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Россия +7(495)268-04-70
Казахстан +(727)345-47-04
Беларусь +(375)257-127-884
Узбекистан +998(71)205-18-59
Киргизия +996(312)96-26-47

эл.почта: mqt@nt-rt.ru || сайт: https://mpfiltri.nt-rt.ru/

FHM GENERAL INFORMATION

Description

High Pressure filters

Manifold
Maximum working pressure up to 32 MPa (320 bar)
Flow rate up to 400 l/min

FHM is a range of high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines.
They are directly connected to the top of the manifold, through the proper flanged interface.

Available features:

Available features:
- Manifold connections up to Ø30 mm, for a maximum flow rate of 400 l/min
- ISO 4401 CETOP 3 and CETOP 5 interface, for direct mounting on the CETOP valves
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:

Delivery lines, in any high pressure industrial equipment

Technical data

Filter housing materials

- Head
  Phosphatized cast iron: FHM 006-007-010
  Phosphatized steel: FHM 050-065-135-320-500

- Housing: Phosphatized steel

- Bypass valve: Steel

- Check valve: Steel

Pressure

- Test pressure: 48 MPa (480 bar)
- Burst pressure: 96 MPa (960 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 32 MPa (320 bar)

Bypass valve

- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N: 20 bar
  (not available for FHM 006, FHM 007 and FHM 010)
- Microfibre filter elements - series H: 210 bar
  (not available for FHM 050 and FHM 500)
- Microfibre filter elements - series S: 210 bar
  (only for FHM 050 and FHM 500)
- Wire mesh filter elements - series N: 20 bar
  (not available for FHM 006)
- Wire mesh filter elements - series H: 210 bar
  (not available for FHM 050 and FHM 500)
- Fluid flow through the filter element from OUT to IN

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

Connections

Manifold mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]					Volumes [dm³]				
	Length 1	2	3	4	5	Length 1	2	3	4	5
FHM 006	2.17	-	-	-	-	0.12	-	-	-	-
FHM 007	-	4.74	5.95	-	-	-	0.30	0.50	-	-
FHM 010	-	4.74	5.95	-	-	-	0.30	0.50	-	-
FHM 050	5.31	5.68	6.09	6.56	7.74	0.29	0.38	0.48	0.60	0.89
FHM 065	5.47	5.83	7.04	-	-	0.27	0.34	0.56	-	-
FHM 135	8.78	10.38	11.43	-	-	0.49	0.82	1.03	-	-
FHM 320	19.80	21.93	24.22	26.70	-	1.04	1.76	2.53	3.36	-
FHM 500	35.00	39.17	42.69	54.70	60.50	1.63	2.35	2.96	5.11	6.44

Flow rates [l/min]

		Filter element design - H Series					
Filter series	Length	A03	A06	A10	A16	A25	M25
FHM 006	**1**	9	10	13	14	15	16
FHM 007	**2**	13	13	15	16	16	16
	3	15	15	16	16	17	17
FHM 010	**2**	23	25	32	34	37	38
	3	31	33	37	38	39	40

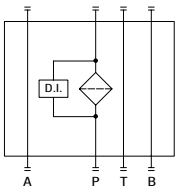
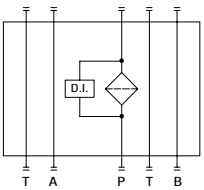
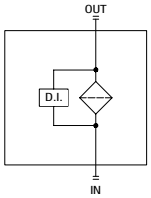
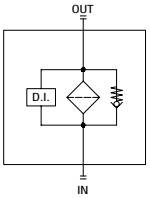
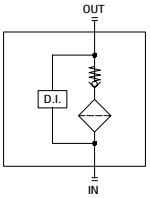
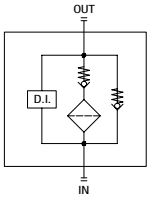
		Filter element design - N Series						Filter element design - S Series				
Filter series	Length	A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHM 050	**1**	38	37	65	67	81	101	28	36	50	52	62
	2	46	50	69	75	89	102	41	44	63	71	85
	3	57	59	76	81	93	103	51	53	71	77	90
	4	68	71	84	86	95	103	62	66	81	82	93
	5	82	83	93	95	98	105	73	75	83	89	97

		Filter element design - N Series						Filter element design - H Series				
Filter series	Length	A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHM 065	**1**	23	30	48	53	71	102	22	23	43	50	67
	2	30	45	59	64	81	103	30	34	56	62	76
	3	52	60	78	82	92	105	51	58	77	81	91
FHM 135	**1**	61	65	99	104	131	149	46	51	83	86	122
	2	91	96	118	119	155	167	79	92	109	111	134
	3	118	119	144	146	156	168	103	112	130	137	146
FHM 320	**1**	112	121	187	217	252	312	97	102	156	162	228
	2	200	214	281	293	320	328	161	181	237	241	282
	3	245	267	312	320	325	333	207	233	275	280	306
	4	267	281	315	325	336	341	232	247	279	283	309

		Filter element design - N Series						Filter element design - S Series				
Filter series	Length	A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
FHM 500	**1**	211	232	281	289	309	394	126	135	208	210	261
	2	242	262	303	308	330	397	187	206	258	266	285
	3	284	294	336	338	357	399	226	230	285	290	315
	4	302	325	346	350	361	401	251	273	314	315	341
	5	325	334	356	361	373	401	296	301	335	338	360

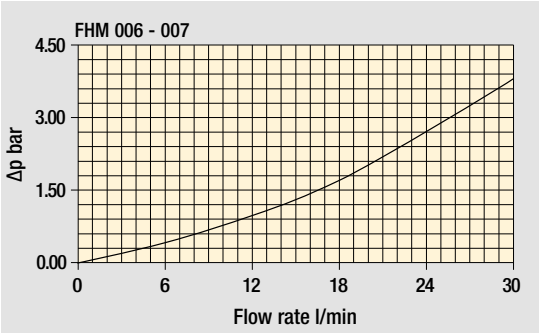
Maximum flow rate for a complete pressure filter with a pressure drop Δp = 1.5 bar.

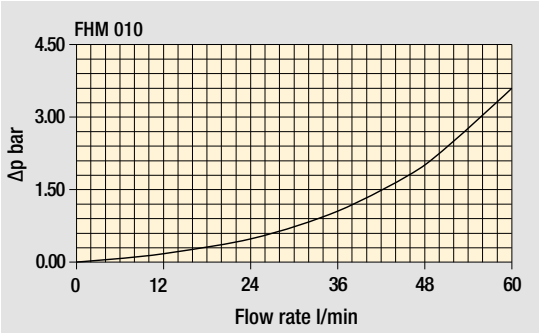
Hydraulic symbols

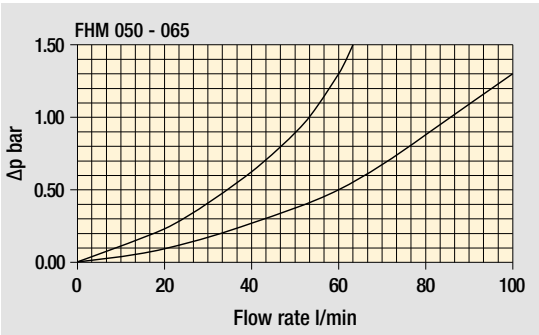
Filter series	Stile S	Stile S	Stile S	Stile B	Stile T	Stile D
FHM 006	•	-	-	-	-	-
FHM 007	•	-	-	-	-	-
FHM 010	-	•	-	-	-	-
FHM 050	-	-	•	•	•	•
FHM 065	-	-	•	•	•	•
FHM 135	-	-	•	•	•	•
FHM 320	-	-	•	•	•	•
FHM 500	-	-	•	•	•	•
						

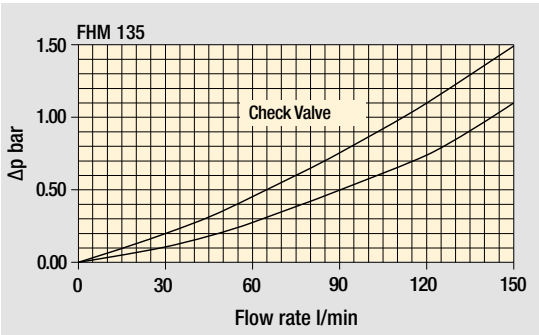
Pressure drop

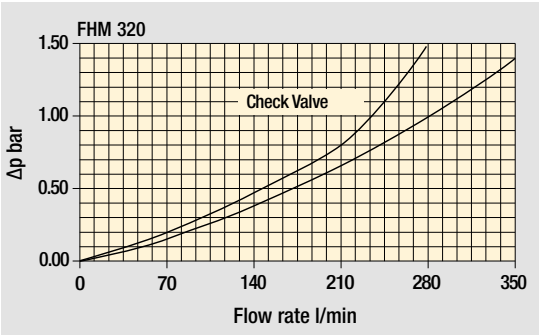
Filter housings Δp pressure drop

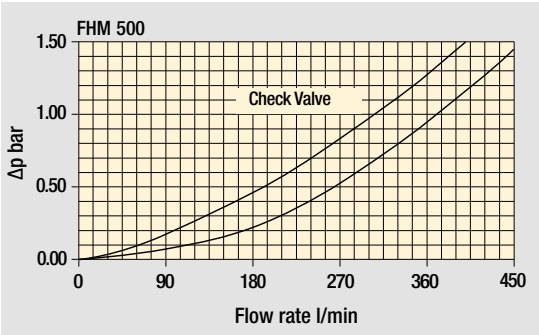




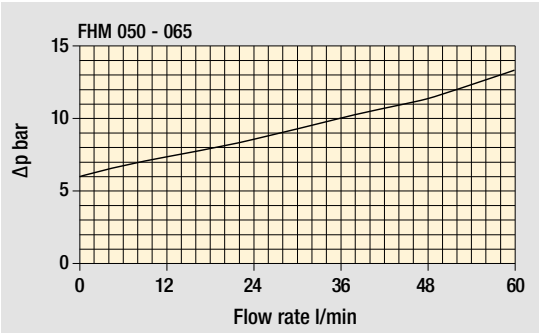


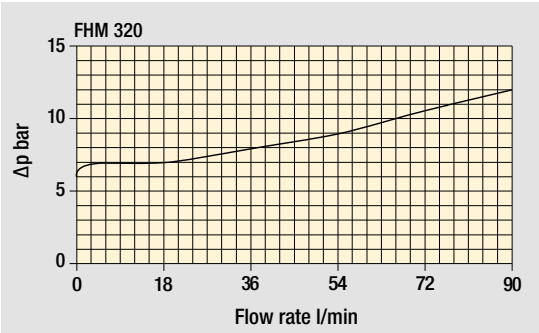


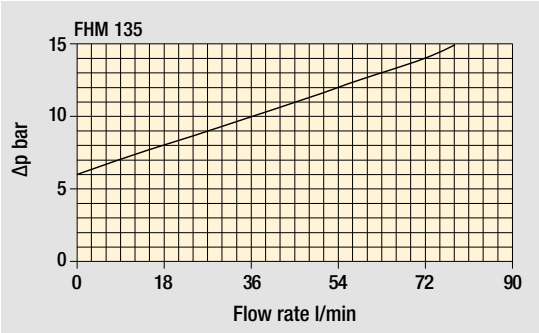




Bypass valve pressure drop







The curves are plotted using mineral oil with density of 0.86 kg/dm^3 in compliance with ISO 3968. Δp varies proportionally with density.

FHM FHM006 - FHM007 - FHM010

Designation & Ordering code

COMPLETE FILTER

Configuration example: FHM010 | 2 | S | V | G1 | A03 | H | P01

Series and size

FHM006 | **FHM007** | **FHM010**

Length	FHM006	FHM007	FHM010
1	•	-	-
2	-	•	•
3	-	•	•

Valves

S Without bypass

Seals

A NBR
V FPM

Connections

G1 Manifold side “A”
G2 Manifold side “B”

Filtration rating (filter media)

A03	Inorganic microfiber 3 µm	**A16**	Inorganic microfiber 16 µm
A06	Inorganic microfiber 6 µm	**A25**	Inorganic microfiber 25 µm
A10	Inorganic microfiber 10 µm	**M25**	Wire mesh 25 µm

Element Δp

H 210 bar

Execution

P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Configuration example: HP065 | 2 | A03 | A | H | P01

Element series and size

	FHM006	FHM007	FHM010
HP011	•	-	-
HP065	-	•	•

Element length	FHM006	FHM007	FHM010
2	-	•	•
3	•	•	•

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals

A NBR
V FPM

Element Δp

H 210 bar

Execution

P01 MP Filtri standard
Pxx Customized

CLOGGING INDICATORS

See page 727

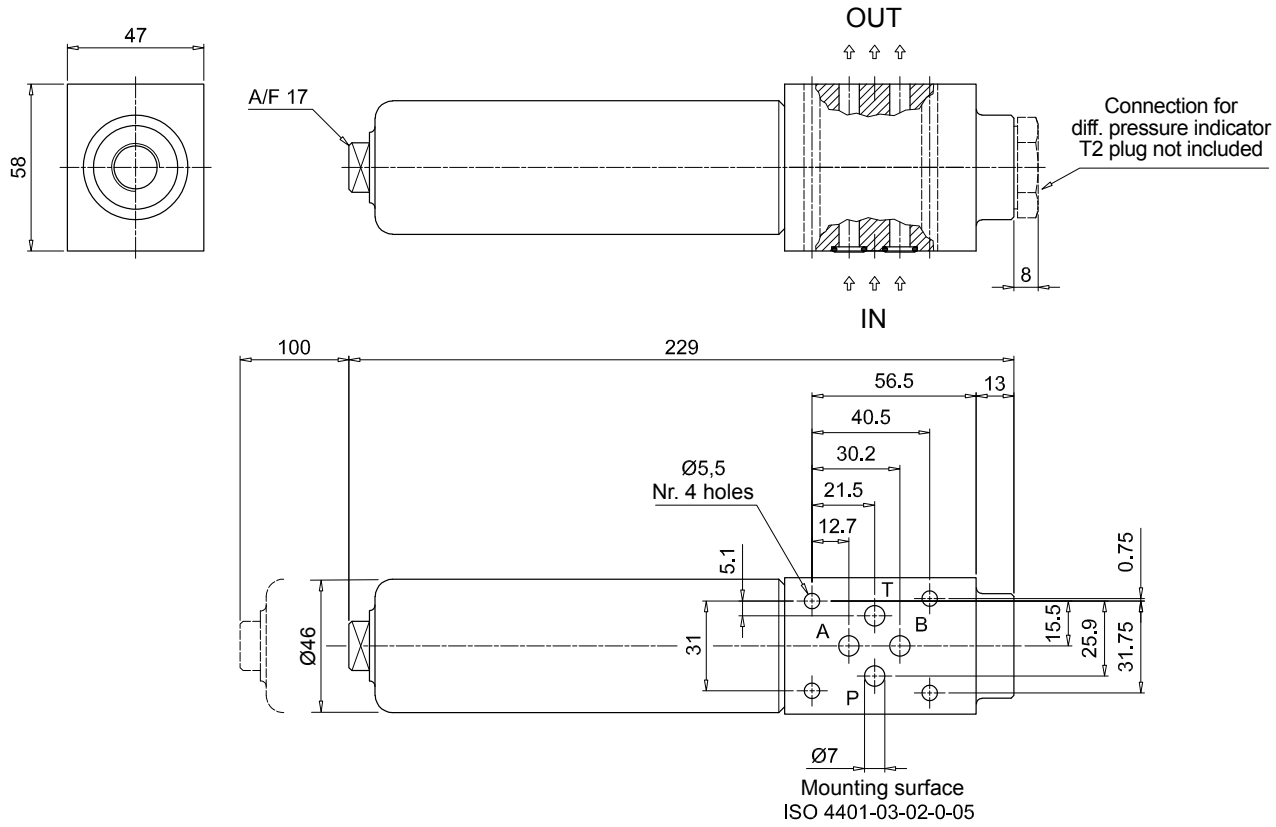
DEA Electrical differential pressure indicator
DEM Electrical differential pressure indicator
DEU Electrical differential pressure indicator
DLA Electrical / visual differential pressure indicator
DLE Electrical / visual differential pressure indicator
DTA Electronic differential pressure indicator
DVA Visual differential pressure indicator
DVM Visual differential pressure indicator

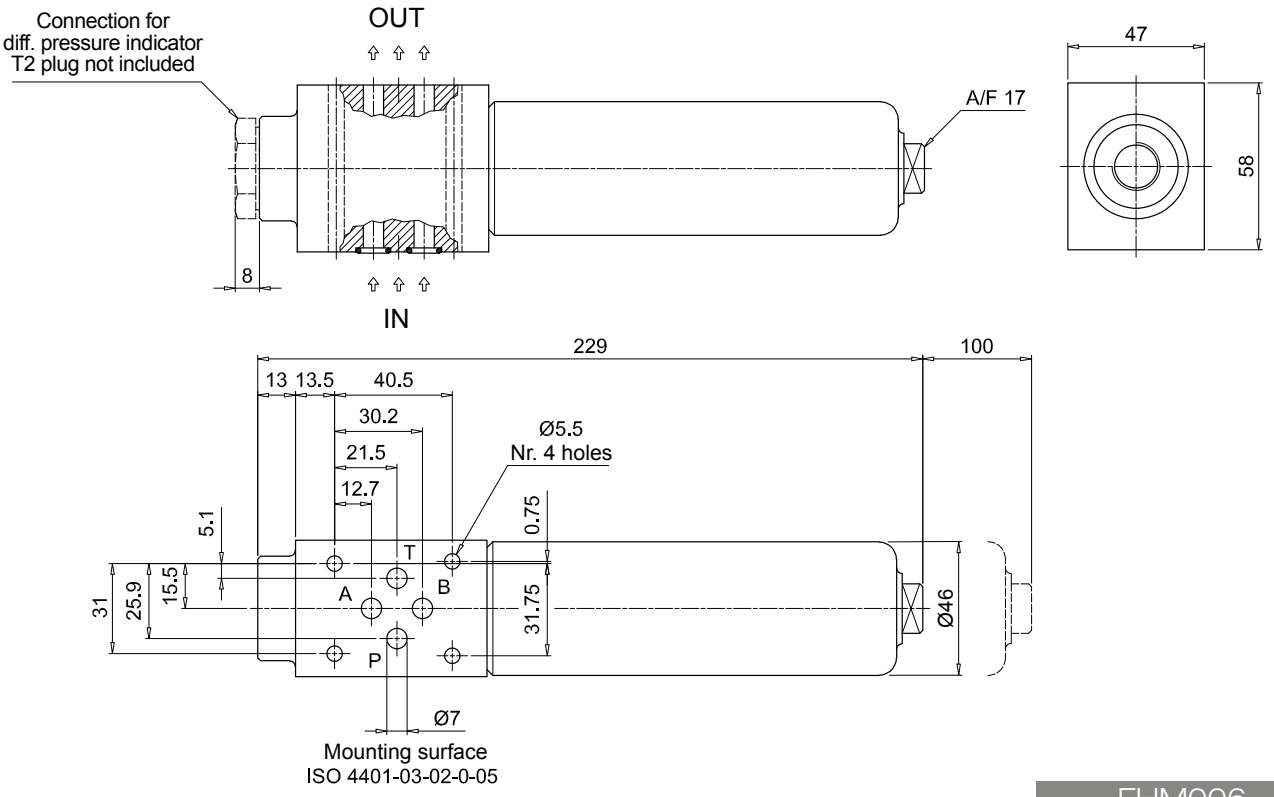
PLUGS

See page 747

T2 Plug (not included)

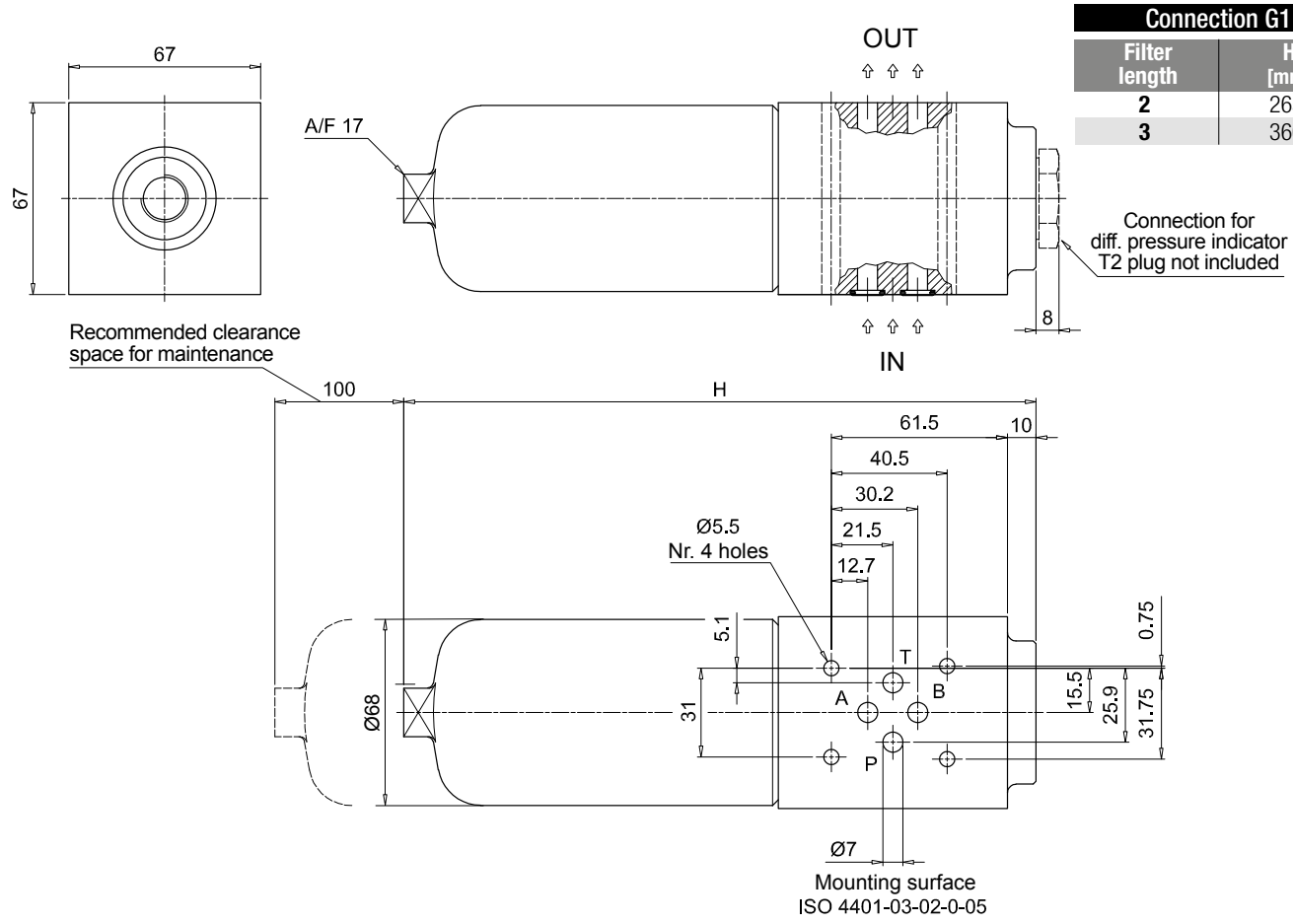
FHM006
Connection G1



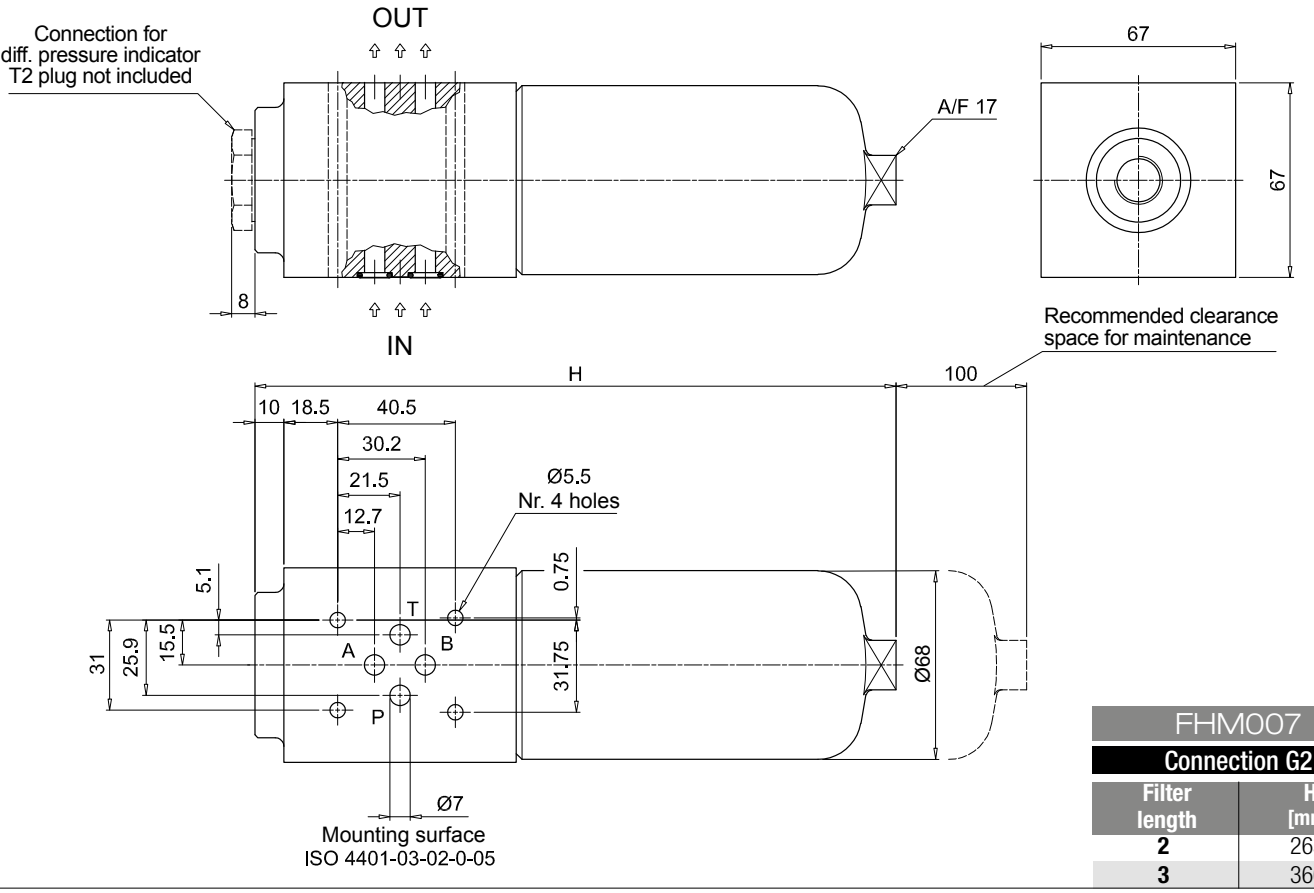


FHM006
Connection G2

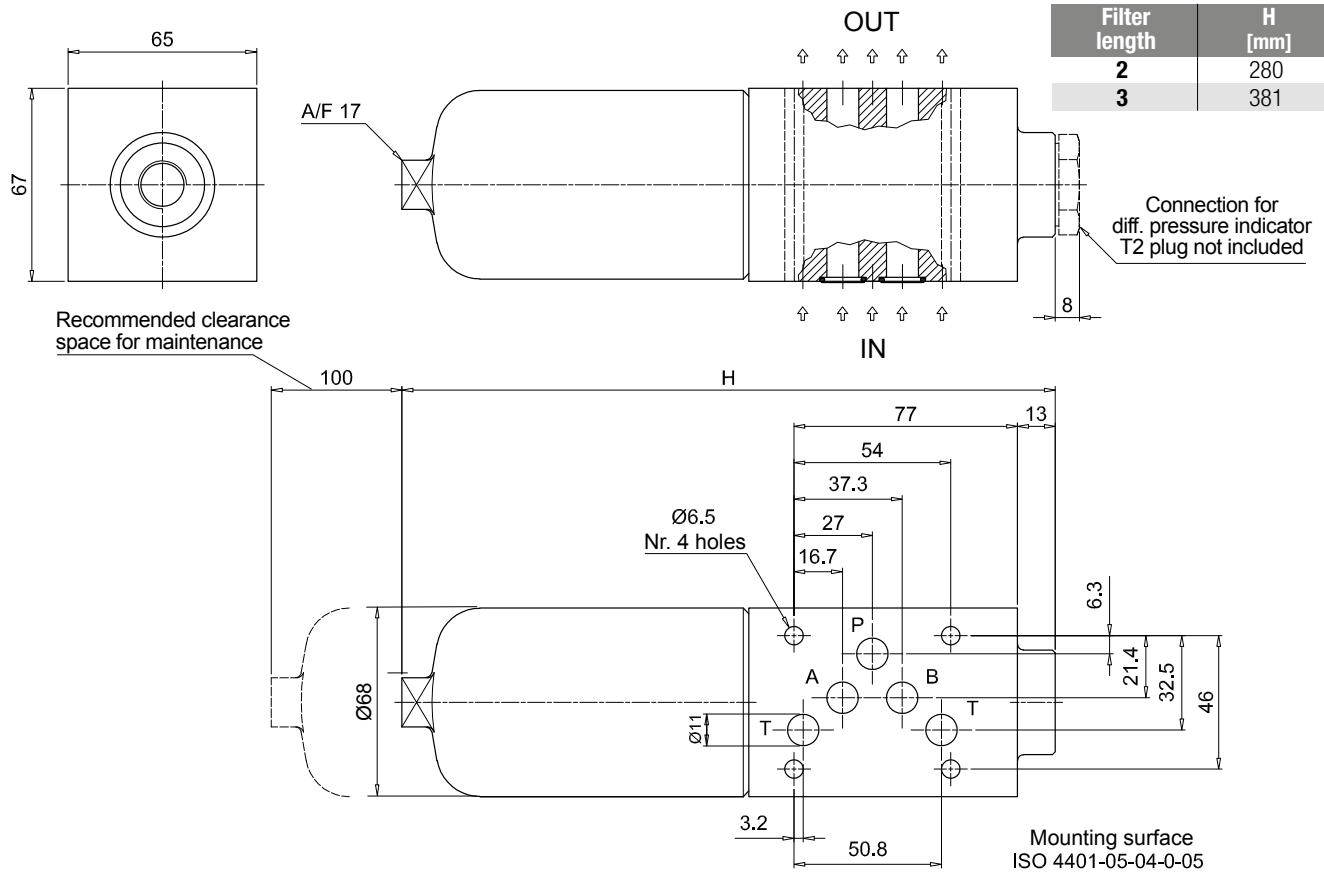
Dimensions



FHM007	
Connection G1	
Filter length	**H [mm]**
2	265
3	366



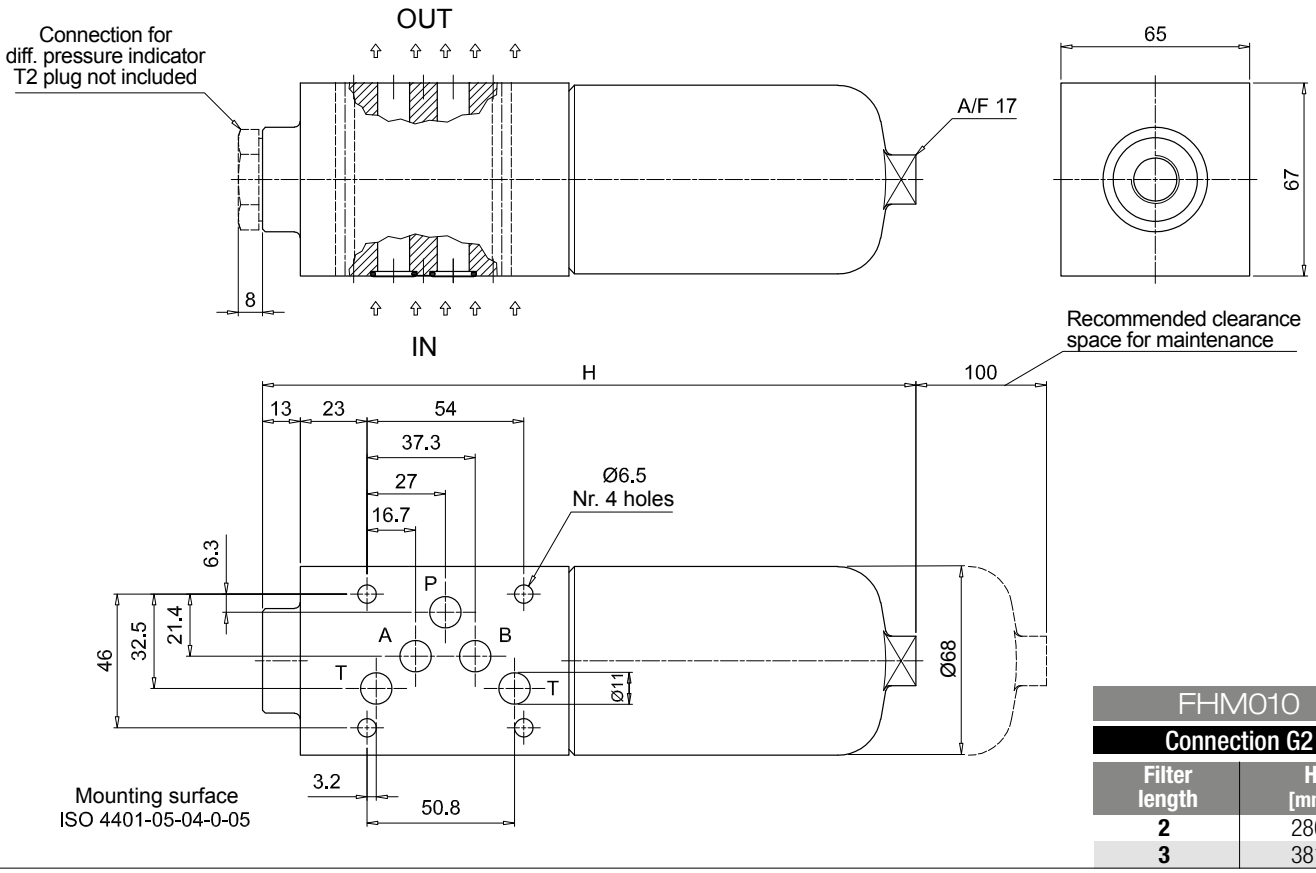
FHM007	
Connection G2	
Filter length	**H [mm]**
2	265
3	366



FHM010

Connection G1

Filter length	H [mm]
2	280
3	381



FHM010

Connection G2

Filter length	H [mm]
2	280
3	381

FHM FHM050 - FHM065 - FHM135

Designation & Ordering code

COMPLETE FILTER

Configuration example: FHM135 | 3 | S | A | F1 | A10 | H | P01

Series and size

FHM050 | **FHM065** | **FHM135**

Length	FHM050	FHM065	FHM135
1	•	•	•
2	•	•	•
3	•	•	•
4	•	-	-
5	•	-	-

Valves

S	Without bypass
B	With bypass 6 bar
T	With check valve, without bypass
D	With check valve, with bypass 6 bar

Seals

A	NBR
V	FPM

Connections

F1	Manifold

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Valves:	FHM050				FHM065-135			
Element Δp	S	B	T	D	S	B	T	D
N 20 bar	-	•	-	•	-	•	-	•
H 210 bar	-	-	-	-	•	-	•	-
S 210 bar	•	-	•	-	-	-	-	-

Execution

P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

Configuration example: HP135 | 3 | A10 | A | H | P01

Element series and size

HP050 | **HP065** | **HP135**

Element length	HP050	HP065	HP135
1	•	•	•
2	•	•	•
3	•	•	•
4	•	-	-
5	•	-	-

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals

A	NBR
V	FPM

Element Δp	HP050	HP065	HP135
N 20 bar	•	•	•
H 210 bar	-	•	•
S 210 bar	•	-	-

Execution

P01	MP Filtri standard
Pxx	Customized

CLOGGING INDICATORS

See page 727

DEA	Electrical differential pressure indicator
DEM	Electrical differential pressure indicator
DEU	Electrical differential pressure indicator
DLA	Electrical / visual differential pressure indicator
DLE	Electrical / visual differential pressure indicator
DTA	Electronic differential pressure indicator
DVA	Visual differential pressure indicator
DVM	Visual differential pressure indicator

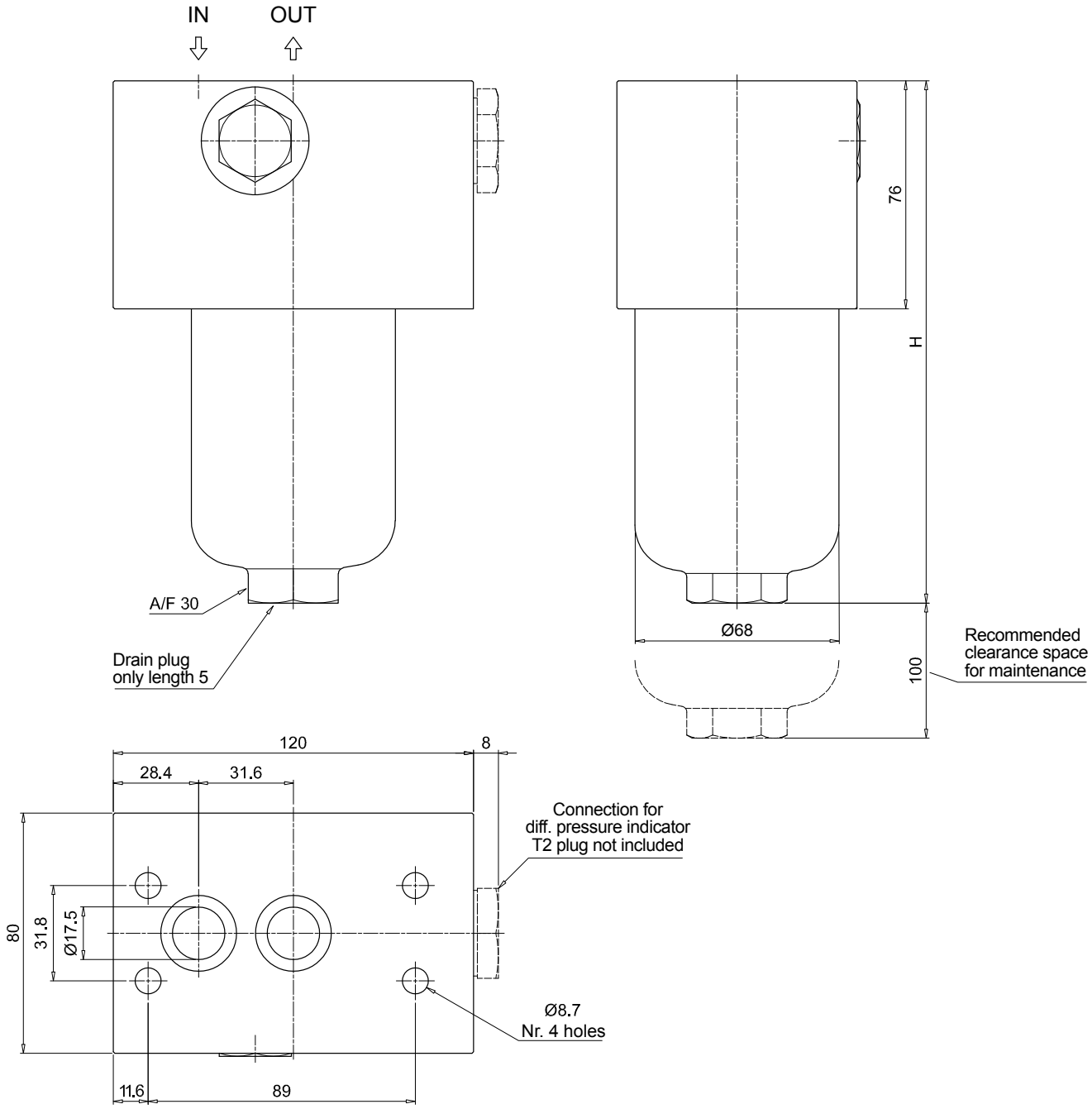
PLUGS

See page 747

T2	Plug (not included)

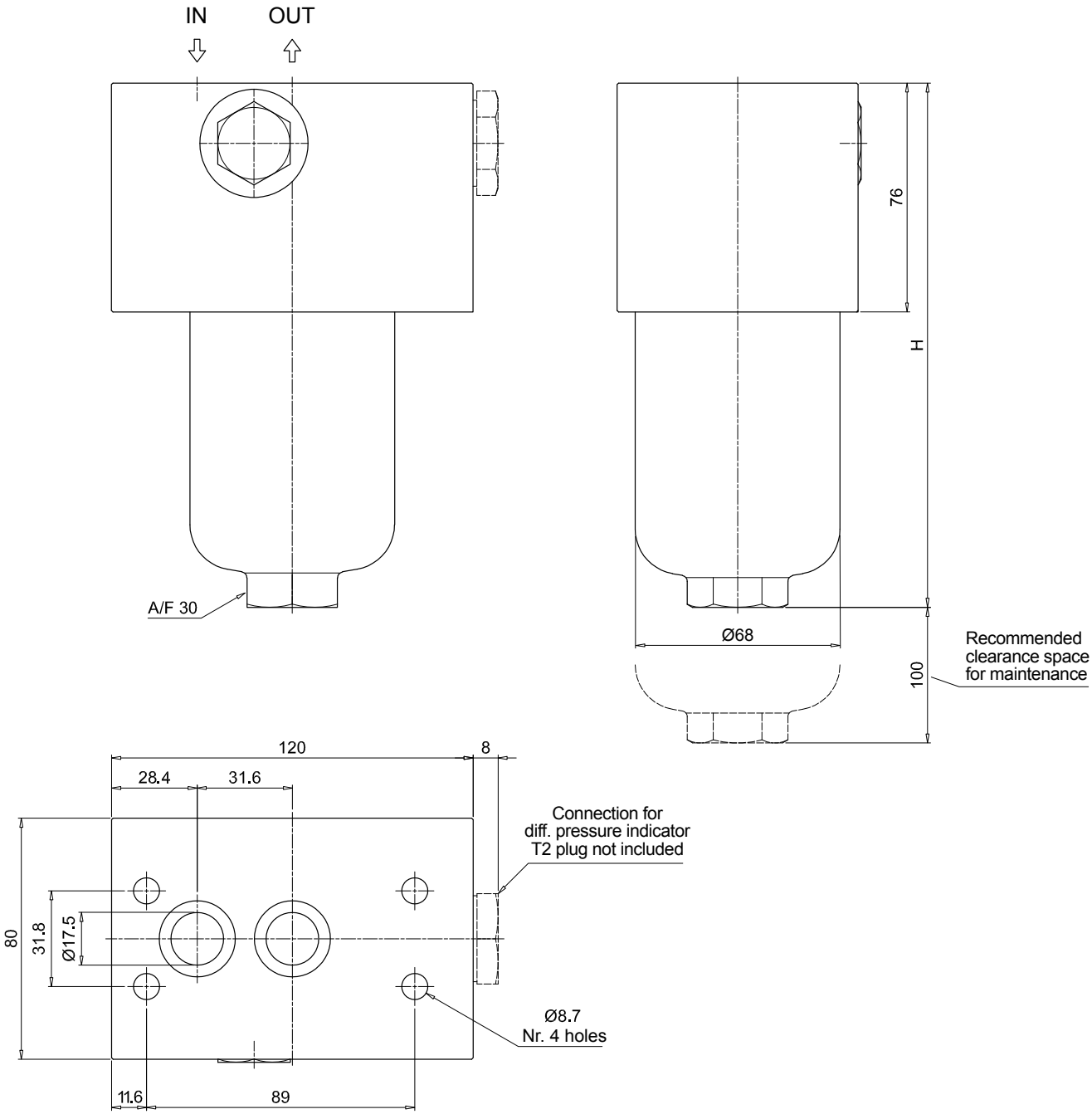
Dimensions

FHM050	
Filter length	**H [mm]**
1	154
2	191
3	233
4	281
5	403

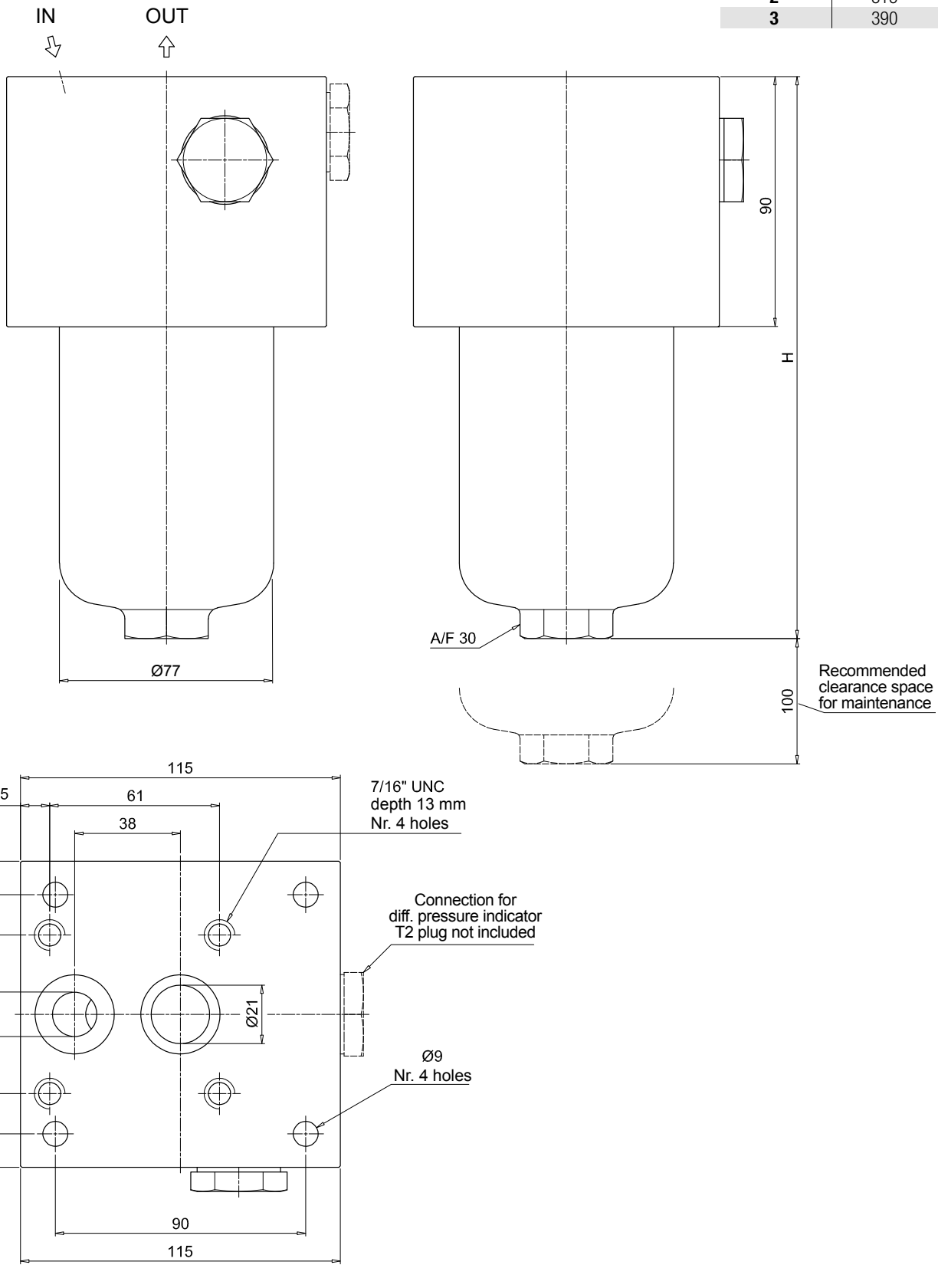


Dimensions

FHM065	
Filter length	**H [mm]**
1	162
2	193
3	295



FHM135	
Filter length	**H [mm]**
1	202
2	315
3	390



Designation & Ordering code

COMPLETE FILTER

Configuration example: FHM320 | 4 | D | A | F1 | A06 | N | P01

Series and size

FHM320 | **FHM500**

Length	FHM320	FHM500
1	•	•
2	•	•
3	•	•
4	•	•
5	-	•

Valves

S	Without bypass
B	With bypass 6 bar
T	With check valve, without bypass
D	With check valve, with bypass 6 bar

Seals

A	NBR
V	FPM

Connections

F1	Manifold

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm	**A16**	Inorganic microfiber	16 µm
A06	Inorganic microfiber	6 µm	**A25**	Inorganic microfiber	25 µm
A10	Inorganic microfiber	10 µm	**M25**	Wire mesh	25 µm

Valves:	FHM320				FHM500			
Element Δp	S	B	T	D	S	B	T	D
N 20 bar	-	•	-	•	-	•	-	•
H 210 bar	•	-	•	-	-	-	-	-
S 210 bar	-	-	-	-	•	-	•	-

Execution	Filter length 1	2	3	4	5
P01 MP Filtri standard	•	•	•	•	•
P02 Maintenance from the bottom of the housing				•	•
Pxx Customized					

FILTER ELEMENT

Configuration example: HP320 | 4 | A06 | A | N | P01

Element series and size

HP320 | **HP500**

Element length	HP320	HP500
1	•	•
2	•	•
3	•	•
4	•	•
5		•

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals

A	NBR
V	FPM

Element Δp	HP320	HP500
N 20 bar	•	•
H 210 bar	•	-
S 210 bar	-	•

Execution

P01	MP Filtri standard
Pxx	Customized

CLOGGING INDICATORS

See page 727

DEA	Electrical differential pressure indicator	**DLE**	Electrical / visual differential pressure indicator
DEM	Electrical differential pressure indicator	**DTA**	Electronic differential pressure indicator
DEU	Electrical differential pressure indicator	**DVA**	Visual differential pressure indicator
DLA	Electrical / visual differential pressure indicator	**DVM**	Visual differential pressure indicator

PLUGS

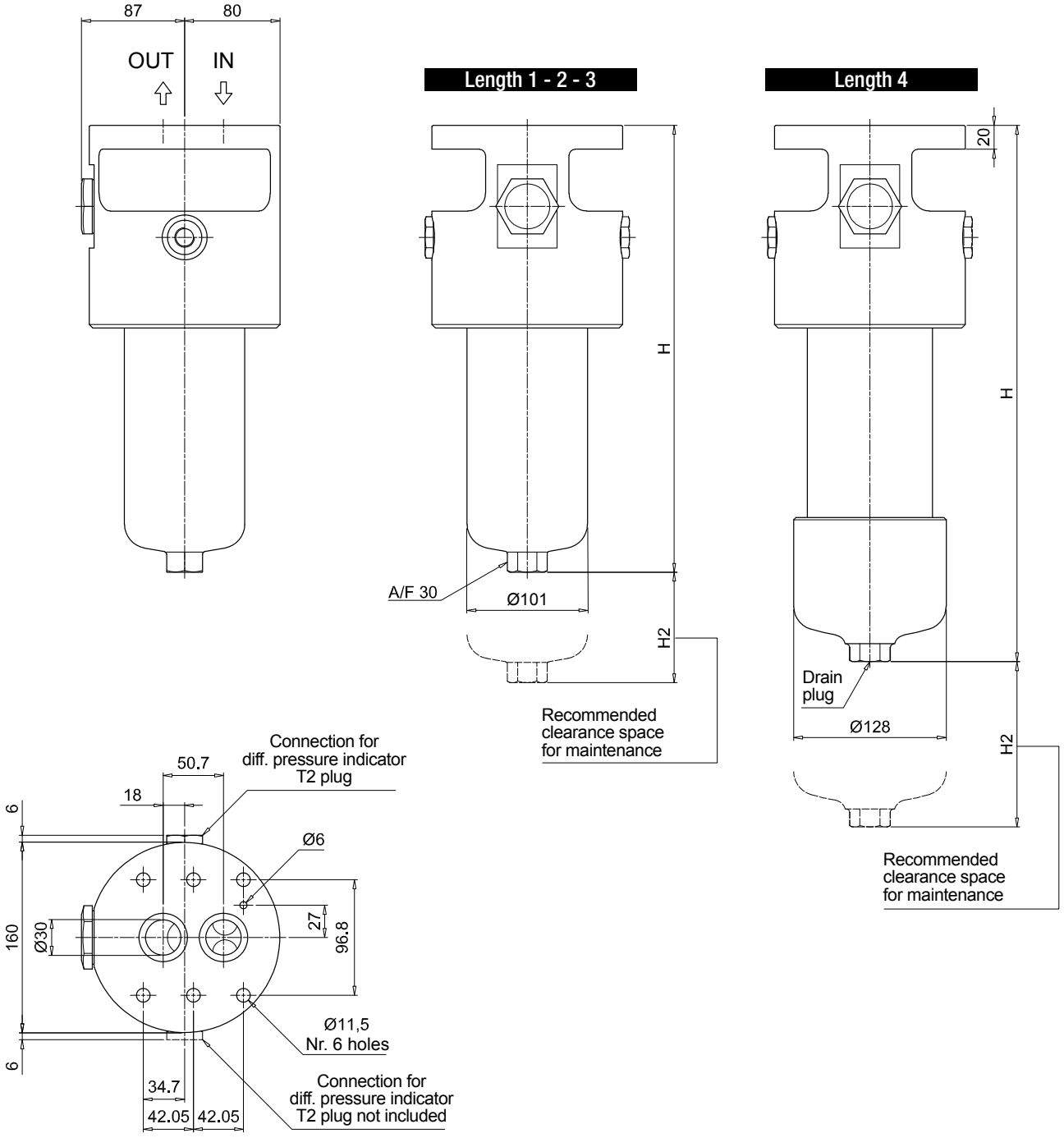
See page 747

T2	Plug (not included)

Dimensions

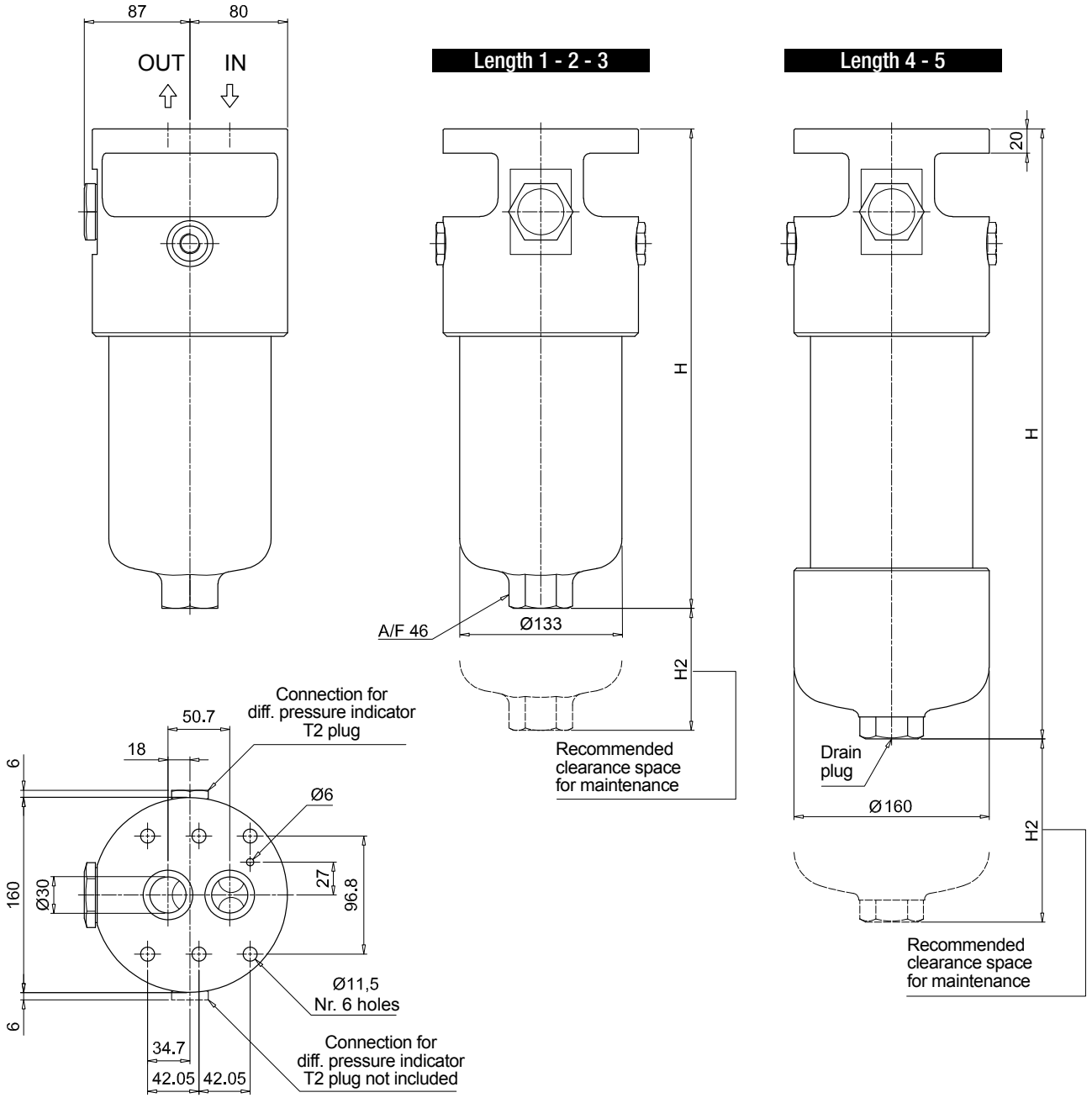
FHM320

Filter length	H [mm]	H2 [mm] Execution P01	P02
1	293	150	-
2	416	150	-
3	548	150	-
4	702	150	550



Dimensions

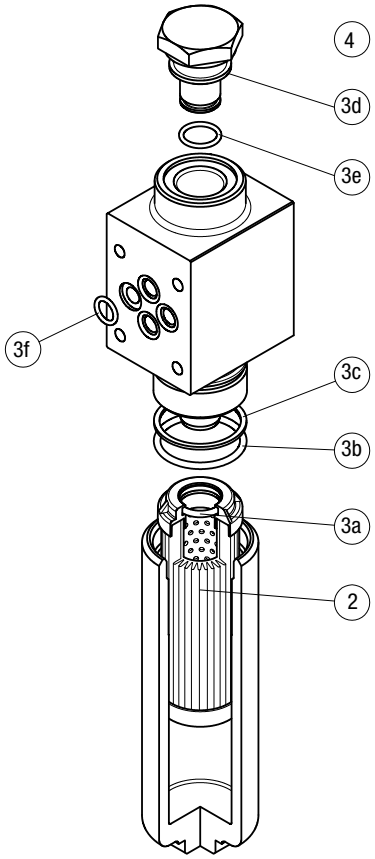
FHM500			
Filter length	H [mm]	H2 [mm] Execution P01	P02
1	355	150	-
2	445	150	-
3	521	150	-
4	679	150	480
5	845	150	650



FHM SPARE PARTS

Order number for spare parts

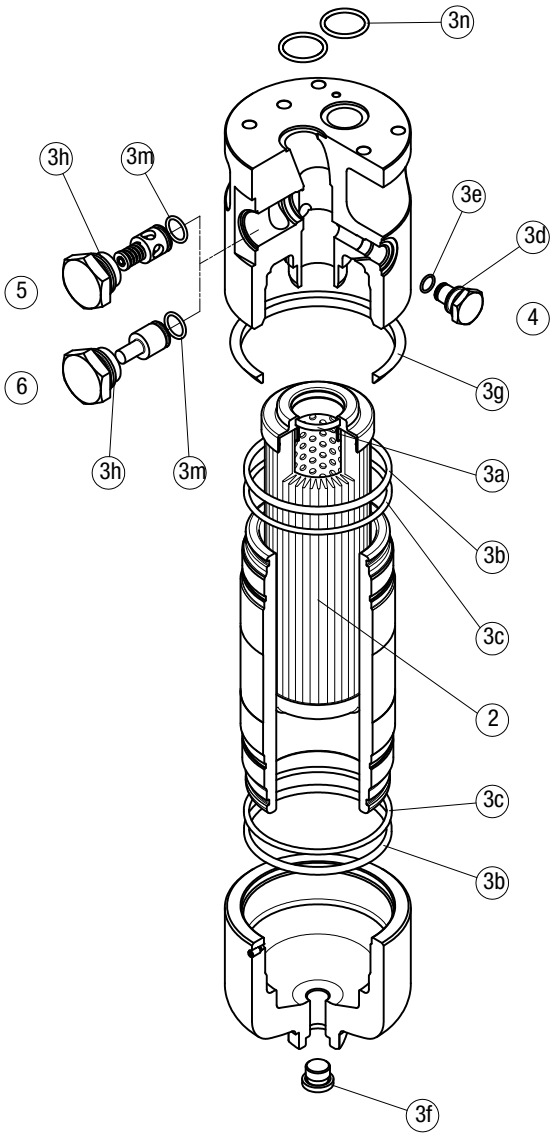
FHM 006 - 007 - 010



Item:	Q.ty: 1 pc. (2)	Q.ty: 1 pc. (3) (3a ÷ 3f)		Q.ty: 1 pc. (4)	
Filter series	Filter element	Seal Kit code number NBR	Seal Kit code number FPM	Indicator connection plug NBR	Indicator connection plug FPM
FHM 006	See order table	02050324	02050325	T2H	T2V
FHM 007		02050600	02050601		
FHM 010		02050320	02050321		

Order number for spare parts

FHM 050 - 065 - 135 - 320 - 500



Item:	Q.ty: 1 pc. (2)	Q.ty: 1 pc. (3) (3a ÷ 3m)		Q.ty: 1 pc. (4)		Q.ty: 1 pc. (5)		Q.ty: 1 pc. (6)	
Filter series	**Filter element**	**Seal Kit code number NBR**	**FPM**	**Indicator connection plug NBR**	**FPM**	**Bypass assembly NBR**	**FPM**	**Non-bypass assembly NBR**	**FPM**
FHM 050	See order table	02050410	02050411	T2H	T2V	02001400	02001401	02001402	02001403
FHM 065		02050268	02050279			02001400	02001401	02001402	02001403
FHM 135		02050271	02050282			02001404	02001405	02001406	02001407
FHM 320		02050275	02050286			02001408	02001409	02001410	02001411
FHM 500		02050332	02050333			02001408	02001409	02001410	02001411

DIFFERENTIAL PRESSURE INDICATORS

Configuration example 1:	DE	M	12	H	F	50	P01	
Configuration example 2:	DE	U	50	V	A	50	P01	UL
Configuration example 3:	DL	E	20	V	A	71	P01	
Configuration example 4:	DT	A	50	H	F	70	P01	
Configuration example 5:	DV	M	70	V			P01	

Series

DE Electrical differential pressure indicator
DL Electrical/Visual differential pressure indicator
DT Electronic differential pressure indicator
DV Visual differential pressure indicator

Type	DE	DL	DT	DV
A Standard type	•	•	•	**A** With automatic reset
M With wired electrical connection	•	-	-	**M** With manual reset
U Standard type 210 bar, UL certified	•	-	-	
E For high power supply	-	•	-	

Pressure setting	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
50 5.0 bar	•	•	•	•	•	•	•	•
70 7.0 bar	•	•	•	•	•	•	•	•
95 9.5 bar	•	•	-	•	•	•	•	•

Seals	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
H HNBR	•	•	-	•	•	•	•	•
V FPM	•	•	•	•	•	•	•	•

Thermostat	DEA	DEM	DEU	DLA	DLE	DT
A Without thermostat	•	•	•	•	•	-
F With thermostat	-	•	-	-	•	•

Electrical connections	DEA	DEM	DEU	DLA	DLE	DT
10 Connection AMP Superseal series 1.5	-	•	-	-	-	-
20 Connection AMP Timer Junior	-	•	-	-	-	-
30 Connection Deutsch DT-04-2-P	-	•	-	-	-	-
35 Connection Deutsch DT-04-3-P	-	•	-	-	-	-
50 Connection EN 175301-803	•	-	•	-	•	-
51 Connection EN 175301-803, transparent base with lamps 24 Vdc	-	-	-	•	-	-
52 Connection EN 175301-803, transparent base with lamps 110 Vdc	-	-	-	•	-	-
70 Connection IEC 61076-2-101 D (M12)	-	-	-	-	-	•
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc	-	-	-	•	-	-

Option

P01 MP Filtri standard
Pxx Customized

Certifications	DEU	OTHERS
Without	-	•
UL UL certification	•	-

PLUGS

Configuration example	T2	H

Series

T2 Plug

Seals

H HNBR
V FPM

FHB GENERAL INFORMATION

Description

High Pressure filters

Manifold
Maximum working pressure up to 32 MPa (320 bar)
Flow rate up to 485 l/min

FHB is a range of high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly connected to the side of the manifold, through the proper flanged interface.

Available features:
- Manifold connections up to Ø30 mm, for a maximum flow rate of 485 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:
Delivery lines, in any high pressure industrial equipment or mobile machines

Technical data

Filter housing materials
- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Bypass valve: Steel
- Check valve: Steel

Pressure
- Working pressure: 32 MPa (320 bar)
- Test pressure: 48 MPa (480 bar)
- Burst pressure: 96 MPa (960 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 32 MPa (320 bar)

Bypass valve
- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element type
- Microfibre filter elements - series N: 20 bar
- Microfibre filter elements - series H: 210 bar (not available for FHB050)
- Microfibre filter elements - series S: 210 bar (only for FHB050)
- 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

Temperature
From -25 °C to +110 °C

Connections
Manifold mounting

Note
FHB filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]						Volumes [dm³]					
	Length	1	2	3	4	5	Length	1	2	3	4	5
FHB 050		2.61	2.98	3.39	3.86	5.04		0.21	0.30	0.40	0.52	0.81
FHB 065		3.33	3.69	4.90	-	-		0.20	0.27	0.49	-	-
FHB 135		6.61	8.21	9.21	-	-		0.40	0.73	0.94	-	-
FHB 320		12.95	15.08	17.37	26.77	-		0.91	1.63	2.40	3.59	-

Flow rates [l/min]

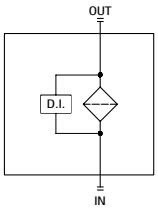
		Filter element design - N Series						Filter element design - S Series				
Filter series	Length	A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
	1	43	42	79	81	101	131	30	40	58	60	74
	2	53	58	84	93	112	132	46	50	76	86	108
FHB 050	**3**	67	70	94	101	119	133	59	62	87	95	115
	4	82	87	106	108	122	134	74	80	101	103	119
	5	102	104	119	122	127	136	90	92	105	113	126

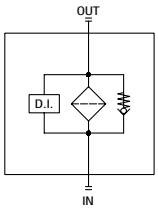
		Filter element design - N Series						Filter element design - H Series				
Filter series	Length	A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
	1	25	33	55	62	87	133	23	25	49	58	81
	2	33	51	70	76	101	134	33	38	66	75	94
FHB 065	**3**	60	71	97	103	118	138	60	68	95	102	116
	1	67	72	120	129	177	212	49	55	97	100	160
FHB 135	**2**	109	116	152	154	224	250	90	110	137	140	182
	3	153	155	201	205	226	253	126	142	175	187	207
	1	130	143	238	286	343	442	110	117	192	201	304
FHB 320	**2**	259	281	391	409	454	468	200	230	319	325	392
	3	332	368	441	455	463	476	269	312	381	389	432
	4	368	390	446	462	481	488	311	334	388	394	437

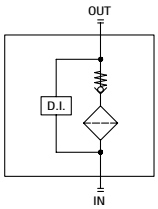
Maximum flow rate for a complete pressure filter with a pressure drop Δp = 1.5 bar.
The reference fluid has a kinematic viscosity of 30 mm^2/s (cSt) and a density of 0.86 kg/dm^3.

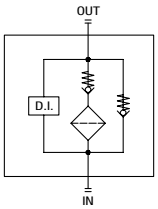
Hydraulic symbols

Filter series	Style S	Style B	Style T	Style D
FHB 050	•	•	•	•
FHB 065	•	•	•	•
FHB 135	•	•	•	•
FHB 320	•	•	•	•



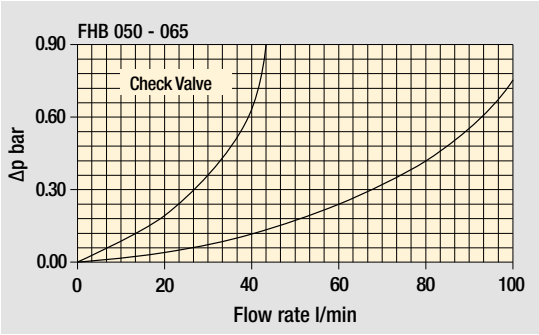


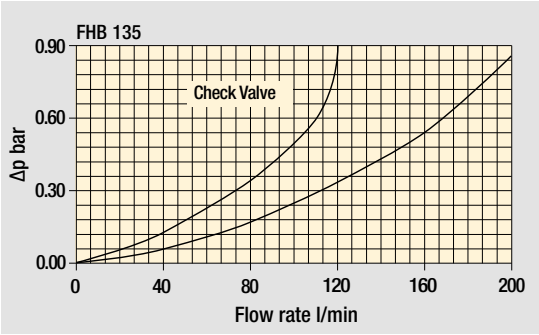


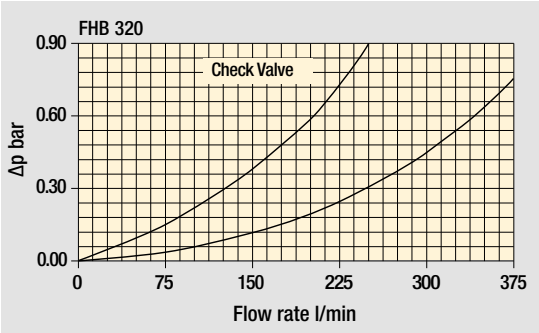


Pressure drop

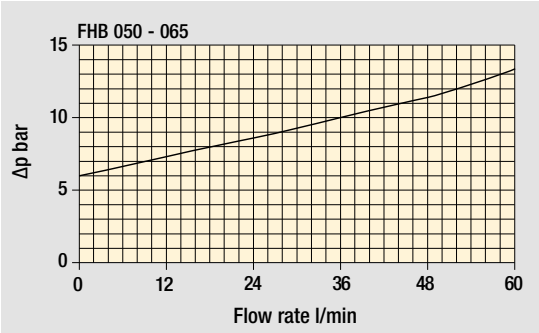
Filter housings Δp pressure drop

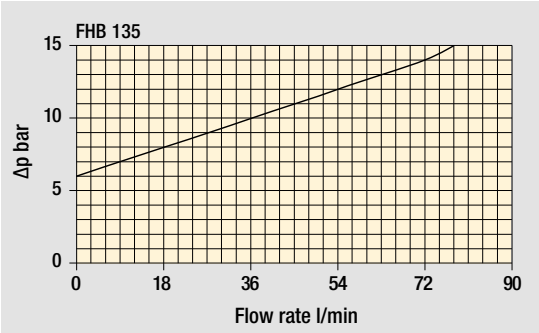


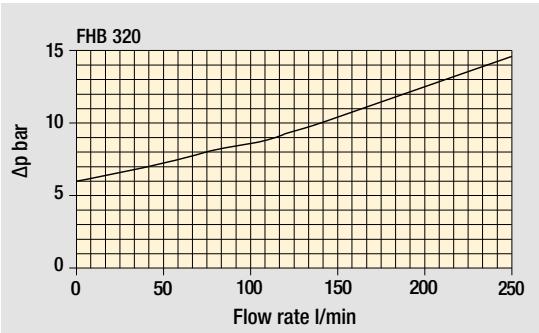




Bypass valve pressure drop







The curves are plotted using mineral oil with density of 0.86 kg/dm^3 in compliance with ISO 3968. Δp varies proportionally with density.

FHB FHB050 - FHB065 - FHB135 - FHB320

Designation & Ordering code

COMPLETE FILTER

Configuration example: FHB320 | 4 | S | A | F1 | A06 | H | P01

Series and size

FHB050 | **FHB065** | **FHB135** | **FHB320**

Length	FHB050	FHB065	FHB135	FHB320
1	•	•	•	•
2	•	•	•	•
3	•	•	•	•
4	•	-	-	•
5	•	-	-	-

Valves

S	Without bypass
B	With bypass 6 bar
T	With check valve, without bypass
D	With check valve, with bypass 6 bar

Seals

A	NBR
V	FPM

Connections

F1	Manifold

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Element Δp	Valves S	B	T	D
N 20 bar	-	•	-	•
S 210 bar (only for size 050)	•	-	•	-
H 210 bar (for sizes 065-135-320)	•	-	•	-

Execution	Filter size 050	065	135	320 1-2-3	320 4
P01 MP Filtri standard	•	•	•	•	•
P02 Maintenance from the bottom of the housing	-	-	-	-	•
Pxx Customized	•	•	•	•	•

FILTER ELEMENT

Configuration example: HP320 | 4 | A06 | A | H | P01

Element series and size

HP050 | **HP065** | **HP135** | **HP320**

Element length	FHB050	FHB065	FHB135	FHB320
1	•	•	•	•
2	•	•	•	•
3	•	•	•	•
4	•	-	-	•
5	•	-	-	-

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals	
A	NBR
V	FPM

Element Δp	Filter size 050	065	135	320
N 20 bar	•	•	•	•
S 210 bar (only for size 050)	•	-	-	-
H 210 bar (for sizes 065-135-320)	-	•	•	•

Execution	
P01	MP Filtri standard
Pxx	Customized

CLOGGING INDICATORS

See page 727

DEA	Electrical differential pressure indicator
DEM	Electrical differential pressure indicator
DEU	Electrical differential pressure indicator
DLA	Electrical / visual differential pressure indicator
DLE	Electrical / visual differential pressure indicator
DTA	Electronic differential pressure indicator
DVA	Visual differential pressure indicator
DVM	Visual differential pressure indicator

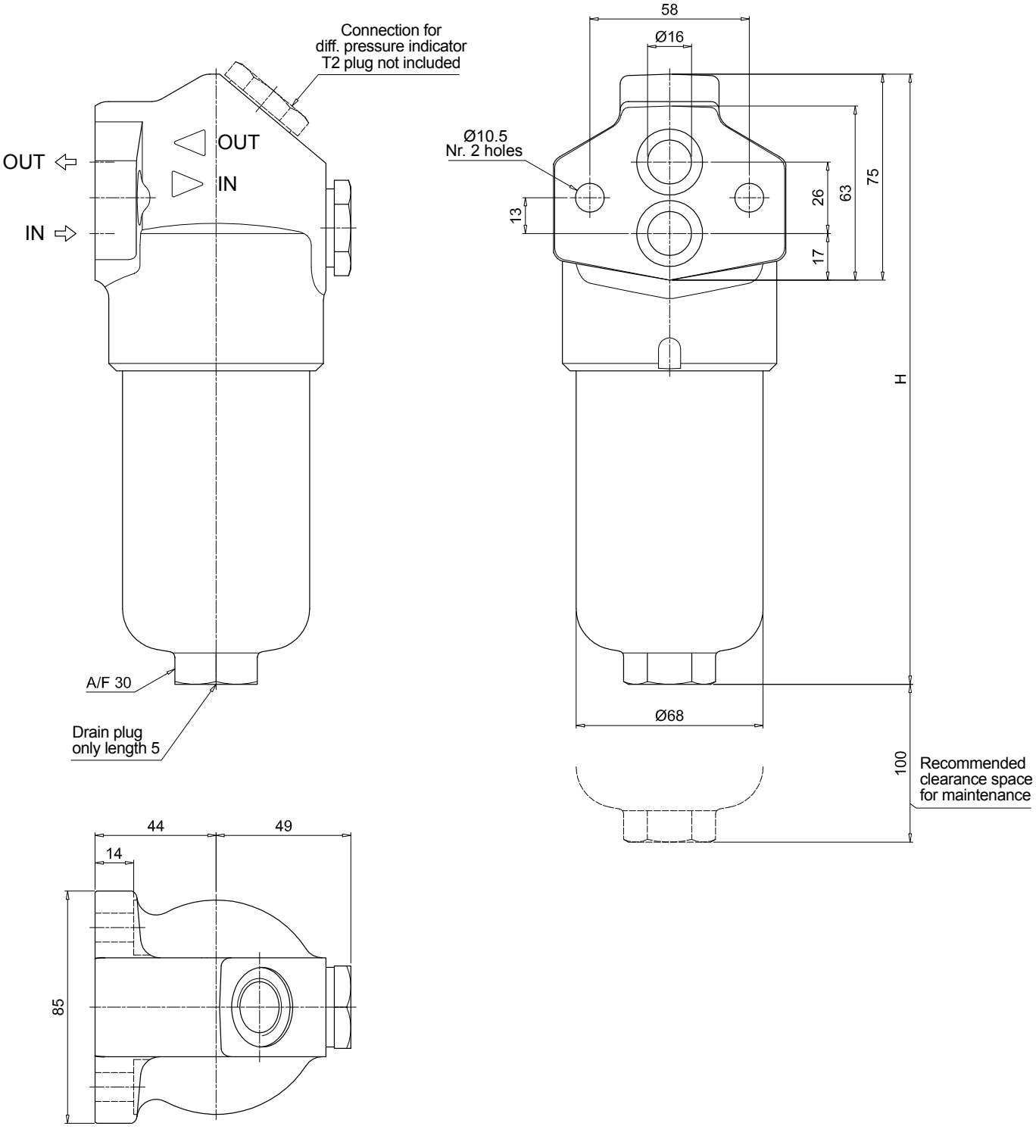
PLUGS

See page 747

T2	Plug (not included)

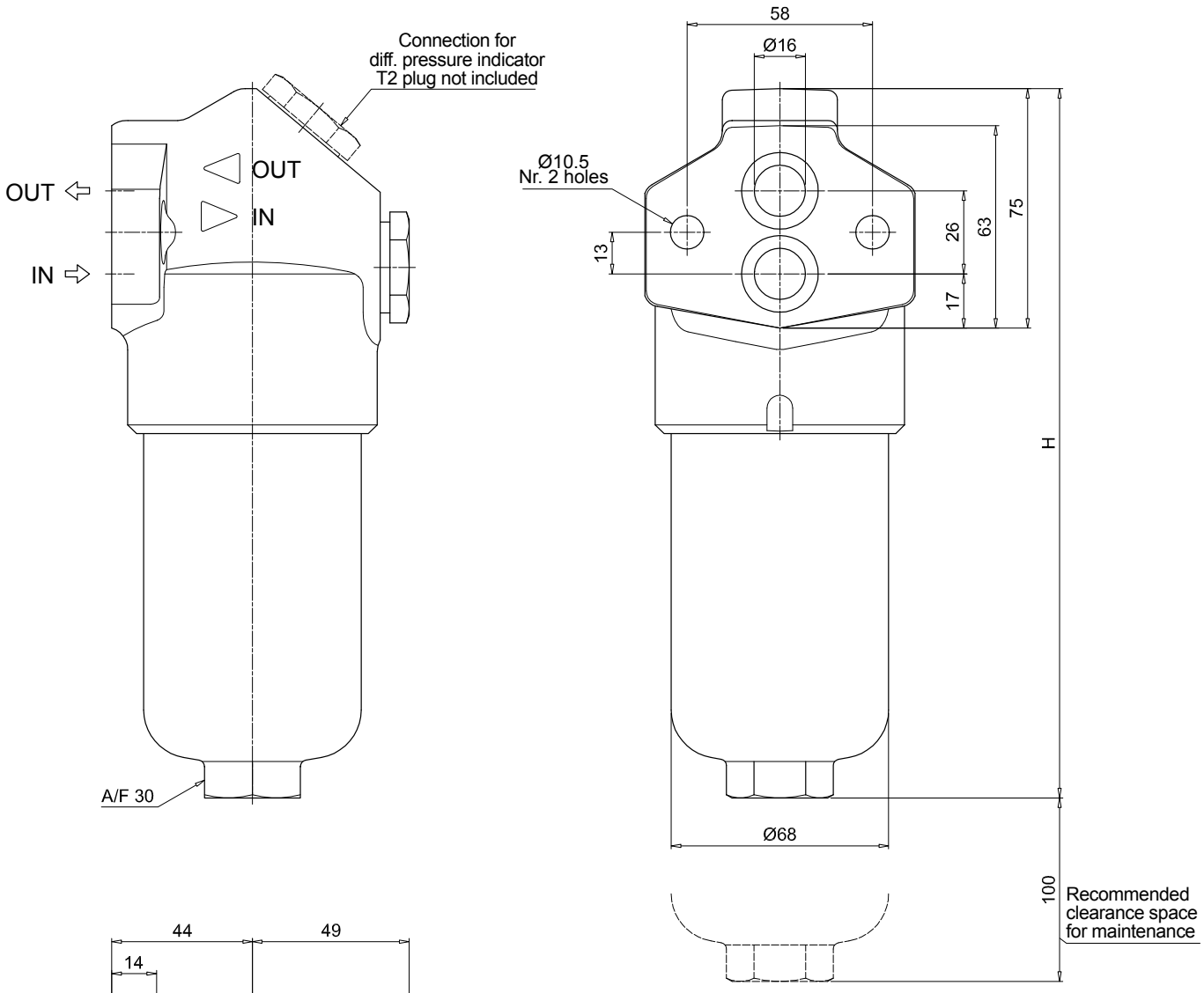
Dimensions

FHB050	
Filter length	**H [mm]**
1	187
2	224
3	266
4	314
5	436



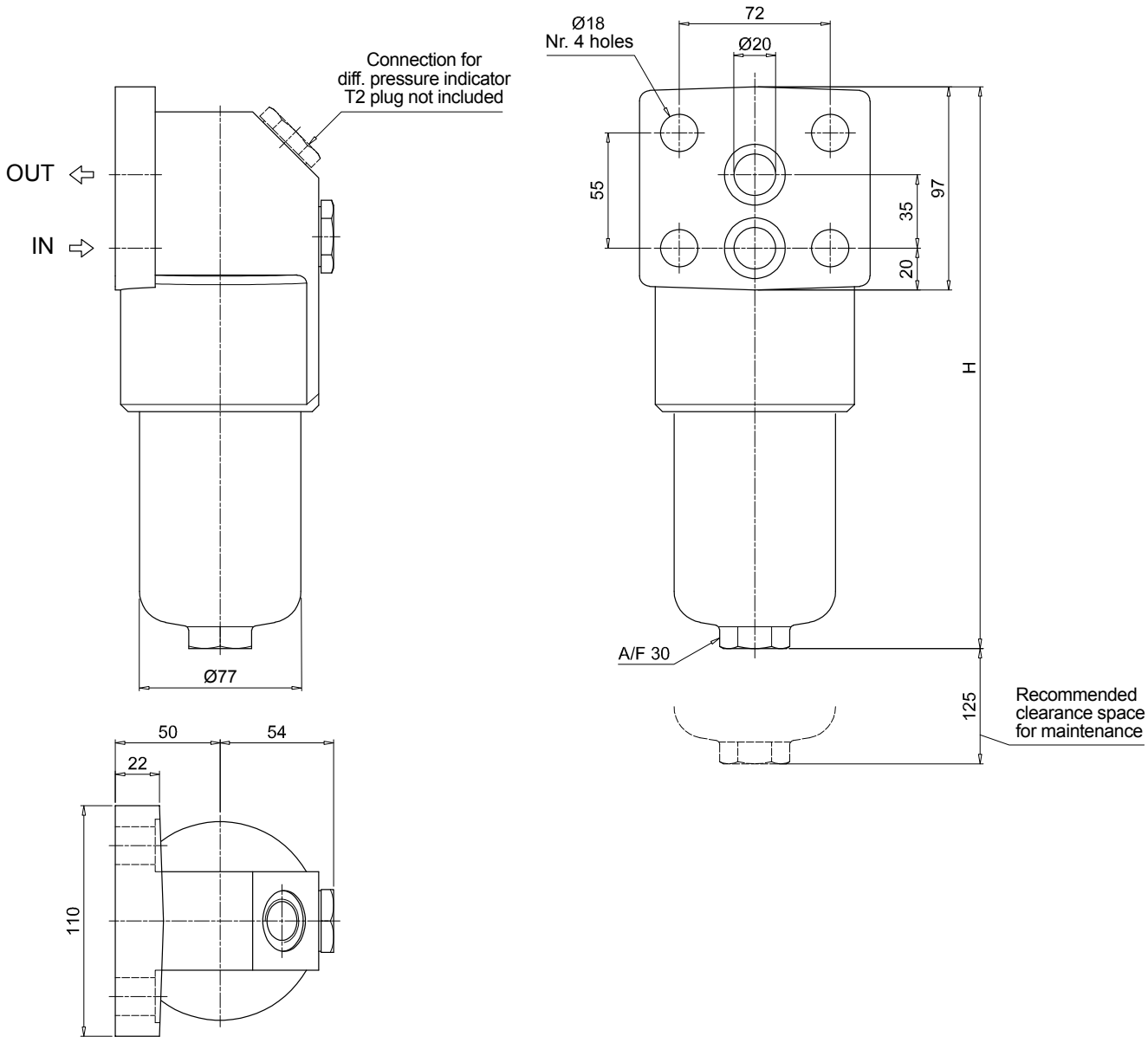
Dimensions

FHB065	
Filter length	**H [mm]**
1	196
2	227
3	329



Dimensions

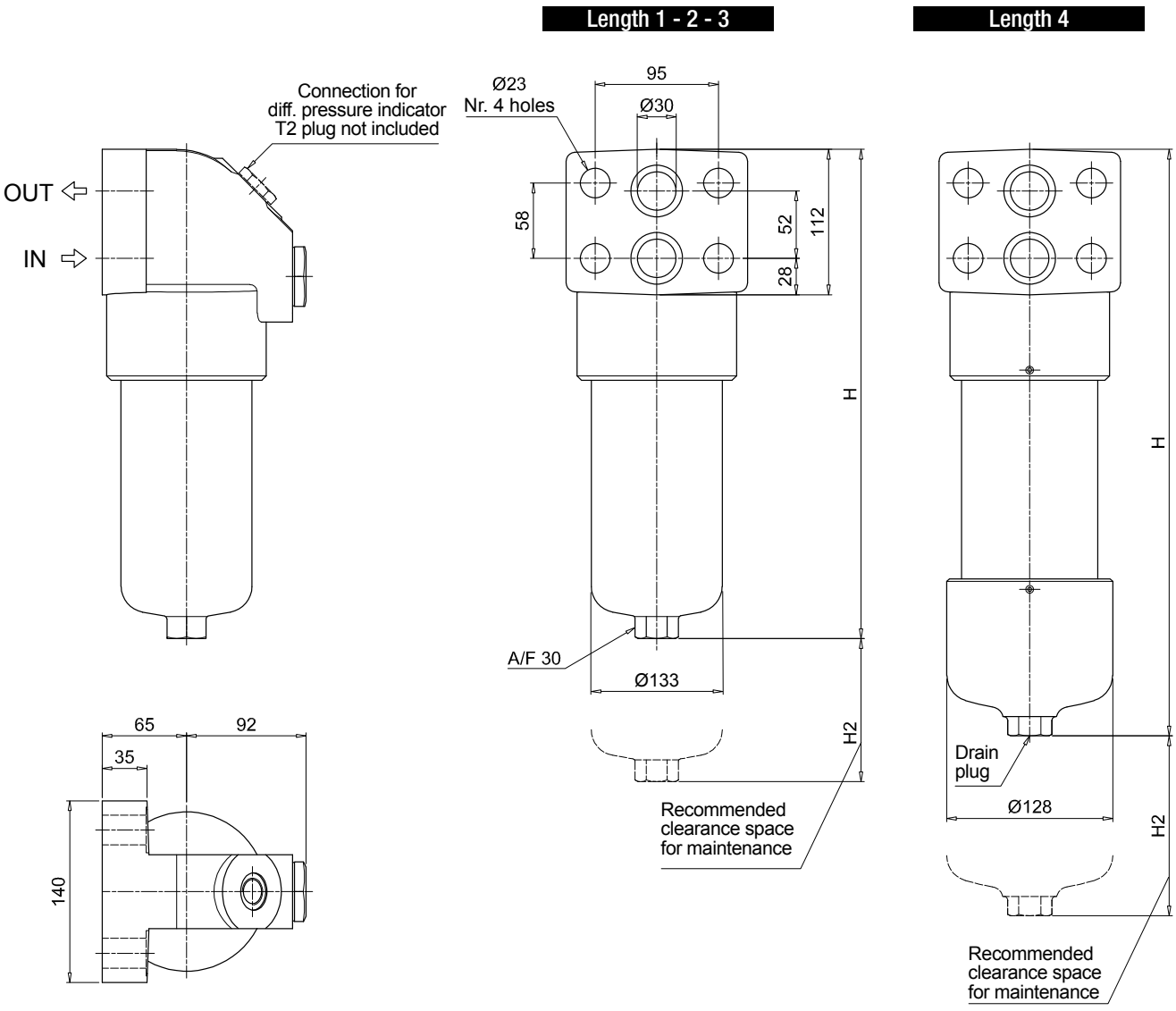
FHB135	
Filter length	**H [mm]**
1	268
2	381
3	456



Dimensions

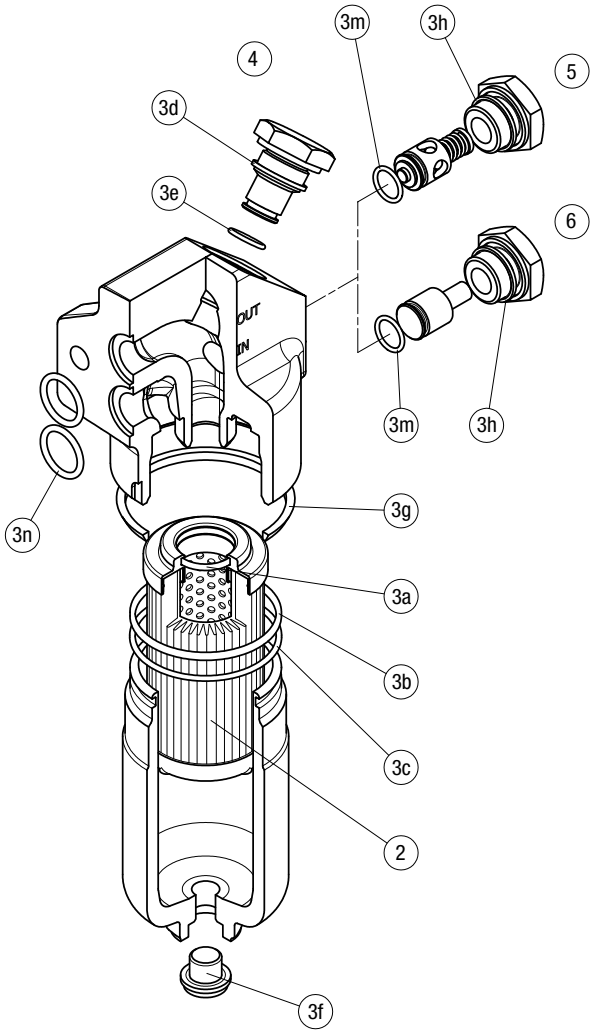
FHB320

Filter length	H [mm]	H2 [mm] Execution P01	P02
1	301	150	-
2	424	150	-
3	556	150	-
4	709	150	550



Order number for spare parts

FHB 050 - 065 - 135 - 320



Item:	Q.ty: 1 pc. (2)	Q.ty: 1 pc. (3) (3a ÷ 3n)		Q.ty: 1 pc. (4)		Q.ty: 1 pc. (5)		Q.ty: 1 pc. (6)	
Filter series	**Filter element**	**Seal Kit code number NBR**	**FPM**	**Indicator connection plug NBR**	**FPM**	**Bypass assembly NBR**	**FPM**	**Non-bypass assembly NBR**	**FPM**
FHB 050	See order table	02050412	02050413	T2H	T2V	02001312	02001385	02001314	02001386
FHB 065		02050266	02050277			02001312	02001385	02001314	02001386
FHB 135		02050270	02050281			02001312	02001385	02001314	02001386
FHB 320		02050273	02050284			02001381	02001382	02001383	02001384

DIFFERENTIAL PRESSURE INDICATORS

Configuration example 1:	DE	M	12	H	F	50	P01	
Configuration example 2:	DE	U	50	V	A	50	P01	UL
Configuration example 3:	DL	E	20	V	A	71	P01	
Configuration example 4:	DT	A	50	H	F	70	P01	
Configuration example 5:	DV	M	70	V			P01	

Series

DE Electrical differential pressure indicator
DL Electrical/Visual differential pressure indicator
DT Electronic differential pressure indicator
DV Visual differential pressure indicator

Type	DE	DL	DT	DV
A Standard type	•	•	•	**A** With automatic reset
M With wired electrical connection	•	-	-	**M** With manual reset
U Standard type 210 bar, UL certified	•	-	-	
E For high power supply	-	•	-	

Pressure setting	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
50 5.0 bar	•	•	•	•	•	•	•	•
70 7.0 bar	•	•	•	•	•	•	•	•
95 9.5 bar	•	•	-	•	•	•	•	•

Seals	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
H HNBR	•	•	-	•	•	•	•	•
V FPM	•	•	•	•	•	•	•	•

Thermostat	DEA	DEM	DEU	DLA	DLE	DT
A Without thermostat	•	•	•	•	•	-
F With thermostat	-	•	-	-	•	•

Electrical connections	DEA	DEM	DEU	DLA	DLE	DT
10 Connection AMP Superseal series 1.5	-	•	-	-	-	-
20 Connection AMP Timer Junior	-	•	-	-	-	-
30 Connection Deutsch DT-04-2-P	-	•	-	-	-	-
35 Connection Deutsch DT-04-3-P	-	•	-	-	-	-
50 Connection EN 175301-803	•	-	•	-	•	-
51 Connection EN 175301-803, transparent base with lamps 24 Vdc	-	-	-	•	-	-
52 Connection EN 175301-803, transparent base with lamps 110 Vdc	-	-	-	•	-	-
70 Connection IEC 61076-2-101 D (M12)	-	-	-	-	-	•
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc	-	-	-	•	-	-

Option

P01 MP Filtri standard
Pxx Customized

Certifications	DEU	OTHERS
Without	-	•
UL UL certification	•	-

PLUGS

Configuration example	T2	H

Series

T2 Plug

Seals

H HNBR
V FPM

FHF 325 GENERAL INFORMATION

Filter housing according to SAE J2066 for HF4 filter elements

Description

High Pressure filters

Manifold
Maximum working pressure up to 35 MPa (350 bar)
Flow rate up to 550 l/min

FHF is a range of high pressure filter for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly connected to the lines of the system through the hydraulic fittings or the proper flanged interface.

Available features:
- 1 1/2" female threaded connections, 1 1/2" flanged connections and manifold connections up to 1 1/2", for a maximum flow rate of 550 l/min
- Base-mounting design, for ease of the replacement of the filter element
- Filter element designed in accordance with SAE J2066 HF4 regulation
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Low collapse filter element "N", for use with filters provided with bypass valve
- Visual, electrical and electronic differential clogging indicators

Common applications:
Delivery lines, in any high pressure industrial equipment

Technical data

Filter housing materials
- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Cover: Cast iron (chemical heat treatment)
- Bypass valve: Brass - Steel

Pressure
- Working pressure: 35 MPa (350 bar)
- Test pressure: 52.5 MPa (525 bar)
- Burst pressure: 105 MPa (1050 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 35 MPa (350 bar)

Bypass valve
- Opening pressure 600 kPa (6 bar) ±10%
- Other opening pressures on request.

Δp element 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

Temperature
From -25 °C to +110 °C

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

Note
FHF filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm³]			
	Length	1	2	3	Length	1	2	3
FHF 325		23.90	32.68	41.47		3.50	5.80	8.11

Filter housing according to SAE J2066 for HF4 filter elements

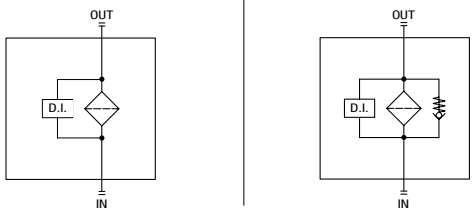
Flow rates [l/min]

		Filter element design - N Series					
Filter series	Length	A03	A06	A10	A16	A25	M25
FHF 325	1	302	339	348	419	500	556
	2	401	424	434	457	505	557
	3	416	451	460	469	510	559

Maximum flow rate for a complete pressure filter with a pressure drop Δp = 1.5 bar.
The reference fluid has a kinematic viscosity of 30 mm^2/s (cSt) and a density of 0.86 kg/dm^3.

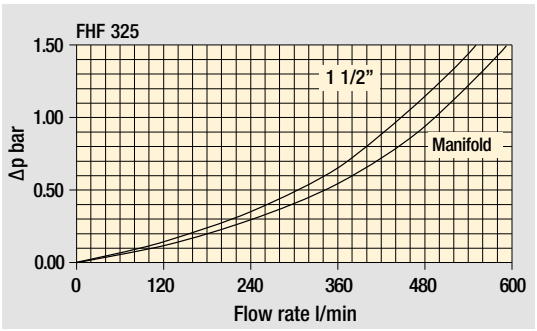
Hydraulic symbols

Filter series	Style S	Style B
FHF 325	•	•



Pressure drop

Filter housings Δp pressure drop



The curves are plotted using mineral oil with density of 0.86 kg/dm^3 in compliance with ISO 3968. Δp varies proportionally with density.

FHF 325

Designation & Ordering code

COMPLETE FILTER

Configuration example: FHF325 | 2 | S | A | H | 7 | A10 | N | P01

Series and size
FHF325

Length
1 | **2** | **3**

Valves
S Without bypass
B With bypass 6 bar

Seals
A NBR
V FPM

Connections
A G 1 1/2”
B 1 1/2” NPT
C SAE 24 - 1 7/8” - 12 UN
G 1 1/2” SAE 6000 psi/M
H 1 1/2” SAE 6000 psi/UNC
M Manifold ø1.38”
N Manifold ø1.50”

Connection for differential pressure indicator
7 With two connections plugged on both sides

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Element Δp
N 20 bar

Execution
P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Configuration example: HF325 | 2 | A10 | A | N | P01

Element series and size
HF325

Element length
1 | **2** | **3**

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals
A NBR
V FPM

Element Δp
N 20 bar

Execution
P01 MP Filtri standard
Pxx Customized

CLOGGING INDICATORS

See page 727

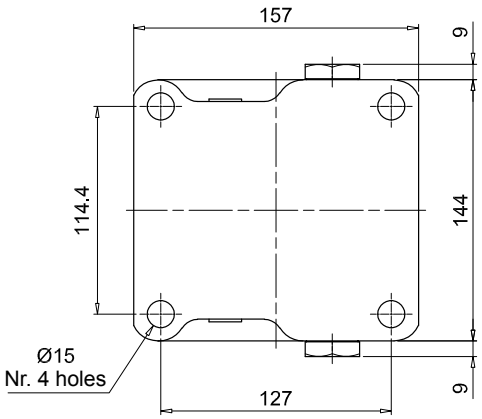
DEA Electrical differential pressure indicator
DEM Electrical differential pressure indicator
DEU Electrical differential pressure indicator
DLA Electrical / visual differential pressure indicator
DLE Electrical / visual differential pressure indicator
DTA Electronic differential pressure indicator
DVA Visual differential pressure indicator
DVM Visual differential pressure indicator

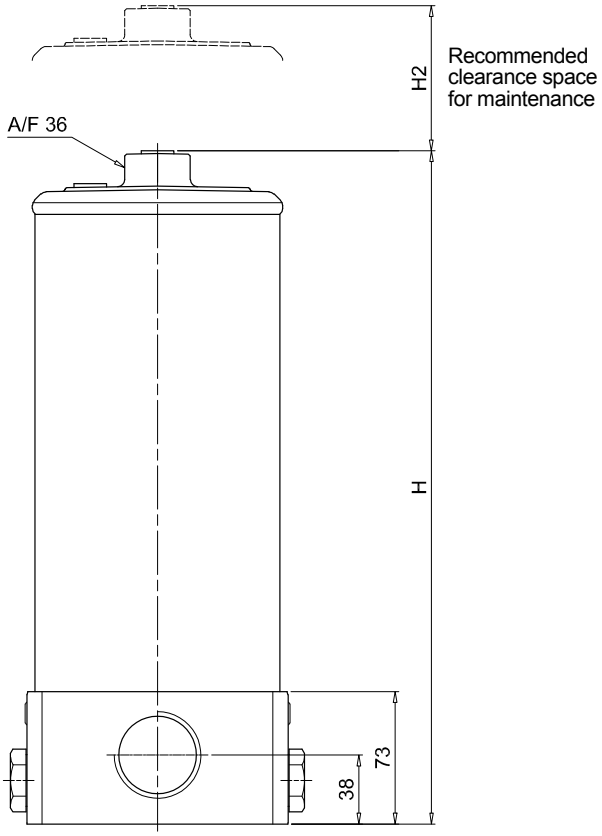
PLUGS

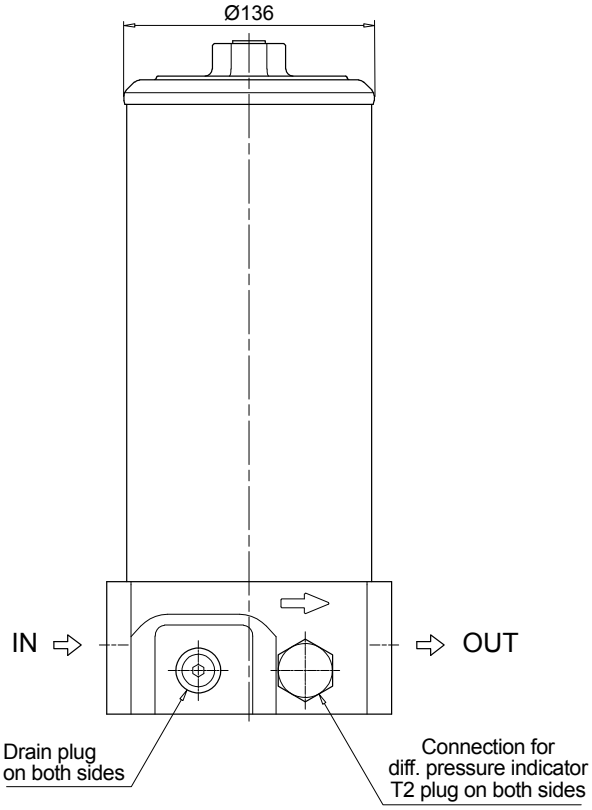
See page 747

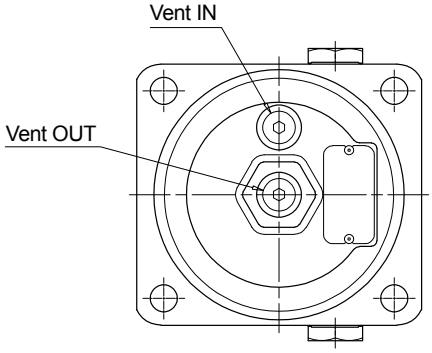
T2 Plug (not included)

FHF325		
Connection A - B - C		
Filter length	**H [mm]**	**H2 [mm]**
1	452	250
2	690	485
3	928	725





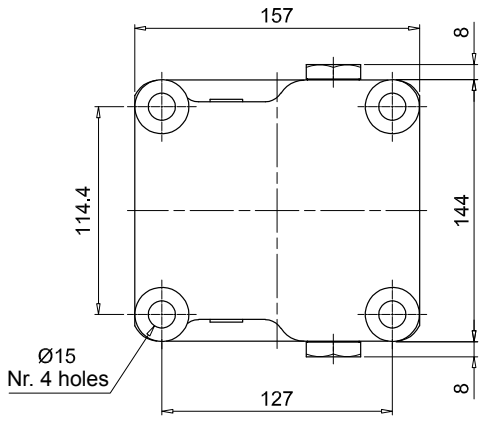


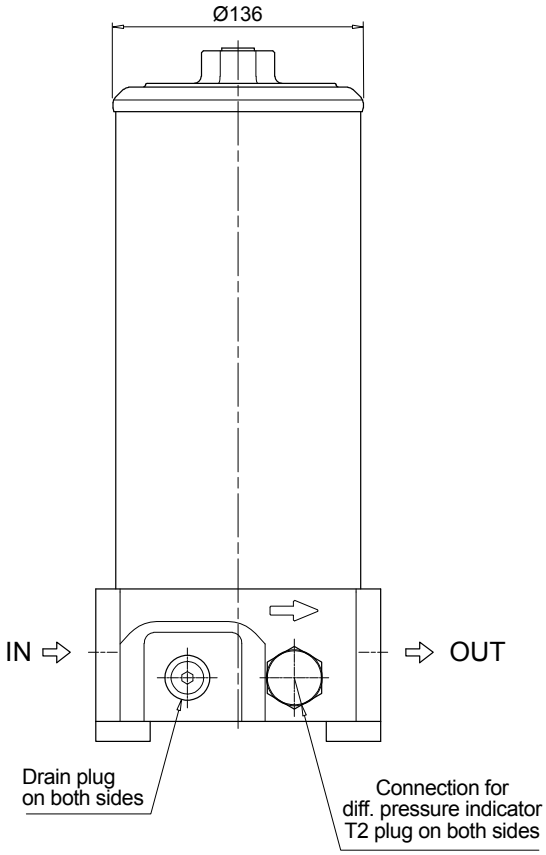


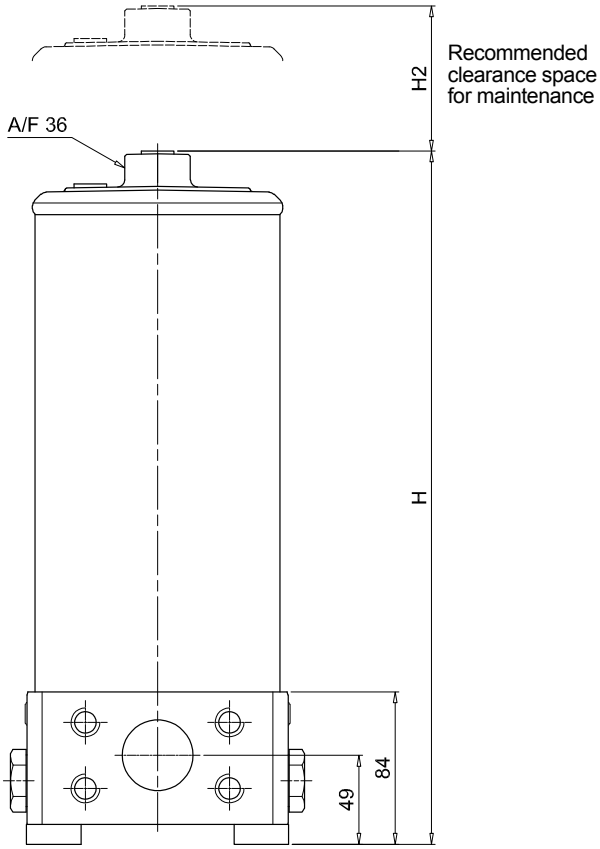
FHF 325

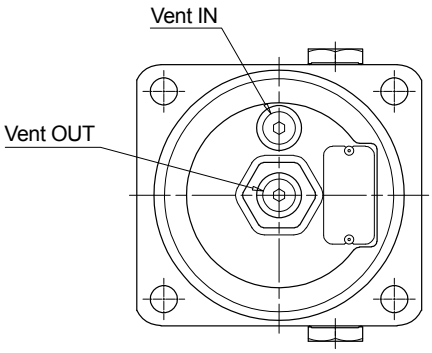
Dimensions

FHF325		
Connection G - H		
Filter length	H [mm]	H2 [mm]
1	463	250
2	701	485
3	939	725



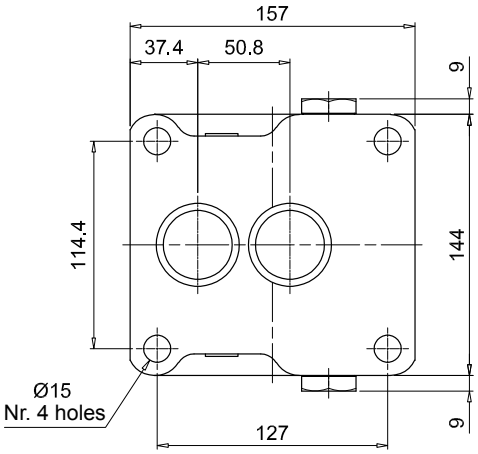


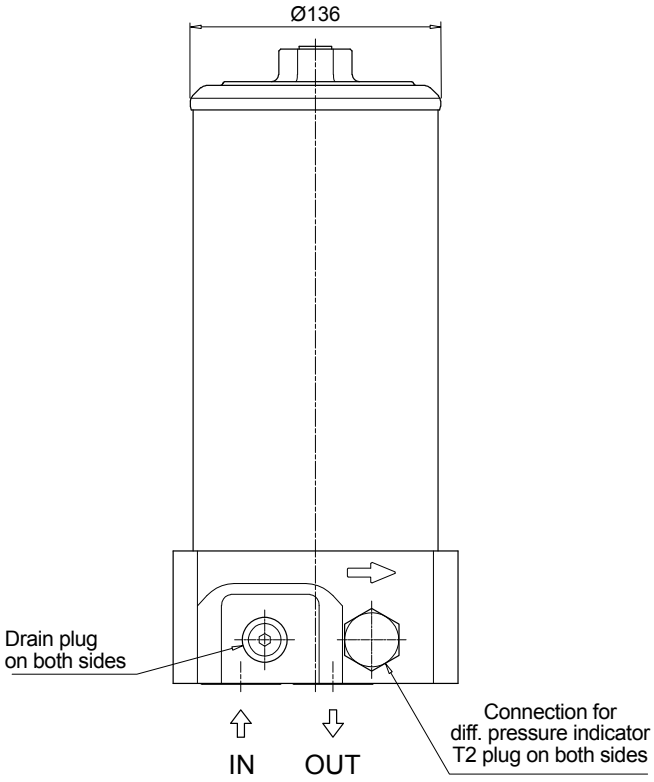


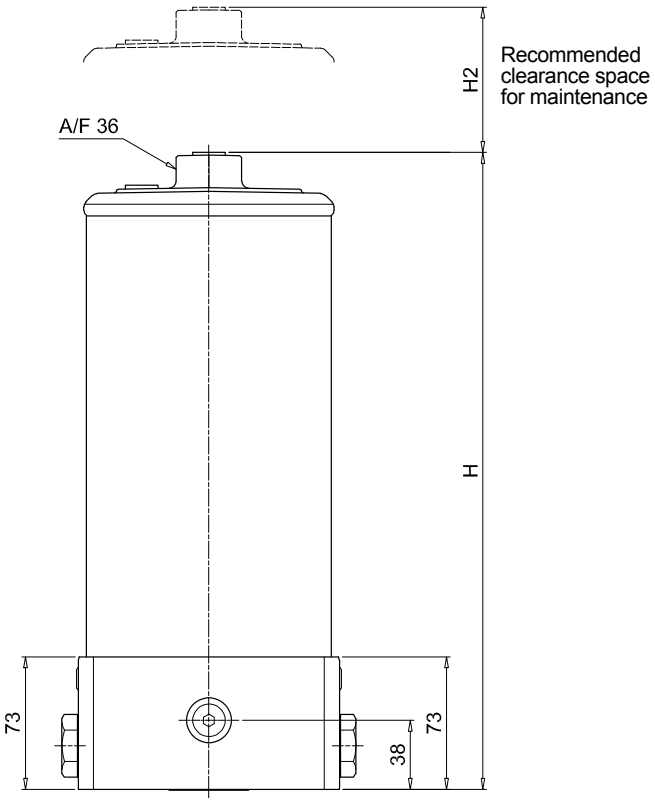


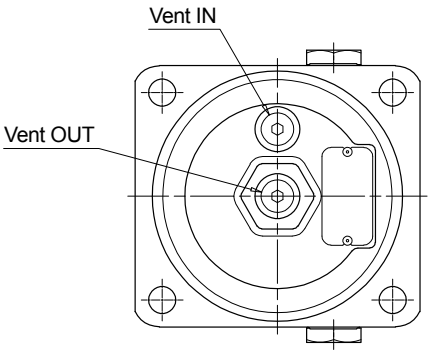
Dimensions

FHF325		
Connection M - N		
Filter length	**H [mm]**	**H2 [mm]**
1	452	250
2	690	485
3	928	725









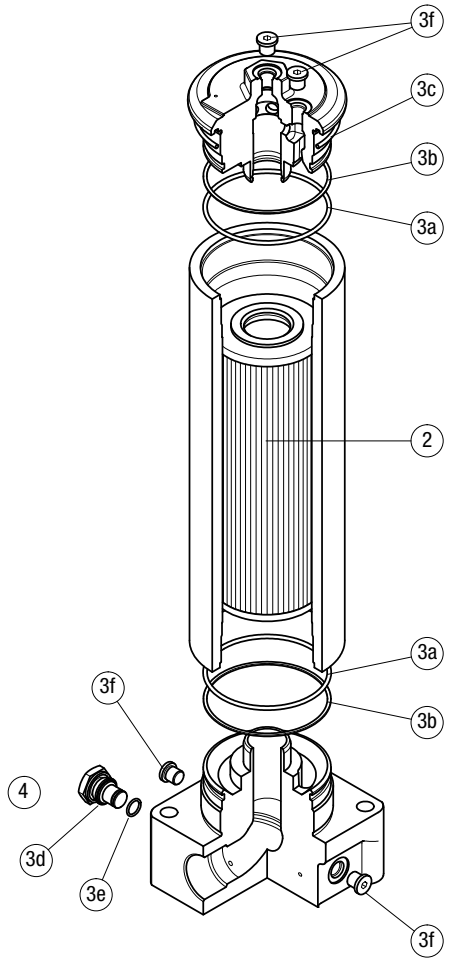
FHF 325 SPARE PARTS

Filter housing according to SAE J2066 for HF4 filter elements

Order number for spare parts

FHF 325

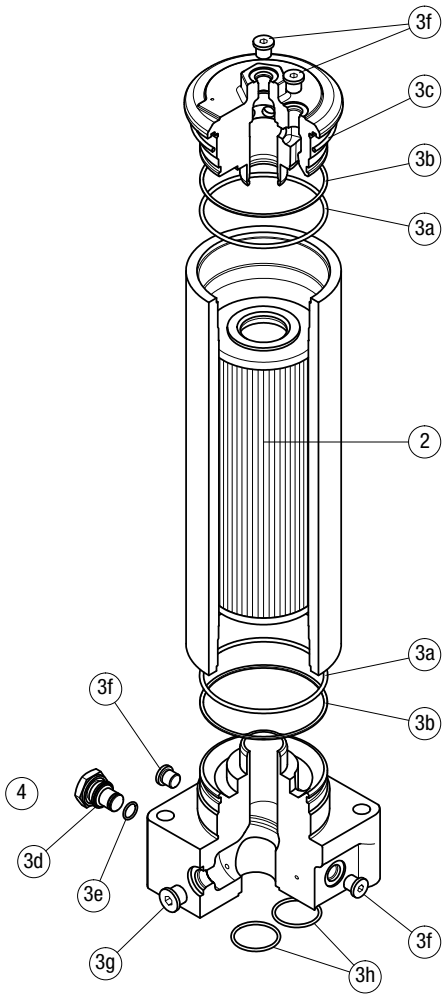
Connections
A - B - C - G - H



	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 2 pc.	
Item:	**2**	**3** (3a ÷ 3f)		**4**	
Filter series	**Filter element**	**Seal Kit code number NBR**	**FPM**	**Indicator connection plug NBR**	**FPM**
FHF 325 A-B-C-G-H	See order table	02050588	02050589	T2H	T2V

FHF 325

Connections
M - N



	Q.ty: 1 pc.	Q.ty: 1 pc.		Q.ty: 2 pc.	
Item:	**2**	**3** (3a ÷ 3h)		**4**	
Filter series	**Filter element**	**Seal Kit code number NBR**	**FPM**	**Indicator connection plug NBR**	**FPM**
FHF 325 M-N	See order table	02050590	02050591	T2H	T2V

DIFFERENTIAL PRESSURE INDICATORS

Configuration example 1:	DE	M	12	H	F	50	P01	
Configuration example 2:	DE	U	50	V	A	50	P01	UL
Configuration example 3:	DL	E	20	V	A	71	P01	
Configuration example 4:	DT	A	50	H	F	70	P01	
Configuration example 5:	DV	M	70	V			P01	

Series

DE Electrical differential pressure indicator
DL Electrical/Visual differential pressure indicator
DT Electronic differential pressure indicator
DV Visual differential pressure indicator

Type	DE	DL	DT	DV
A Standard type	•	•	•	**A** With automatic reset
M With wired electrical connection	•	-	-	**M** With manual reset
U Standard type 210 bar, UL certified	•	-	-	
E For high power supply	-	•	-	

Pressure setting	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
50 5.0 bar	•	•	•	•	•	•	•	•
70 7.0 bar	•	•	•	•	•	•	•	•
95 9.5 bar	•	•	-	•	•	•	•	•

Seals	DEA	DEM	DEU	DLA	DLE	DTA	DVA	DVM
H HNBR	•	•	-	•	•	•	•	•
V FPM	•	•	•	•	•	•	•	•

Thermostat	DEA	DEM	DEU	DLA	DLE	DT
A Without thermostat	•	•	•	•	•	-
F With thermostat	-	•	-	-	•	•

Electrical connections	DEA	DEM	DEU	DLA	DLE	DT
10 Connection AMP Superseal series 1.5	-	•	-	-	-	-
20 Connection AMP Timer Junior	-	•	-	-	-	-
30 Connection Deutsch DT-04-2-P	-	•	-	-	-	-
35 Connection Deutsch DT-04-3-P	-	•	-	-	-	-
50 Connection EN 175301-803	•	-	•	-	•	-
51 Connection EN 175301-803, transparent base with lamps 24 Vdc	-	-	-	•	-	-
52 Connection EN 175301-803, transparent base with lamps 110 Vdc	-	-	-	•	-	-
70 Connection IEC 61076-2-101 D (M12)	-	-	-	-	-	•
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc	-	-	-	•	-	-

Option

P01 MP Filtri standard
Pxx Customized

Certifications	DEU	OTHERS
Without	-	•
UL UL certification	•	-

PLUGS

Configuration example	T2	H

Series

T2 Plug

Seals

H HNBR
V FPM

HPB GENERAL INFORMATION

Description

High Pressure Bowl Kit

Maximum working pressure up to 42 MPa (420 bar)
Flow rate up to 300 l/min

HPB is a range of high pressure bowl kits for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly integrated in the control blocks.

Available features:
- Fine filtration rating, to get a good cleanliness level into the system
- Low collapse filter element “N”, for use with blocks provided with bypass valve
- High collapse filter element with external support “S”, for use with blocks not provided with the bypass valve

Technical data

Filter housing materials
- Housing: Phosphatized steel

Pressure
- Test pressure: 63 MPa (630 bar)
- Burst pressure: 126 MPa (1260 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 42 MPa (420 bar)

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

Seals
- Standard NBR series A
- Optional FPM series V

Temperature
From -25 °C to +110 °C

Note
HPB filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]						Volumes [dm³]					
	Length	1	2	3	4	5	Length	1	2	3	4	5
HPB 050		1.10	1.50	1.90	2.40	3.50		0.30	0.45	0.60	0.80	1.20
HPB 150		2.90	4.90	6.30	-	-		0.45	0.85	1.10	-	-

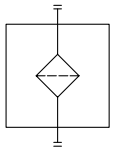
Flow rates [l/min]

		Filter element design - N Series						Filter element design - S Series				
Filter series	Length	A03	A06	A10	A16	A25	M25	A03	A06	A10	A16	A25
HPB 050	1	42	43	79	82	106	147	29	39	57	59	74
	2	52	57	85	96	121	149	45	49	76	88	114
	3	66	69	97	106	130	150	58	61	89	99	125
	4	83	89	113	115	134	152	74	80	106	108	129
	5	107	110	130	134	141	154	93	95	111	121	139
HPB 150	1	81	88	156	163	179	295					
	2	142	145	227	230	236	312					
	3	170	180	242	245	263	315					

Maximum flow rate for a complete pressure filter with a pressure drop Δp = 1.5 bar.
The reference fluid has a kinematic viscosity of 30 mm^2/s (cSt) and a density of 0.86 kg/dm^3.

Hydraulic symbols

Filter series	Style S
HPB 050	•
HPB 150	•



HPB GENERAL INFORMATION

Description

High Pressure Bowl Kit

Maximum working pressure up to 42 MPa (420 bar)
Flow rate up to 300 l/min

HPB is a range of high pressure bowl kits for protection of sensitive components in high pressure hydraulic systems in the mobile machines. They are directly integrated in the control blocks.

Available features:
- Fine filtration rating, to get a good cleanliness level into the system
- Low collapse filter element “N”, for use with blocks provided with bypass valve
- High collapse filter element with external support “S”, for use with blocks not provided with the bypass valve

Technical data

Filter housing materials
- Housing: Phosphatized steel

Pressure
- Test pressure: 63 MPa (630 bar)
- Burst pressure: 126 MPa (1260 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 42 MPa (420 bar)

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

Seals
- Standard NBR series A
- Optional FPM series V

Temperature
From -25 °C to +110 °C

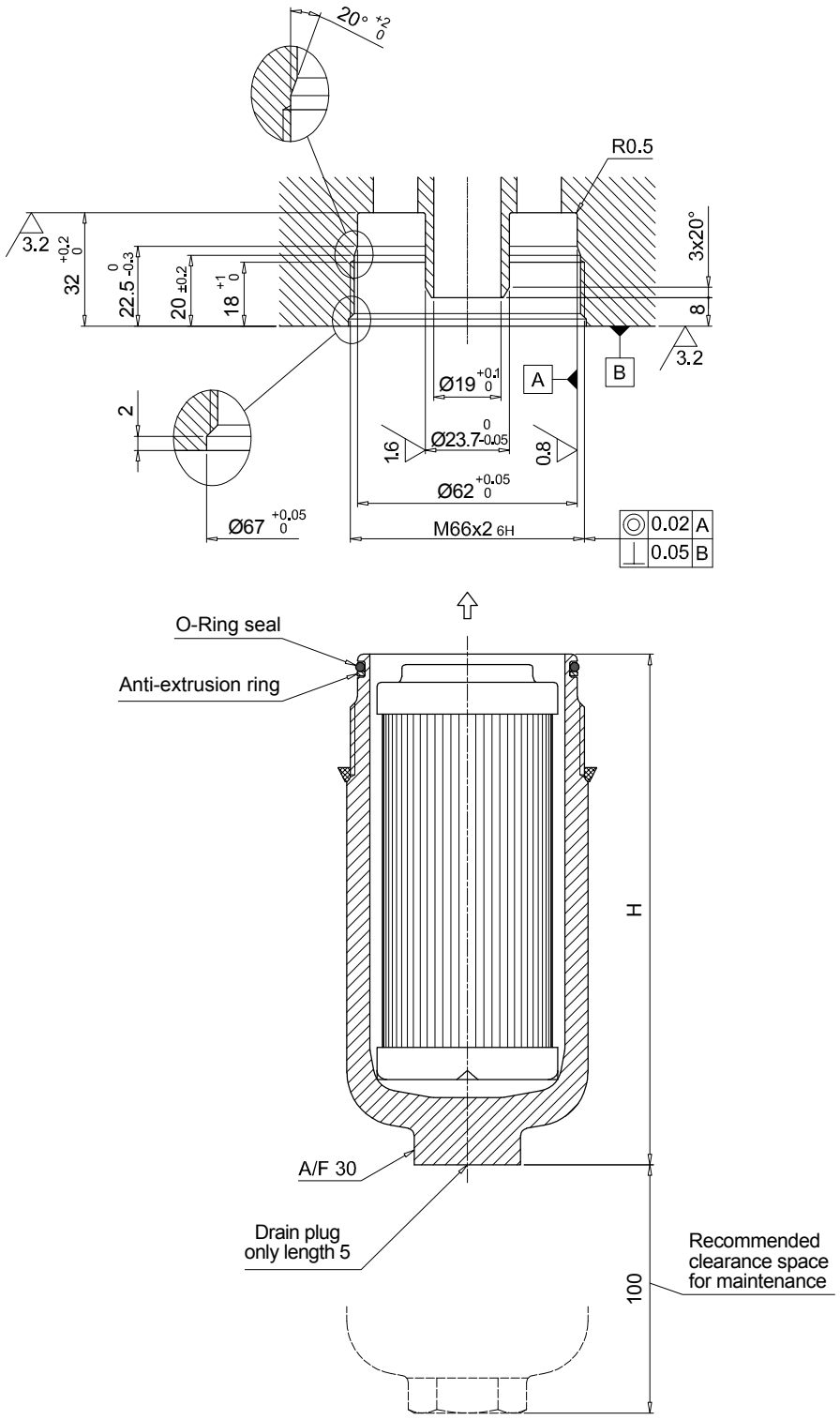
Note
HPB filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]						Volumes [dm³]					
	Length	1	2	3	4	5	Length	1	2	3	4	5
HPB 050		1.10	1.50	1.90	2.40	3.50		0.30	0.45	0.60	0.80	1.20
HPB 150		2.90	4.90	6.30	-	-		0.45	0.85	1.10	-	-

HPB050

Filter length	H [mm]
1	107
2	144
3	186
4	234
5	356



Designation & Ordering code

COMPLETE FILTER

Configuration example: HPB050 | 3 | A | A10 | N | P01

Series and size
HPB050

Length
1 | **2** | **3** | **4** | **5**

Seals

A	NBR
V	FPM

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Filtration rating

Element Δp		Axx	M25
N	20 bar	•	•
S	210 bar	•	-

Execution

P01	MP Filtri standard
Pxx	Customized

FILTER ELEMENT

Configuration example: HP050 | 3 | A10 | A | N | P01

Element series and size
HP050

Element length
1 | **2** | **3** | **4** | **5**

Filtration rating (filter media)

A03	Inorganic microfiber	3 µm
A06	Inorganic microfiber	6 µm
A10	Inorganic microfiber	10 µm
A16	Inorganic microfiber	16 µm
A25	Inorganic microfiber	25 µm
M25	Wire mesh	25 µm

Seals

A	NBR
V	FPM

Filtration rating

Element Δp		Axx	M25
N	20 bar	•	•
S	210 bar	•	-

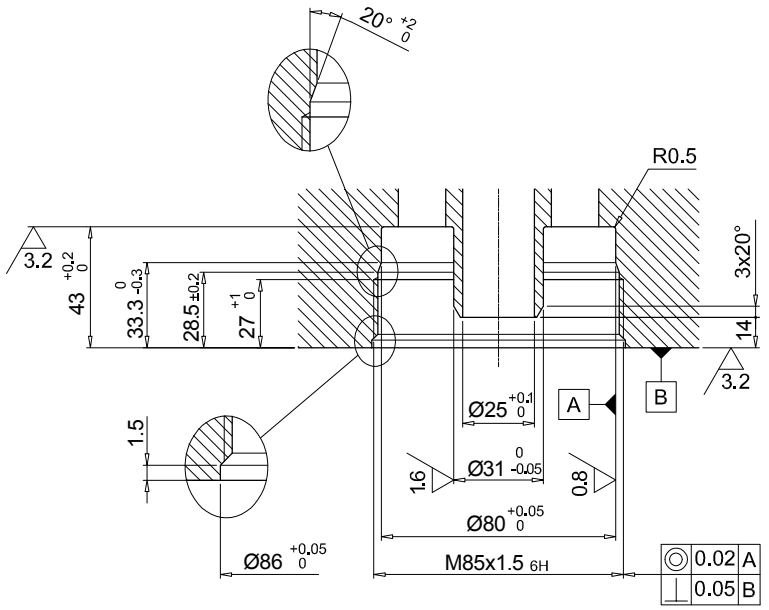
Execution

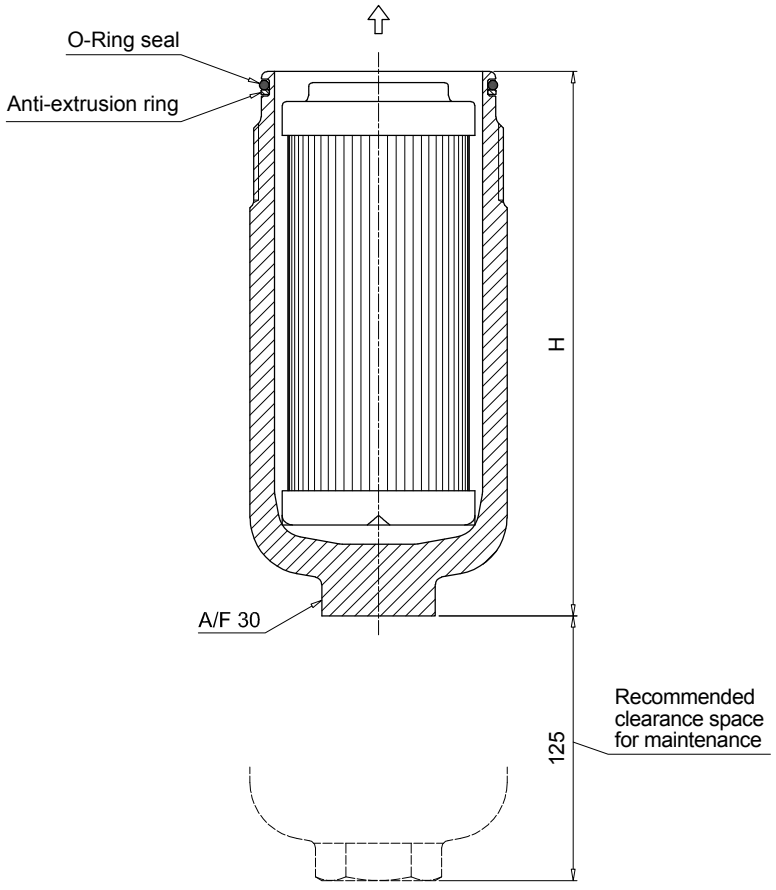
P01	MP Filtri standard
Pxx	Customized

Dimensions

HPB150

Filter length	H [mm]
1	161
2	271
3	346

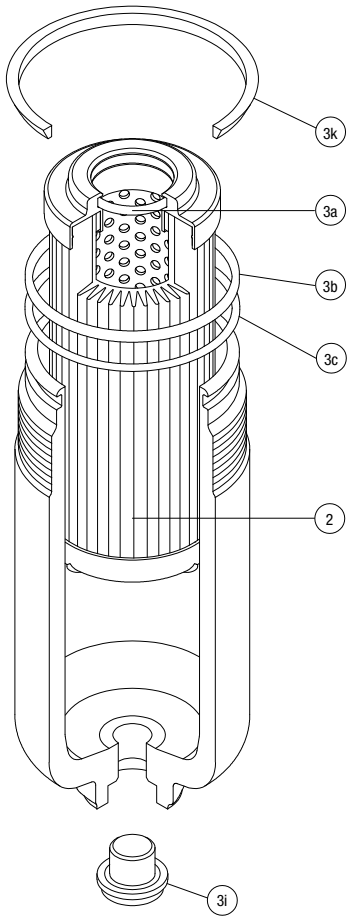




HPB SPARE PARTS

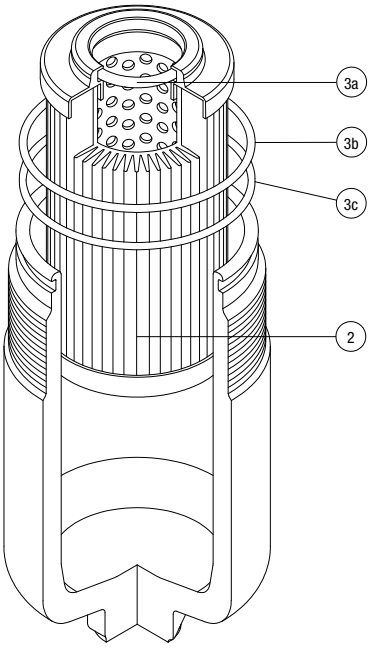
Order number for spare parts

HPB 050



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3i)	
Filter series	Filter element	Seal Kit code number NBR	FPM
HPB 050	See order table	02050813	02050823

HPB 150



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3c)	
Filter series	Filter element	Seal Kit code number NBR	FPM
HPB 150	See order table	02050816	02050826

По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
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Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
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Красноярск (391)204-63-61
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Ярославль (4852)69-52-93

Россия +7(495)268-04-70
Казахстан +(727)345-47-04
Беларусь +(375)257-127-884
Узбекистан +998(71)205-18-59
Киргизия +996(312)96-26-47

эл.почта: mqt@nt-rt.ru || сайт: https://mpfiltri.nt-rt.ru/