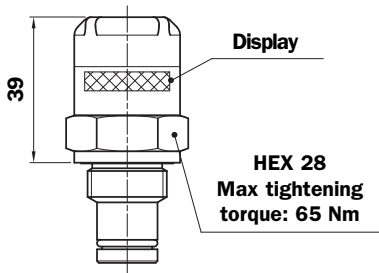
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DVA



Available setting:
1,2 bar ±10% (DVA12xP01)
2 bar ±10% (DVA20xP01)
5 bar ±10% (DVA50xP01)
7 bar ±10% (DVA70xP01)
9,5 bar ±10% (DVA95xP01)

Visual Differential Indicator

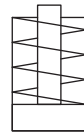
Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

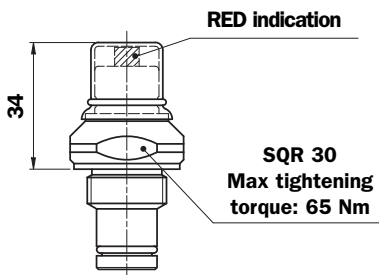
Technical data:

- Indicator type: Visual differential indicator
- Reset: Automatic reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

HYDRAULIC SYMBOL



DVM



Available setting:
1,2 bar ±10% (DVM12xP01)
2 bar ±10% (DVM20xP01)
5 bar ±10% (DVM50xP01)
7 bar ±10% (DVM70xP01)
9,5 bar ±10% (DVM95xP01)

Visual Differential Indicator

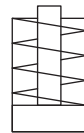
Materials:

- Body: Brass
- Internal parts: Brass - Nylon
- Seals: HNBR - FPM

Technical data:

- Indicator type: Visual differential indicator
- Reset: Manual reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

HYDRAULIC SYMBOL



Series	1	2	3	4	5	6	7
DE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	DE	A	20	H	A	50	P01

Series	1	2	3	4	5	6	7
DL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	DL	A	20	H	A	52	P01

Series	1	2	3	4	5	6	7
DT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	DT	A	20	H	F	70	P01

Series	1	2	3	4	7
DV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	DV	A	20	H	P01

1 - Series

- DE** Electrical indicator
- DL** Electrical/Visual indicator
- DT** Electronic indicator
- DV** Visual indicator

2 - Type

DE series

- A** Standard type
- M** With wired connector

DL series

- A** Standard type
- E** Standard type for High power supply

DT series

- A** Standard type

DV series

- A** Automatic reset
- M** Manual reset

3 - Setting pressure

- 12** 1,5 bar
- 20** 2 bar
- 50** 5 bar
- 70** 7 bar
- 95** 9,5 bar

4 - Seals

- H** HNBR
- On request

5 - Thermostat (excluded for DV)

- A** Without thermostat
- F** With thermostat (Normally open up to 30°C)
Option available only for DEM-DTA series

6 - Electrical connection (excluded for BV)

DEA - DLE series

- 50** EN 175301-803 connector

DEM series

- 10** AMP Superseal series 1,5
(Normally open contacts)
- 20** AMP Timer Junior
(Normally open contacts)
- 30** Deutsch DT-04-2-P
(Normally open contacts)
- 35** Deutsch DT-04-3-P
(Change over contacts)
- On request

DLA series

- 51** EN 175301-803 clear connector
with 24 V lamps
- 52** EN 175301-803 clear connector
with 110 V lamps
- 71** M12 IEC 61076-2-101 clear
connector with 24 V lamps

DTA series

- 70** M12 IEC 61076-2-101 connector

7 - Option

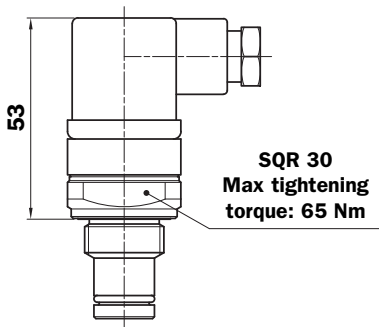
- P01** MP Filtri standard
- Pxx** Customer request

MP Filtri - The filter functions as described in this bulletin are valid exclusively for original MP Filtri filter elements and replacement parts. All rights reserved

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STAINLESS STEEL DIFFERENTIAL INDICATORS

DEX



Available setting:
 1,2 bar ±10% (DEX12xA50P01)
 2 bar ±10% (DEX20xA50P01)
 5 bar ±10% (DEX50xA50P01)
 7 bar ±10% (DEX70xA50P01)
 9,5 bar ±10% (DEX95xA50P01)

Electrical Differential Indicator

Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: HNBR - MFQ

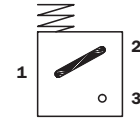
Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

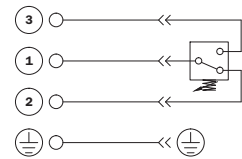
Electrical data:

- Resistive load: 0,2 A / 115 Vdc
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 66 in according to EN 60529
IP 69K in according to ISO 20653

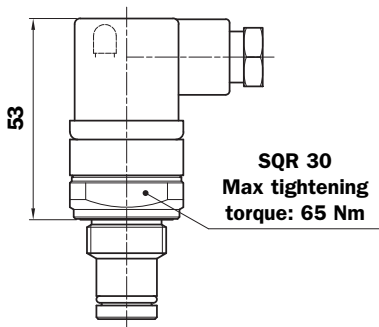
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DLX



Available setting:
 1,2 bar ±10% (DLX12xAxxP01)
 2 bar ±10% (DLX20xAxxP01)
 5 bar ±10% (DLX50xAxxP01)
 7 bar ±10% (DLX70xAxxP01)
 9,5 bar ±10% (DLX95xAxxP01)

Electrical/Visual Differential Indicator

Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: HNBR - MFQ

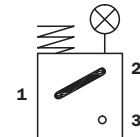
Technical data:

- Indicator type: Electrical differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

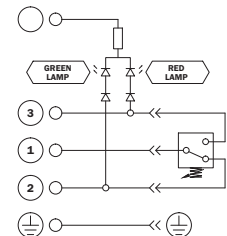
Electrical data:

- Resistive load: 51: 0,8 A / 24 VDC
52: 0,2 A / 115 VDC
- Electrical connections: 51 - EN 175301-803 (24 VDC lamps)
52 - EN 175301-803 (110 VDC lamps)
- Protection degree: IP 66 in according to EN 60529
IP 69K in according to ISO 20653

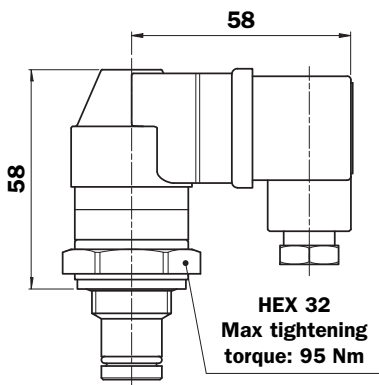
HYDRAULIC SYMBOL



ELECTRICAL SYMBOL



DLY



Available setting:
 1,2 bar ±10% (DLY12VA50P01)
 2 bar ±10% (DLY20VA50P01)
 5 bar ±10% (DLY50VA50P01)
 7 bar ±10% (DLY70VA50P01)
 9,5 bar ±10% (DLY95VA50P01)

Electrical/Visual Differential Indicator

Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: FPM

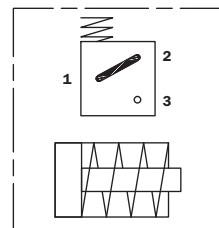
Technical data:

- Indicator type: Electrical/Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25 °C to +110 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

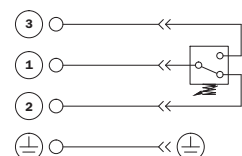
Electrical data:

- Resistive load: 5 A / 250 VAC
- Electrical connections: 50 - EN 175301-803
- Protection degree: IP 65 in according to EN 60529

HYDRAULIC SYMBOL

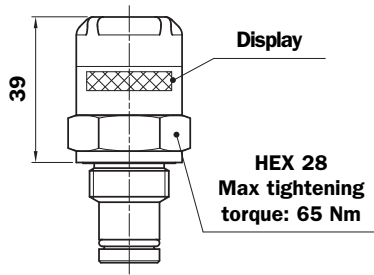


ELECTRICAL SYMBOL



STAINLESS STEEL DIFFERENTIAL INDICATORS

DVX



Available setting:

- 1,2 bar $\pm 10\%$ (DVX12xP01)
- 2 bar $\pm 10\%$ (DVX20xP01)
- 5 bar $\pm 10\%$ (DVX50xP01)
- 7 bar $\pm 10\%$ (DVX70xP01)
- 9,5 bar $\pm 10\%$ (DVX95xP01)

Visual Differential Indicator

Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Nylon
- Seals: HNBR - MFQ

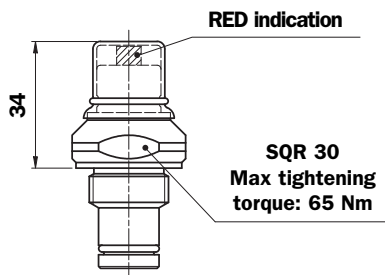
Technical data:

- Indicator type: Visual differential indicator with automatic reset
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25°C to $+110^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

HYDRAULIC SYMBOL



DVY



Available setting:

- 1,2 bar $\pm 10\%$ (DVY12xP01)
- 2 bar $\pm 10\%$ (DVY20xP01)
- 5 bar $\pm 10\%$ (DVY50xP01)
- 7 bar $\pm 10\%$ (DVY70xP01)
- 9,5 bar $\pm 10\%$ (DVY95xP01)

Visual Differential Indicator

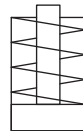
Materials:

- Body: AISI 316L
- Internal parts: AISI 316L - Aluminium
- Seals: HNBR - MFQ

Technical data:

- Indicator type: Visual differential indicator
- Max working pressure: 420 bar
- Proof pressure: 630 bar
- Burst pressure: 1260 bar
- Working temperature: From -25°C to $+110^{\circ}\text{C}$
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC fluids in according to ISO 2943

HYDRAULIC SYMBOL



Series	1	2	3	4	5	6	7
DE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	DE	X	20	H	A	50	P01

Series	1	2	3	4	5	6	7
DL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	DL	X	20	H	A	52	P01

Series	1	2	3	4	7
DV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Example:	DV	X	20	H	P01

1 - Series

- DE** Electrical indicator
- DL** Electrical/Visual indicator
- DV** Visual indicator

2 - Type

- X** Standard type
- Y** Optional type

3 - Setting pressure

- 12** 1,5 bar
- 20** 2 bar
- 50** 5 bar
- 70** 7 bar
- 95** 9,5 bar

4 - Seals

- H** HNBR
- F** MFQ
- On request

5 - Thermostat (excluded for DV)

- A** Without thermostat

6 - Electrical connection (excluded for DV)

DEX series

- 50** EN 175301-803 connector

DLA series

- 51** EN 175301-803 clear connector with 24 V lamps
- 52** EN 175301-803 clear connector with 110 V lamps
- 71** M12 IEC 61076-2-101 clear connector with 24 V lamps

7 - Option

- P01** MP Filtri standard
- Pxx** Customer request

VACUUM INDICATORS

Old code	New code
E0	VED20AA50P01
E0P01	VEB21AA50P01
E1	VEC20AA50P01
E1P01	VEA21AA50P01
E1P02	VEA21AA05P01
-	-
-	VVS16P01
VP01	VVR16P01
VOP01	VVA16P01
VSP01	WVB16P01

BAROMETRIC INDICATORS

Old code	New code	Old code	New code
FE08H1AP01	BEA08HA50P01	VP15AMP01	BVQ15HP01
FE08H1BP01	BLA08HA51P01	VP20AAP01	BVP20HP01
FE15H1AP01	BEA15HA50P01	VP20AMP01	BVQ20HP01
FE15H1BP01	BLA15HA51P01	-	-
FE15H1DP01	BLA15HA53P01	VRP01	BVA14P01
FE15H1EP01	BEM15HA41P01	VR25P01	BVA25P01
FE20H1AP01	BEA20HA50P01	V1P01	BVR14P01
FE20H1BP01	BLA20HA51P01	-	BVR25P01
FE20H1CP01	BLA20HA52P01		
FE20H1DP01	BLA20HA53P01		
FE20H1EP01	BEM20HA41P01		
FE25H1AP01	BEA25HA50P01		
FE25H1BP01	BLA25HA51P01		
VP15AAP01	BVP15HP01		

STAINLESS STEEL DIFFERENTIAL INDICATORS

Old code	New code	Old code	New code
1EX	DLY12HA50P01 - DLY12VA50P01	VB6FP01	DVY20FP01
E6X	DLY20HA50P01 - DLY20VA50P01	VB6HP01	DVY20HP01
E6XE	DLY20EA50P01	VB7FP01	DVY50FP01
E7X	DLY50HA50P01 - DLY50VA50P01	VB7HP01	DVY50HP01
E8X	DLY70HA50P01 - DLY70VA50P01	VB7VP01	DVY50VP01
-	-	VB8EP01	DVY70EP01
K7X1HP01	DLX50HA51P01	VB8FP01	DVY70FP01
K8X1HP01	DLX70HA51P01	VB8HP01	DVY70HP01
-	-	-	-
N7X	DEX50HA50P01	1VX	DVX12HP01 - DVX12VP01
N7XEP01	DEX50EA50P01	V6X	DVX20HP01 - DVX20VP01
N8X	DEX70HA50P01	V7X	DVX50HP01 - DVX50VP01
N8XEP01	DEX70EA50P01	V7XE	DVX50EP01
		V8X	DVX70HP01 - DVX70VP01
		V8XE	DVX70EP01

DIFFERENTIAL INDICATORS

Old code	New code	Old code	New code
1E	DLE12HA50P01 - DLE12VA50P01	NM6HA11P01	DEM20HA10P01
E6	DLE20HA50P01 - DLE20VA50P01	NM6HA31P01	DEM20HA30P01
E6E	DLE20EA50P01	NM6HA36P01	DEM20HA31P01
E6H	DLE20HA50P01	NM7HA11P01	DEM50HA10P01
E7	DLE50HA50P01 - DLE50VA50P01	NM7HA21P01	DEM50HA20P01
E7E	DLE50EA50P01	NM7HA31P01	DEM50HA30P01
E7H	DLE50HA50P01	NM7HA32P01	DEM50HA35P01
E8	DLE70HA50P01 - DLE70VA50P01	NM7HC32P01	DEM50HF35P01
E8E	DLE70EA50P01	NM7VA11P01	DEM50VA10P01
E8H	DLE70HA50P01	NM7VC11P01	DEM50VF10P01
E9	DLE95HA50P01 - DLE95VA50P01	NM8HA11P01	DEM70HA10P01
E9E	DLE95EA50P01	NM8HA31P01	DEM70HA30P01
E9H	DLE95HA50P01	NM8HA36P01	DEM70HA32P01
-	-	-	-
J1	DLE12HF50P01 - DLE12VF50P01	NR2HP01	DEA12HA50P01
J6	DLE20HF50P01 - DLE20VF50P01	NR2VP01	DEA12VA50P01
J7	DLE50HF50P01 - DLE50VF50P01	NR6EP01	DEA20EA50P01
J8	DLE70HF50P01 - DLE70VF50P01	NR6HP01	DEA20HA50P01
J9	DLE95HF50P01 - DLE95VF50P01	NR6VP01	DEA20VA50P01
-	-	NR7HP01	DEA50HA50P01
KR21HP01	DLA12HA51P01	NR7VP01	DEA50VA50P01
KR21VP01	DLA12VA51P01	NR8EP01	DEA70EA50P01
KR31HP01	DLA30HA51P01	NR8HP01	DEA70HA50P01
KR61HP01	DLA20HA51P01	NR8VP01	DEA70VA50P01
KR61VP01	DLA20VA51P01	NR9HP01	DEA95HA50P01
KR62HP01	DLA20HA52P01	NR9VP01	DEA95VA50P01
KR62VP01	DLA20VA52P01	-	-
KR71HP01	DLA50HA51P01	U3HP01	DVM30HP01
KR71VP01	DLA50VA51P01	U6HP01	DVM20HP01
KR72HP01	DLA50HA52P01	U6VP01	DVM20VP01
KR72VP01	DLA50VA52P01	U7HP01	DVM50HP01
KR81HP01	DLA70HA51P01	U7VP01	DVM50VP01
KR81VP01	DLA70VA51P01	U8VP01	DVM70VP01
KR82HP01	DLA70HA52P01	-	-
KR91HP01	DLA95HA51P01	1V	DVA12HP01 - DVA12VP01
-	-	V6	DVA20HP01 - DVA20VP01
NE2HTP01	DTA12HF70P01	V6E	DVA20EP01
NE2VSP01	DTA12VF70P01	V6H	DVA20HP01
NE6HSP01	DTA20HF70P01	V7	DVA50HP01 - DVA50VP01
NE6HTP01	DTA20HF70P01	V7E	DVA50EP01
NE6VSP01	DTA20VF70P01	V7H	DVA50HP01
NE6VTP01	DTA20VF70P01	V8	DVA70HP01 - DVA70VP01
NE7HSP01	DTA50HF70P01	V8E	DVA70EP01
NE7HTP01	DTA50HF70P01	V9	DVA95HP01 - DVA95VP01
NE7VSP01	DTA50VF70P01	V9E	DVA95EP01
NE7VTP01	DTA50VF70P01	-	-
NE8HSP01	DTA70HF70P01	Z2HP01	DVM12HP01
NE8HTP01	DTA70HF70P01	Z2VP01	DVM12VP01
NE8VSP01	DTA70VF70P01	Z6EP01	DVM20EP01
NE8VTP01	DTA70VF70P01	Z6HP01	DVM20HP01
NE9VTP01	DTA95VF70P01	Z6VP01	DVM20VP01
-	-	Z7HP01	DVM50HP01
NE9VTP01	DTA95VF70P01	Z7VP01	DVM50VP01
-	-	Z7XHP01	DVY70HP01
-	-	Z8EP01	DVM70EP01
-	-	Z8HP01	DVM70HP01
-	-	Z8VP01	DVM70VP01
-	-	Z9HP01	DVM95HP01