

Low & Medium Pressure filters

HFEX series

Maximum working pressure up to 508 psi - Flow rate up to 79 gpm



PASSION TO PERFORM





Light, reliable, and friendly to the environment - MP Filtri's ELIXIR low pressure concept filters have been specially designed for in-line connections, to handle working pressures up to 3.5 MPa (35 bar) / 508 psi.

This comprehensive range of filters includes four different series and four sizes for each series, to suit a variety of applications:

- SFEX SERIES - Suction
- RFEX SERIES - Return
- LFEX & HFEX SERIES - Delivery, which is equipped with differential indicator (electrical or visual)

The new generation of filters was designed to be interchangeable with our standard Spin-On range, to meet the requirement for the market and the environment.

Less material waste reduces the carbon footprint and protects the environment.



THE X CONCEPT FOR OUR FILTERS

Protect the performance of your system with MYclean.

Quality and efficiency are fundamental for MP Filtri:

this exclusive new filter element possesses polygon shape geometry and specific seal that ensures only original spare parts can be used - ensuring correct operation and higher system reliability.

HFEX series

with MY CLEAN FEX Filter Element



Protects the machine from improper use of non-original products.

Safety of constant quality protection & reliability

With exclusive filter element you are sure that only MP Filtri filter elements can be used, ensuring the best cleaning level of the oil due to the use of originals filter elements.

The products identified as HFEX are protected by:

- Italian Patent n° 102014902261205
- Canadian Patent n° 2,937,258
- European Patent n° 16181725.9
- US Patent n° 15/224,337

THE CORRECT FILTER SIZING HAS TO BE BASED ON THE TOTAL PRESSURE DROP DEPENDING BY THE APPLICATION.
THE MAXIMUM TOTAL PRESSURE DROP ALLOWED BY A NEW AND CLEAN HIGH PRESSURE PRESSURE FILTER HAVE TO BE IN THE RANGE 0.4 ÷ 0.6 bar 5.80 ÷ 8.70 psi.

The pressure drop calculation is performed by adding together the value of the housing with the value of the filter element. The pressure drop Δp_c of the housing is proportional to the fluid density (kg/dm^3 / lb/ft^3); all the graphs in the catalogue are referred to mineral oil with density of 0.86 kg/dm^3 / 53.68 lb/ft^3 . The filter element pressure drop Δp_e is proportional to its viscosity (mm^2/s / cSt), the corrective factor Y have to be used in case of an oil viscosity different than $30 \text{ mm}^2/\text{s}$ (cSt) / 150 SUS .

Sizing data for single filter element, head at top

Δp_c = Filter housing pressure drop [bar / psi]

Δp_e = Filter element pressure drop [bar / psi]

Y = Corrective factor Y (see correspondent table), depending on the filter type, on the filter element size, on the filter element length and on the filter media

Q = flow rate (l/min - gpm)

V1 reference oil viscosity = $30 \text{ mm}^2/\text{s}$ (cSt) / 150 SUS

V2 = operating oil viscosity in mm^2/s (cSt) / SUS

Filter element pressure drop calculation with an oil viscosity different than $30 \text{ mm}^2/\text{s}$ (cSt) / 150 SUS

International system:

$$\Delta p_e = Y : 1000 \times Q \times (V2:V1)$$

Imperial system:

$$\Delta p_e = Y : 17.2 \times Q \times (V2:V1)$$

$$\Delta p_{\text{Tot.}} = \Delta p_c + \Delta p_e$$

Verification formula

$$\Delta p_{\text{Tot.}} \leq \Delta p_{\text{max allowed}}$$

Maximum total pressure drop (Δp_{max}) allowed by a new and clean filter

Application	Range: [bar]	[psi]
Suction filters	0.08 - 0.10	1.16 - 1.45
Return filters	0.4 - 0.6	5.80 - 8.70
Return - Suction filters (*)	0.8 - 1.0	11.60 - 14.50
Low & Medium Pressure filters	0.4 - 0.6	5.80 - 8.70 return lines
	0.3 - 0.5	4.35 - 7.25 lubrication lines
	0.3 - 0.4	4.35 - 5.80 off-line in power systems
	0.1 - 0.3	1.45 - 4.35 off-line in test benches
High Pressure filters	0.4 - 0.6	5.80 - 8.7 over-boost
	0.8 - 1.5	11.60 - 21.75
Stainless Steel filters	0.8 - 1.5	11.60 - 21.75

(*) The suction flow rate should not exceed 30% of the return flow rate

Generic filter calculation example

Application data:

Return filter

Pressure Pmax = 10 bar / 145 psi

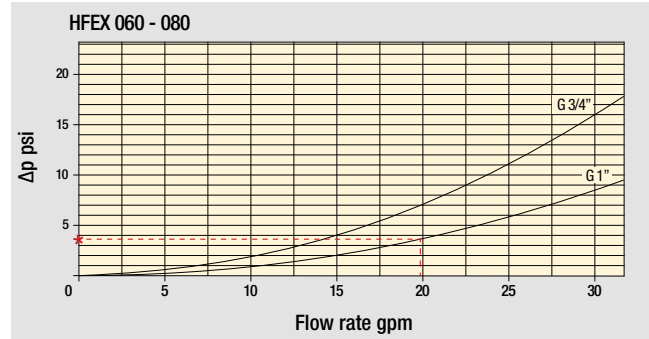
Flow rate Q = 75 l/min / 19.8 gpm

Viscosity V2 = $46 \text{ mm}^2/\text{s}$ (cSt) / 216 SUS

Oil density = 0.86 kg/dm^3 / 53.68 lb/ft^3

Required filtration efficiency = $25 \mu\text{m}$ with absolute filtration 1" inlet connection

Calculation: $\Delta p_c = 0.25 \text{ bar} / 3.63 \text{ psi}$ (see graphic below)



Filter housings Δp pressure drop.

The curves are plotted using mineral oil with density of 0.86 kg/dm^3 / 53.68 lb/ft^3 in compliance with ISO 3968. Δp varies proportionally with density.

$$\Delta p_e = (2.56 : 17.2) \times 19.8 \times (216 : 150) = 4.24 \text{ psi}$$

SFEX - RFEX - LFEX - HFEX corrective factor

Corrective factor Y to be used for the filter element pressure drop calculation.

The values depend to the filter size and length and to the filter media.

Reference oil viscosity $30 \text{ mm}^2/\text{s}$ / 150 SUS

Filter element	Absolute filtration N Series							Nominal filtration N Series			
	A03	A06	A10	A16	A25	P10	P25	M25	M60	M90	M250
FEX060	11.63	10.79	5.10	4.78	4.26	4.58	3.22	1.02	0.89	0.63	0.63
FEX080	6.83	6.69	3.35	3.19	2.56	1.97	1.38	0.62	0.45	0.29	0.29
FEX110	5.73	5.22	2.52	2.16	1.66	1.33	1.12	0.22	0.18	0.14	0.14
FEX160	3.72	3.59	1.79	1.76	1.22	0.90	0.76	0.15	0.10	0.09	0.09

Highlighted Y values related to HFEX return filters

$$\Delta p_{\text{Tot.}} = 3.63 + 4.24 = 7.87 \text{ psi}$$

The selection is correct because the total pressure drop value is inside the admissible range for low pressure filters.

In case the allowed max total pressure drop is not verified, it is necessary to repeat the calculation changing the filter length/size.

HFEX GENERAL INFORMATION

Description

Low & Medium Pressure filters

Maximum working pressure up to 508 psi
Flow rate up to 79 gpm

HFEX is a range of low pressure filter for protection of sensitive components in low pressure hydraulic systems. They are also suitable for the off-line filtration of small reservoirs.

They are directly connected to the lines of the system through the hydraulic fittings.

Available features:

- Female threaded connections up to 1 1/4", for a maximum flow rate of 79 gpm
- Fine filtration rating, to get a good cleanliness level into the system
- Water removal elements, to remove the free water from the hydraulic fluid
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual and electrical differential clogging indicators, capable to hold the overall dimension
- MYclean interface connection for the filter element, to protect the product against non-original spare parts
- External protective wrap, to optimize the flow through the element and to save the element efficiency against non-proper handling.

Common applications:

Delivery lines, in any low pressure industrial equipment or mobile machines.

Technical data

Filter housing materials

- Head: Aluminium
- Bypass valve: Polyamide - Steel
- Bowl: Aluminium

Bypass valve

Opening pressure 51 psi $\pm 10\%$

Δp element type

- Microfibre filter elements - series N: 116 psi
- Fluid flow through the filter element from OUT to IN

Seals

Standard NBR series A

Temperature

From -13 °F to +230 °F

Note

HFEX filters are provided for vertical mounting

Weights [lb] and volumes [in³]

Filter series	Weights [lb]	Volumes [in ³]
HFEX 060	3.30	37
HFEX 080	4.10	49
HFEX 110	5.70	98
HFEX 160	6.50	122

Hydraulic symbols

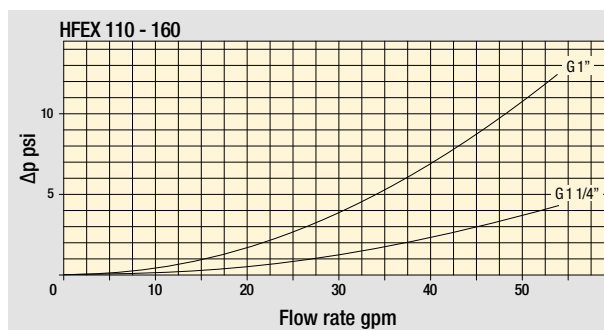
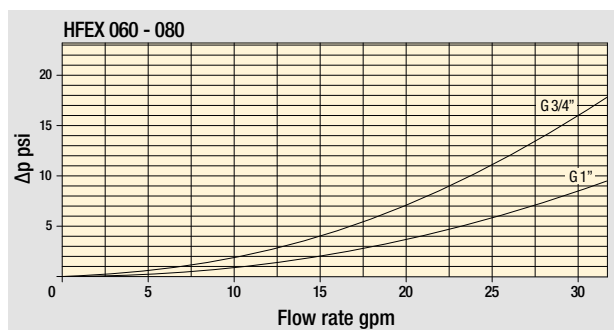
Filter series	Style S	Style B
HFEX 060	•	•
HFEX 080	•	•
HFEX 110	•	•
HFEX 160	•	•

OUT

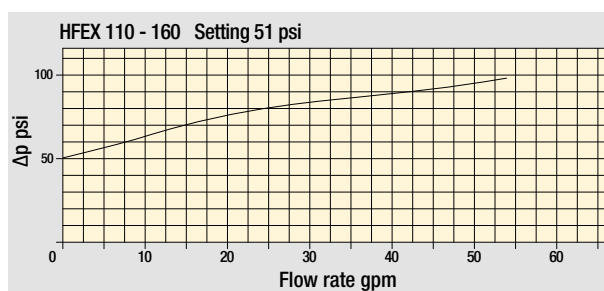
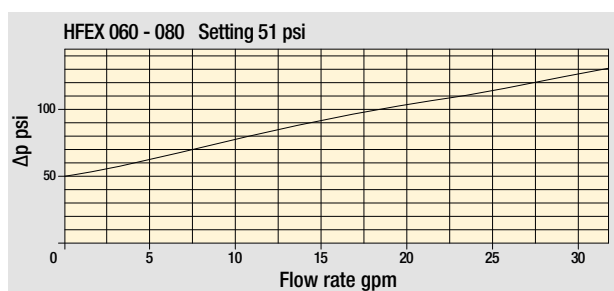
IN

OUT

IN



Filter housings
Δp pressure drop



Bypass valve
pressure drop

The curves are plotted using mineral oil with density of 0.86 kg/dm³ / 53.69 lb/ft³ in compliance with ISO 3968.
Δp varies proportionally with density.

Flow rates [gpm]

Filter element design - N Series										
Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
HFEX 060	12	12	17	17	18	22	22	23	18	19
HFEX 080	15	16	19	19	20	23	23	23	21	22

Connections of filter under test G 3/4"

Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
HFEX 060	13	13	20	20	21	27	28	28	20	25
HFEX 080	18	18	23	23	24	28	29	29	25	30

Connections of filter under test G 1"

Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
HFEX 110	28	30	48	52	57	78	79	79	61	64
HFEX 160	39	40	55	56	63	79	80	80	67	69

Connections of filter under test G 1 1/4"

Maximum flow rate for a complete delivery filter with a pressure drop Δp = 10.2 psi.


The reference fluid has a kinematic viscosity of 30 mm²/s (cSt) / 150 SUS and a density of 0.86 kg/dm³ / 53.69 lb/ft³.

For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

Please, contact our Sales Department for further additional information.

HFEX HFEX060 - HFEX080

Designation & Ordering code

COMPLETE FILTER			
Series and size		Configuration example : HFEX060	
HFEX060	Filter featuring  Filter Element	B	A
HFEX080		A	6
Bypass valve		A10	N
S Without bypass		P01	
B 51 psi			
Seals and treatments			
A NBR			
Connections			
A G 3/4"			
B G 1"			
C 3/4" NPT			
D 1" NPT			
E SAE 12 - 1 1/16" - 12 UN			
F SAE 16 - 1 5/16" - 12 UN			
Connection			
1 Without			
6 With plugged connections			
Filtration rating			
A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm		
A06 Inorganic microfiber 6 µm	M60 Wire mesh 60 µm		
A10 Inorganic microfiber 10 µm	M90 Wire mesh 90 µm		
A16 Inorganic microfiber 16 µm	P10 Resin impregnated paper 10 µm		
A25 Inorganic microfiber 25 µm	P25 Resin impregnated paper 25 µm		
WA025 Water absorber inorganic microfiber 25 µm			

Element Δp


N 116 psi

Execution

P01 MP Filtri standard

Pxx Customized

All filter media except M60, P10 and P25 are compatible with fluids HFA, HFB and HFC.

FILTER ELEMENT			
Element series and size		Configuration example : FEX060	
FEX060	Filter Element with  feature	A10	A
FEX080		N	P01
Filtration rating			
A03 Inorganic microfiber 3 µm	M25 Wire mesh 25 µm		
A06 Inorganic microfiber 6 µm	M60 Wire mesh 60 µm		
A10 Inorganic microfiber 10 µm	M90 Wire mesh 90 µm		
A16 Inorganic microfiber 16 µm	P10 Resin impregnated paper 10 µm		
A25 Inorganic microfiber 25 µm	P25 Resin impregnated paper 25 µm		
WA025 Water absorber inorganic microfiber 25 µm			
Seals and treatments			
A NBR			

Element Δp

N 116 psi

Execution

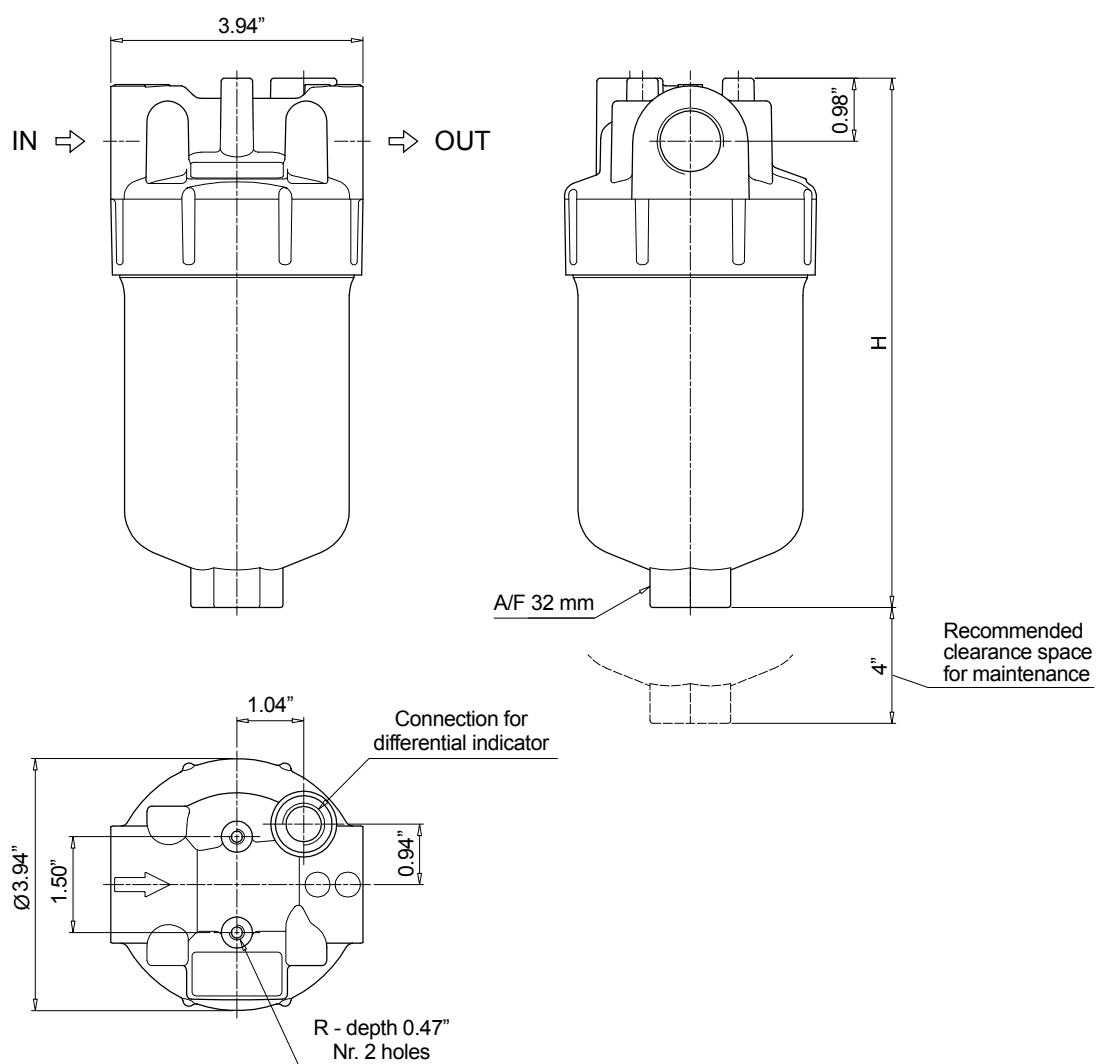
P01 MP Filtri standard

Pxx Customized

All filter media except M60, P10 and P25 are compatible with fluids HFA, HFB and HFC.


Filter size	H [in]
060	8.27"
080	10.75"


Connections	R
A	M6
B	M6
C	1/4" UNC
D	1/4" UNC
E	1/4" UNC
F	1/4" UNC



HFEX HFEX110 - HFEX160

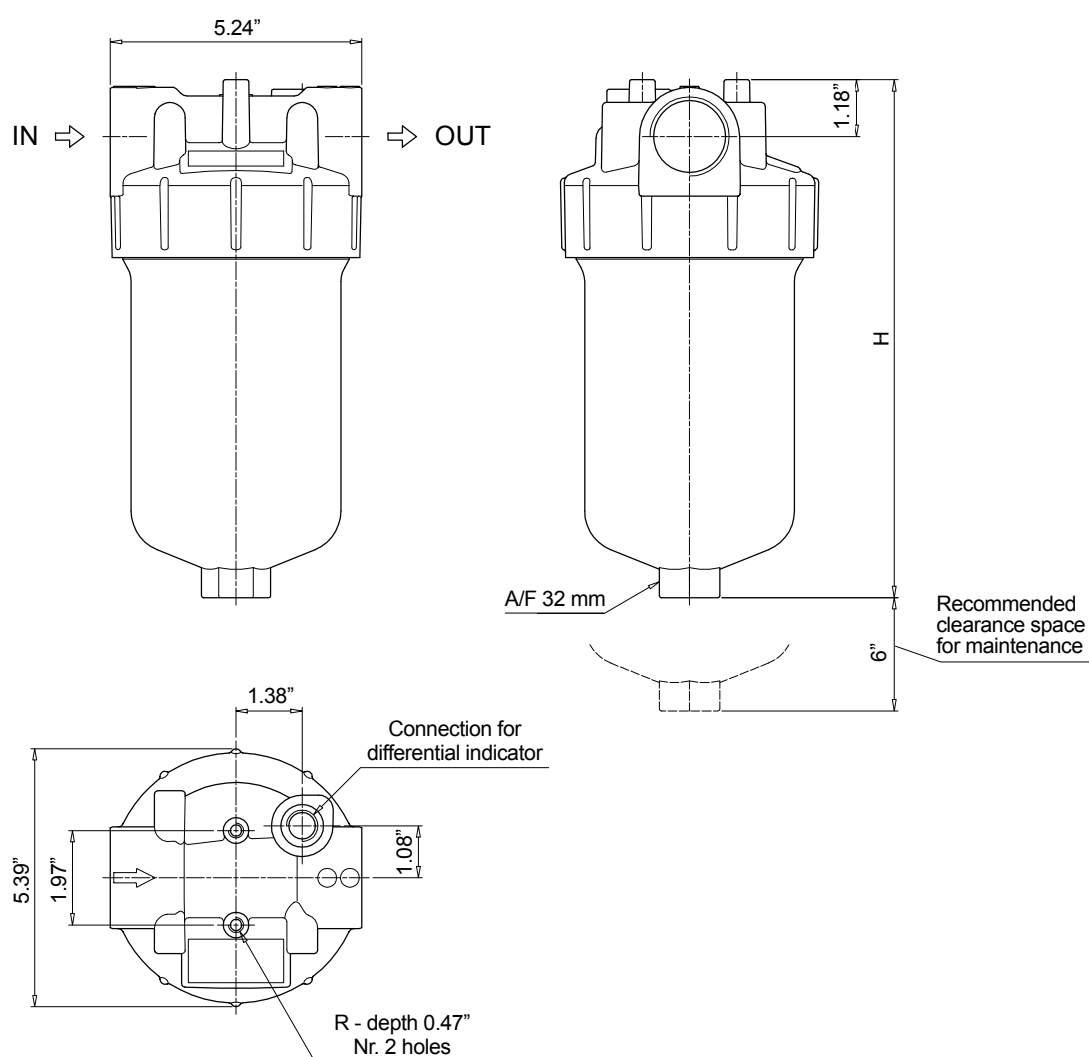
Designation & Ordering code

COMPLETE FILTER								
Series and size		Configuration example: HFEX110						
HFEX110 Filter featuring  Filter Element		B	A	A	6	A10	N	P01
HFEX160								
Bypass valve								
S Without bypass								
B 51 psi								
Seals and treatments								
A NBR								
Connections								
A G 1"								
B G 1 1/4"								
C 1" NPT								
D 1 1/4" NPT								
E SAE 16 - 1 5/16" - 12 UN								
F SAE 20 - 1 5/8" - 12 UN								
Connection								
1 Without								
6 With plugged connections								
Filtration rating								
A03 Inorganic microfiber	3 µm	M25 Wire mesh	25 µm					
A06 Inorganic microfiber	6 µm	M60 Wire mesh	60 µm					
A10 Inorganic microfiber	10 µm	M90 Wire mesh	90 µm					
A16 Inorganic microfiber	16 µm	P10 Resin impregnated paper	10 µm					
A25 Inorganic microfiber	25 µm	P25 Resin impregnated paper	25 µm					
WA025 Water absorber inorganic microfiber 25 µm								
All filter media except M60, P10 and P25 are compatible with fluids HFA, HFB and HFC.								
Element Δp		N 116 psi						
Execution		P01 MP Filtri standard Pxx Customized						

FILTER ELEMENT								
Element series and size		Configuration example: FEX110						
FEX110 Filter Element with  feature		A10	A	N	P01			
FEX160								
Filtration rating								
A03 Inorganic microfiber	3 µm	M25 Wire mesh	25 µm					
A06 Inorganic microfiber	6 µm	M60 Wire mesh	60 µm					
A10 Inorganic microfiber	10 µm	M90 Wire mesh	90 µm					
A16 Inorganic microfiber	16 µm	P10 Resin impregnated paper	10 µm					
A25 Inorganic microfiber	25 µm	P25 Resin impregnated paper	25 µm					
WA025 Water absorber inorganic microfiber 25 µm								
All filter media except M60, P10 and P25 are compatible with fluids HFA, HFB and HFC.								
Seals and treatments								
A NBR								
Element Δp		N 116 psi						
Execution		P01 MP Filtri standard Pxx Customized						

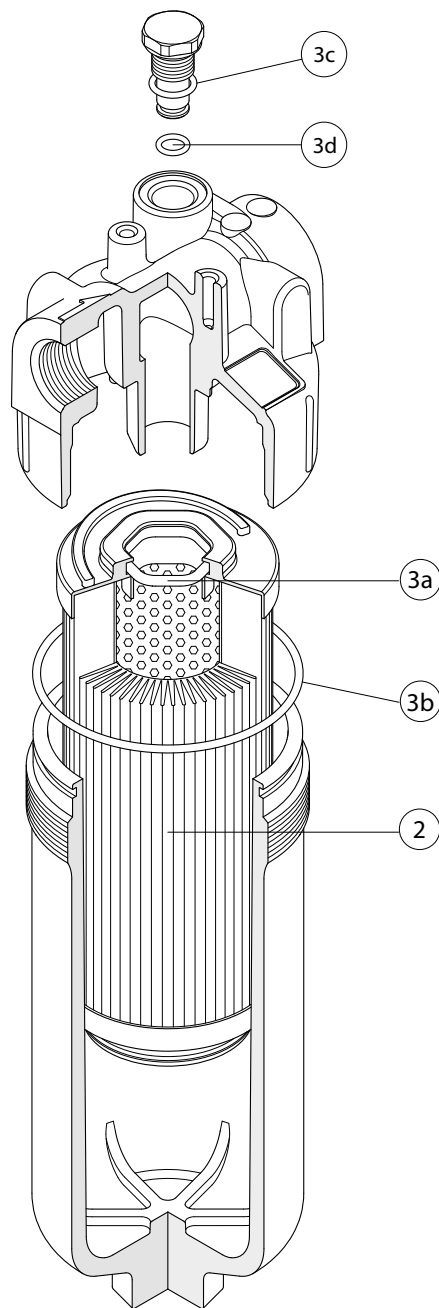
Filter size	H [in]
110	10.79"
160	12.72"

Connections	R
A	M8
B	M8
C	5/16" UNC
D	5/16" UNC
E	5/16" UNC
F	5/16" UNC



HFEX SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.
Filter series	Filter element	Seal Kit code number NBR	Indicator connection plug NBR
HFEX 060-080	See order table	02050771	T3H
HFEX 110-160		02050772	

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