

Low & Medium Pressure filters

LFEX series

Maximum working pressure up to 1.6 MPa (16 bar) - Flow rate up to 300 l/min



ELIXIR®

Lighter, easier to use, and kinder to the environment - MP Filtri's new ELIXIR low pressure concept filters have been specially designed for in-line connections and to handle working pressures up to 1.6 MPa (16 bar).

The concept is now available in three new series:

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

Available in 4 sizes: 060, 080, 110, and 160, the new generation of filters is completely interchangeable with the previous MPS 050/070/100/150 series of the Spin-on range.

The new cast aluminium head and nylon design reduces weight by 10 per cent compared to the Spin-on range.

Less waste reduces both your carbon footprint and protects the environment.

Replacement is fast and easy, just disassemble the bowl with a 32mm fixed wrench, take out the FEX filter element and replace.



Improved connection system
(between the head and the filter element and between the head and the bowl) reduces leakage so the dirt to the output circuit is reduced.



LFEX Series
New smaller differential indicator - electrical or visual.



High flow rate thanks to the head geometry: the oil enters in the filter element in a spiral flow and spreads more effectively inside the filter element for greater longevity.

FILTER SIZING Calculation & Corrective factor

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

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); all the graphs in the catalogue are referred to mineral oil with density of $0.86 \text{ kg}/\text{dm}^3$. The filter element pressure drop Δp_e is proportional to its viscosity (mm^2/s); the corrective factor Y have to be used in case of an oil viscosity different than $30 \text{ mm}^2/\text{s}$ (cSt).

Sizing data for single filter element

Δp_c = Filter housing pressure drop [bar]

Δp_e = Filter element pressure drop [bar]

Y = Corrective factor Y (see corresponding 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)

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

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

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

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

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

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)
Suction filters	0.08 ÷ 0.10
Return filters	0.4 ÷ 0.6
	0.4 ÷ 0.6 return lines
	0.3 ÷ 0.5 lubrication lines
Low & Medium Pressure filters	0.3 ÷ 0.4 off-line in power systems
	0.1 ÷ 0.3 off-line in test benches
	0.4 ÷ 0.6 over-boost
High Pressure filters	0.8 ÷ 1.5
Stainless Steel filters	0.8 ÷ 1.5

Generic filter calculation example

Application data:

Return filter

Pressure $P_{\text{max}} = 10 \text{ bar}$

Flow rate $Q = 75 \text{ l/min}$

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

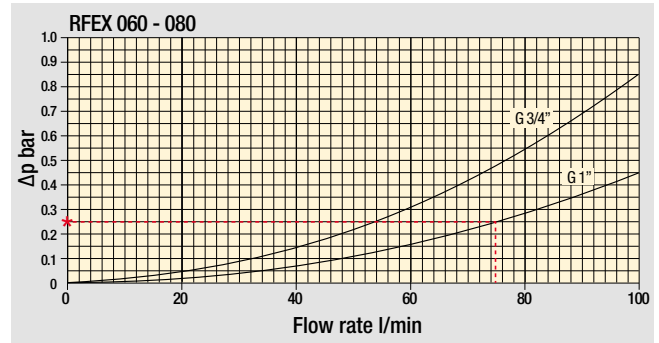
Oil density = $0.86 \text{ kg}/\text{dm}^3$

Required filtration efficiency = $25 \mu\text{m}$ with absolute filtration

1" inlet connection

Calculation:

$\Delta p_c = 0.25 \text{ bar}$ (see graphic below)



Filter housings Δp pressure drop.

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

$$\Delta p_e = (2.56 : 1000) \times 75 \times (46 : 30) = 0.29 \text{ bar}$$

SFEX - RFEX - LFEX 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 $30 \text{ mm}^2/\text{s}$

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 RFEX return filters

$$\Delta p_{\text{Tot.}} = 0.25 + 0.29 = 0.54 \text{ bar}$$

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

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

Description

Technical data

Low & Medium Pressure filters

Maximum working pressure up to 1.6 MPa (16 bar)
Flow rate up to 300 l/min

LFEX 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" and SAE connections up to 1 5/8", for a maximum flow rate of 300 l/min
- 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
- NEW 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

Filter housing materials

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

Bypass valve

Opening pressure 350 kPa (3.5 bar) \pm 10%

Δp element type

- Microfibre filter elements - series N: 8 bar
- Fluid flow through the filter element from OUT to IN

Seals

Standard NBR series A

Temperature

From -25 °C to +110 °C

Note

LFEX filters are provided for vertical mounting



Weights [kg] and volumes [dm³]

Filter series	Weights [kg]	Volumes [dm ³]
LFEX 060	0.50	0.60
LFEX 080	0.95	0.80
LFEX 110	1.20	1.60
LFEX 160	1.70	2.00

Hydraulic symbols

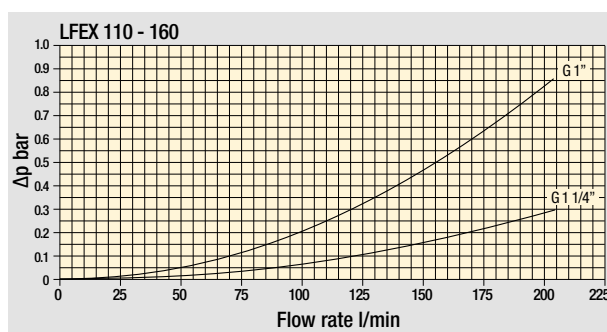
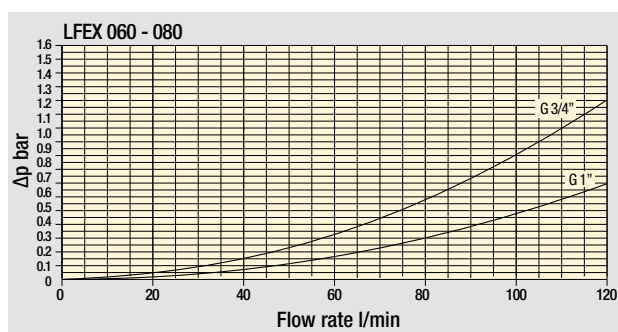
Filter series	Style S	Style B
LFEX 060	•	•
LFEX 080	•	•
LFEX 110	•	•
LFEX 160	•	•

OUT

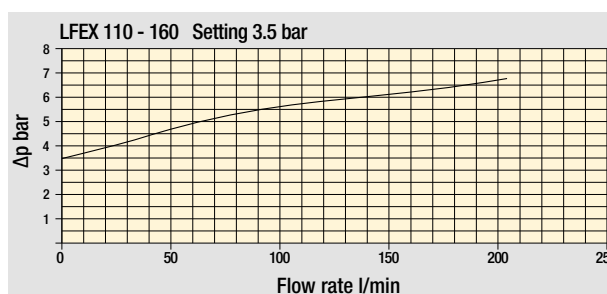
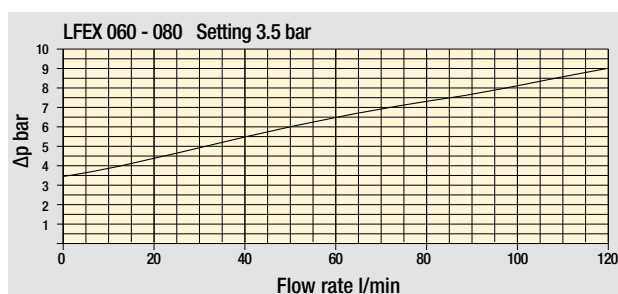
IN

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 in compliance with ISO 3968.
Δp varies proportionally with density.

Flow rates [l/min]

Filter element design - N Series

Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
LFE^X 060	45	47	65	66	68	84	84	86	67	73
LFE^X 080	58	59	73	72	76	86	87	88	79	82

Connections of filter under test G 3/4".

Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
LFE^X 060	49	51	75	77	80	104	105	107	74	95
LFE^X 080	67	67	86	87	92	107	108	110	96	112

Connections of filter under test G 1".

Filter series	A03	A06	A10	A16	A25	M25	M60	M90	P10	P25
LFE^X 110	107	115	182	195	216	295	298	300	232	242
LFE^X 160	146	150	210	212	237	300	303	304	254	262

Connections of filter under test G 1 1/4".

Maximum flow rate for a complete delivery filter with a pressure drop Δp = 0.7 bar.

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

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.

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: LFEX060							B	A	A	6	A10	N	P01
LFEX060														
LFEX080														
Bypass valve														
S	Without bypass													
B	3.5 bar													
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 for clogging indicator														
1	Without													
6	With plugged connections													
Filtration rating (filter media)														
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	Execution							
						N	P01 MP Filtri standard							
						8 bar	Pxx Customized							

FILTER ELEMENT

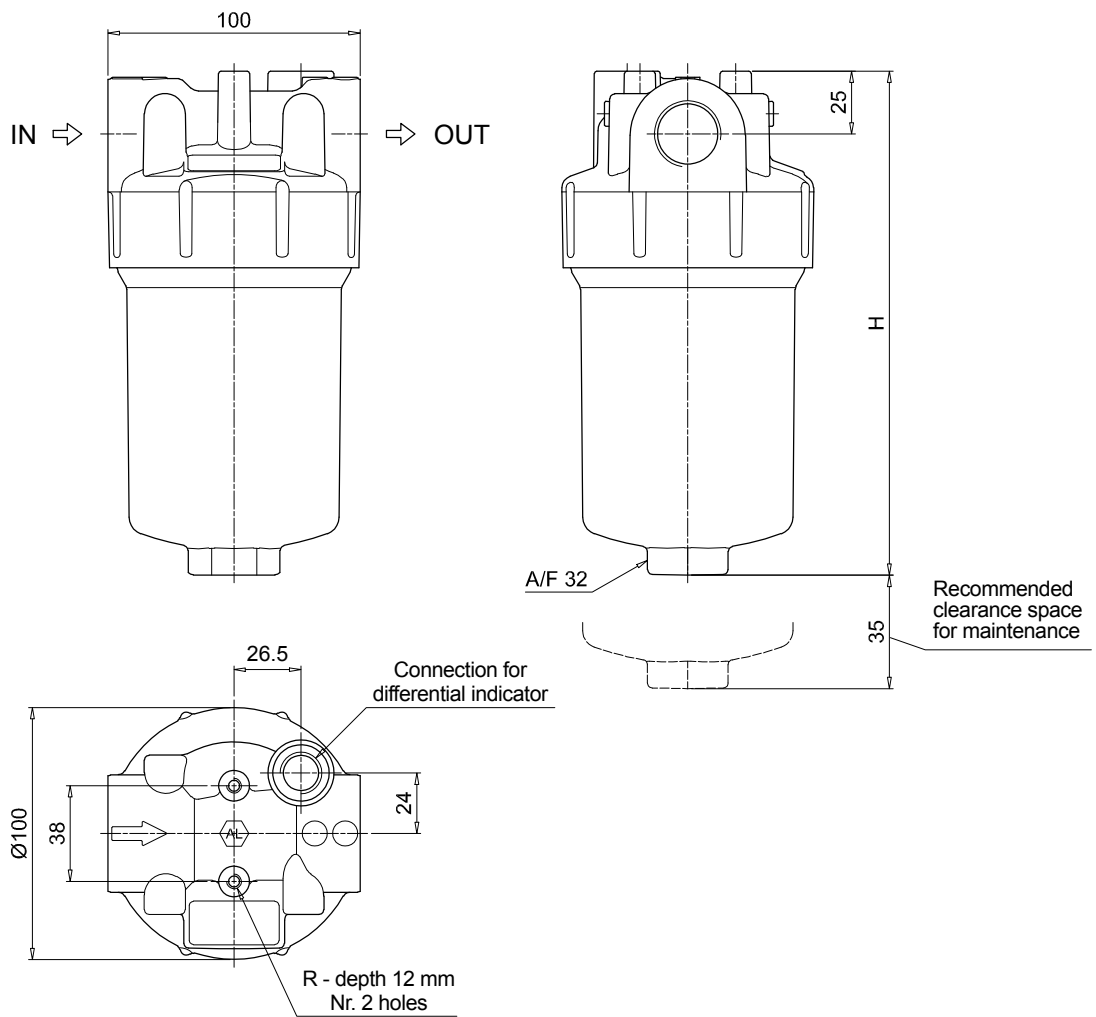
Element series and size	Configuration example: FEX060							A10	A	N	P01
FEX060											
FEX080											
Filtration rating (filter media)											
A03	Inorganic microfiber	3 µm	M25	Wire mesh	25 µm						
A06	Inorganic microfiber	6 µm	M60	Wire mesh	60 µm						
A10	Inorganic microfiber	10 µm	M90	Wire 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	Execution				
						N	P01 MP Filtri standard				
						8 bar	Pxx Customized				

ACCESSORIES

Differential indicators	page
DES Electrical differential indicator	36
DVS Visual differential indicator	37

Filter size	H [mm]
060	202
080	265

Connections	T	R
A	G 1/8"	M6
B	G 1/8"	M6
C	1/8" NPT	1/4" UNC
D	1/8" NPT	1/4" UNC
E	1/8" NPT	1/4" UNC
F	1/8" NPT	1/4" UNC



Designation & Ordering code

COMPLETE FILTER

Configuration example: **LFEX110** **B** **A** **A** **6** **A10** **N** **P01**

Series and size
LFEX110
LFEX160

Bypass valve
S Without bypass
B 3.5 bar

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 for clogging indicator
1 Without
6 With plugged connections

Filtration rating (filter media)

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 8 bar

Execution
P01 MP Filtri standard
Pxx Customized

FILTER ELEMENT

Configuration example: **FEX110** **A10** **A** **N** **P01**

Element series and size
FEX110
FEX160

Filtration rating (filter media)

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 8 bar

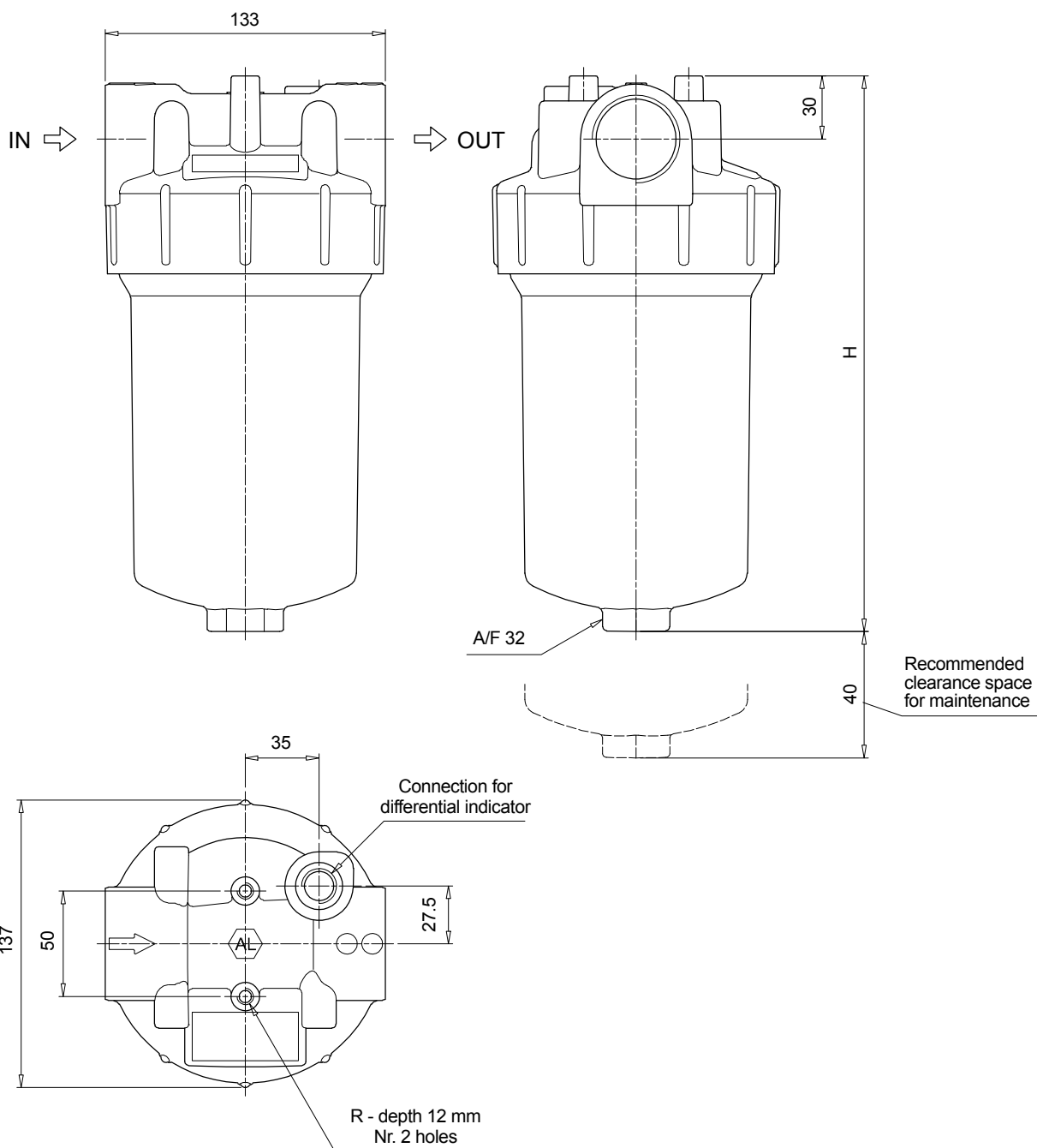
Execution
P01 MP Filtri standard
Pxx Customized

ACCESSORIES

Differential indicators	page
DES Electrical differential indicator	36
DVS Visual differential indicator	37

Filter size	H [mm]	
110	266	
160	315	

Connections	T	R
A	G 1/8"	M8
B	G 1/8"	M8
C	1/8" NPT	5/16" UNC
D	1/8" NPT	5/16" UNC
E	1/8" NPT	5/16" UNC
F	1/8" NPT	5/16" UNC

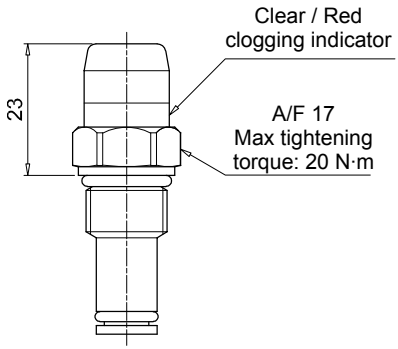


Dimensions

DES*10	
Electrical Differential Indicator	
Settings	Ordering code
2.5 bar \pm 10%	DE S 25 HA 10 P01
4.0 bar \pm 10%	DE S 40 HA 10 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 16 bar - Proof pressure: 24 bar - Burst pressure: 48 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP67 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: AMP Superseal series 1.5 - Resistive load: 0.2 A / 24 Vdc - Switching type: Normally open contacts (NC on request) 	

DES*30	
Electrical Differential Indicator	
Settings	Ordering code
2.5 bar \pm 10%	DE S 25 HA 30 P01
4.0 bar \pm 10%	DE S 40 HA 30 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 16 bar - Proof pressure: 24 bar - Burst pressure: 48 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP67 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Deutsch DT-04-2-P - Resistive load: 0.2 A / 24 Vdc - Switching type: Normally open contacts (NC on request) 	

DES*80	
Electrical Differential Indicator	
Settings	Ordering code
2.5 bar \pm 10%	DE S 25 HA 80 P01
4.0 bar \pm 10%	DE S 40 HA 80 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 16 bar - Proof pressure: 24 bar - Burst pressure: 48 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP67 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Stud #10-32 UNF - Resistive load: 0.2 A / 24 Vdc - Switching type: Normally open contacts (NC on request) 	

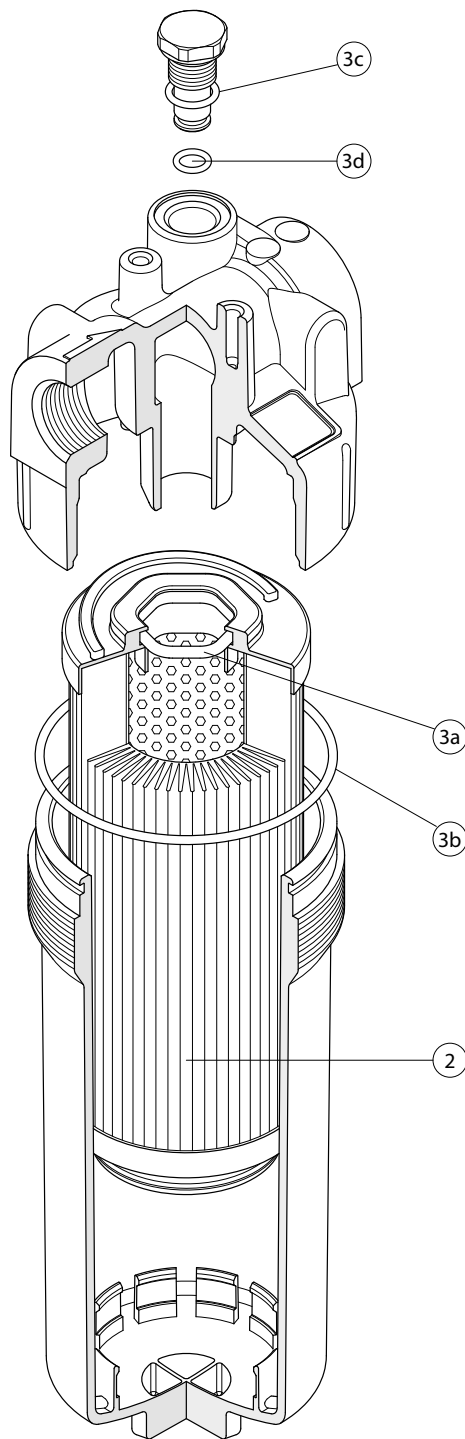
DVS		Hydraulic symbol	Materials
Visual Differential Indicator			
Settings	Ordering code		
2.5 bar ±10%	DV S 25 H P01	Technical data - Reset: Automatic reset - Max working pressure: 16 bar - Proof pressure: 24 bar - Burst pressure: 48 bar - Working temperature: From -25 °C to +110 °C - Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943 - Degree protection: IP67 according to EN 60529	
4.0 bar ±10%	DV S 40 H P01		
			

Designation & Ordering code

DIFFERENTIAL INDICATORS									
Series	Configuration example 1: DE S 25 H A 10 P01								
DE Electrical differential indicator	Configuration example 2: DV S 40 H P01								
DV Visual differential indicator									
Type									
S Compact version									
Pressure setting									
25 2.5 bar									
40 4.0 bar									
Seals									
H HNBR									
Thermostat	DE	DV							
A Without	•								
Electrical connections	DE	DV							
10 Connection AMP Superseal series 1.5	•								
30 Connection Deutsch DT-04-2-P	•								
80 Connection Stud #10-32 UNF	•								
Execution									
P01 MP Filtri standard									
Pxx Customized									

LFEX SPARE PARTS

Order number for spare parts



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	Q.ty: 1 pc.
	2	3 (3a ÷ 3d)	4
Filter series	Filter element	Seal Kit code number NBR	Indicator connection plug NBR
LFEX 060-080	See order table	02050771	T3H
LFEX 110-160		02050772	