



Return filters

RFEX series

Maximum working pressure up to 1.6 MPa (16 bar) - Flow rate up to 260 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)

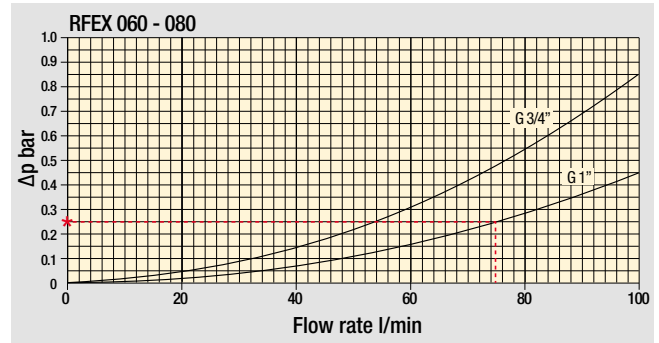
Oil density = $0.86 \text{ kg}/\text{dm}^3$

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

Return filter

Maximum working pressure up to 1.6 MPa (16 bar)
Flow rate up to 260 l/min

RFEX is a range of return filters for protection of the reservoir against the system contamination.
 They can be mounted in line or directly fixed to the tank cover to limit aeration or foam generation into the reservoir.

Available features:

- Female threaded connections up to 1 1/4" and SAE connections up to 1 5/8", for a maximum flow rate of 260 l/min
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical, axial and radial pressure gauges
- 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:

- Light Industrial equipment
- Mobile application

Filter housing materials

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

Bypass valve

Opening pressure 175 kPa (1.75 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

RFEX filters are provided for vertical mounting

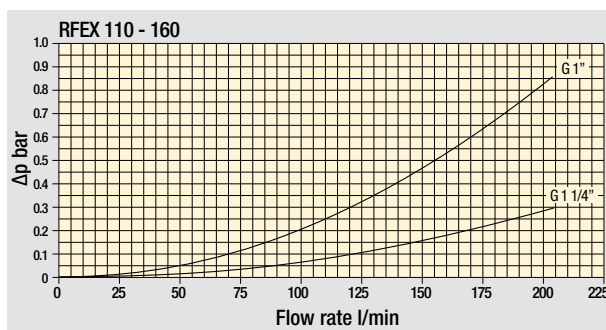
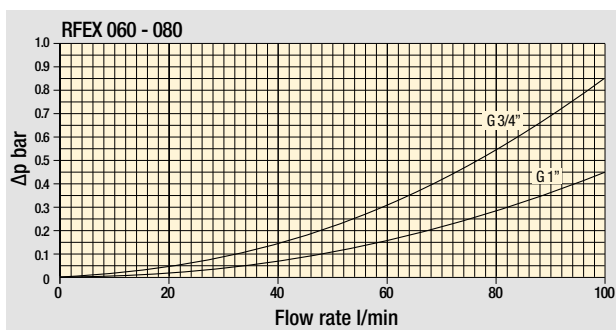


Weights [kg] and volumes [dm³]

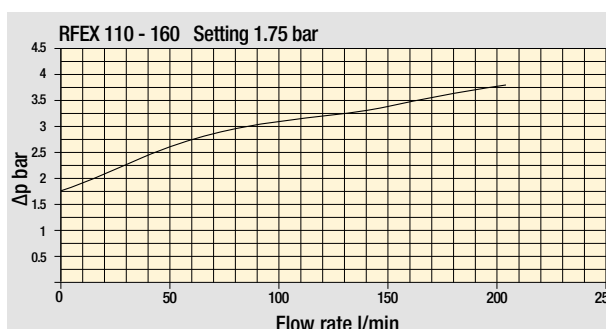
Filter series	Weights [kg]	Volumes [dm ³]
RFEX 060	0.50	0.60
RFEX 080	0.95	0.80
RFEX 110	1.20	1.60
RFEX 160	1.70	2.00

Hydraulic symbols

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



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.

Flow rates [l/min]

Filter element design - N Series

Filter series	A10	A16	A25	M60	M90	P10	P25
RFX 060	52	53	55	71	72	54	59
RFX 080	59	59	62	73	74	65	68

Connections of filter under test G 3/4".

Filter series	A10	A16	A25	M60	M90	P10	P25
RFX 060	60	61	64	87	89	62	77
RFX 080	69	70	75	91	92	79	93

Connections of filter under test G 1".

Filter series	A10	A16	A25	M60	M90	P10	P25
RFX 110	141	153	172	250	252	186	196
RFX 160	166	168	191	255	256	207	215

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

Maximum flow rate for a complete return filter with a pressure drop $\Delta p = 0.5 \text{ bar}$.

The reference fluid has a kinematic viscosity of $30 \text{ mm}^2/\text{s}$ (cSt) and a density of 0.86 kg/dm^3 .

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: RFEX060							B	A	A	6	A10	N	P01
RFEX060														
RFEX080														
Bypass valve														
S Without bypass														
B 1.75 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														
6 With plugged connections														
Filtration rating (filter media)														
A10 Inorganic microfiber 10 µm														
A16 Inorganic microfiber 16 µm														
A25 Inorganic microfiber 25 µm														
M60 Wire mesh 60 µm														
M90 Wire mesh 90 µm														
P10 Resin impregnated paper 10 µm														
P25 Resin impregnated paper 25 µm														
Element Δp														
N 8 bar														
Execution														
P01 MP Filtri standard														
Pxx Customized														

FILTER ELEMENT

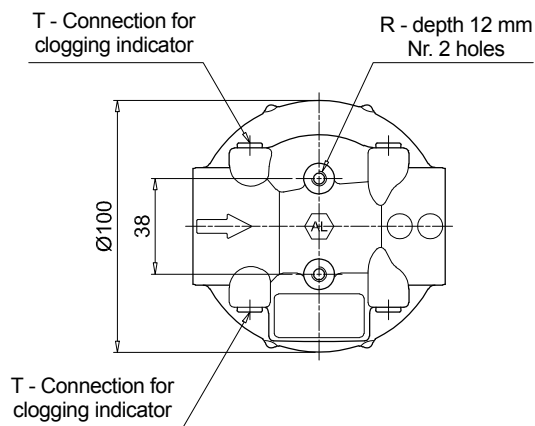
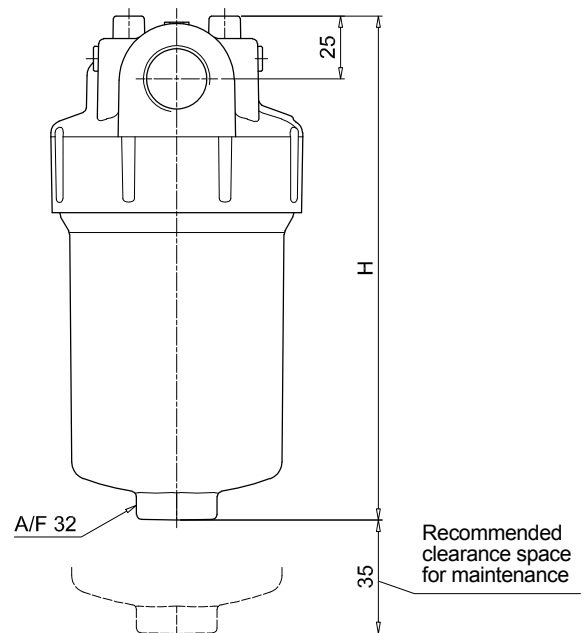
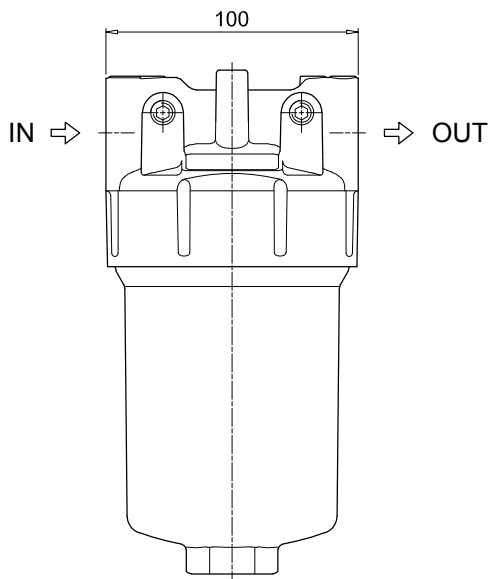
Element series and size	Configuration example: FEX060					A10	A	N	P01
FEX060									
FEX080									
Filtration rating (filter media)									
A10 Inorganic microfiber 10 µm									
A16 Inorganic microfiber 16 µm									
A25 Inorganic microfiber 25 µm									
M60 Wire mesh 60 µm									
M90 Wire mesh 90 µm									
P10 Resin impregnated paper 10 µm									
P25 Resin impregnated paper 25 µm									
Seals and treatments									
A NBR									
Element Δp									
N 8 bar									
Execution									
P01 MP Filtri standard									
Pxx Customized									

ACCESSORIES

Clogging indicators		page			page
BEA	Electrical pressure indicator	24	BVA	Axial pressure gauge	25
BEM	Electrical pressure indicator	24	BVR	Radial pressure gauge	25
BLA	Electrical / visual pressure indicator	24-25	BVP	Visual pressure indicator with automatic reset	26
			BVQ	Visual pressure indicator with manual reset	26

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

Series and size	Configuration example: RFEX110							
RFEX110	B	A	A	6	A10	N	P01	
RFEX160								
Bypass valve								
S Without bypass								
B 1.75 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								
6 With plugged connections								
Filtration rating (filter media)								
A10 Inorganic microfiber 10 µm								
A16 Inorganic microfiber 16 µm								
A25 Inorganic microfiber 25 µm								
M60 Wire mesh 60 µm								
M90 Wire mesh 90 µm								
P10 Resin impregnated paper 10 µm								
P25 Resin impregnated paper 25 µm								
	Element Δp				Execution			
	N 8 bar				P01 MP Filtri standard			
					Pxx Customized			

FILTER ELEMENT

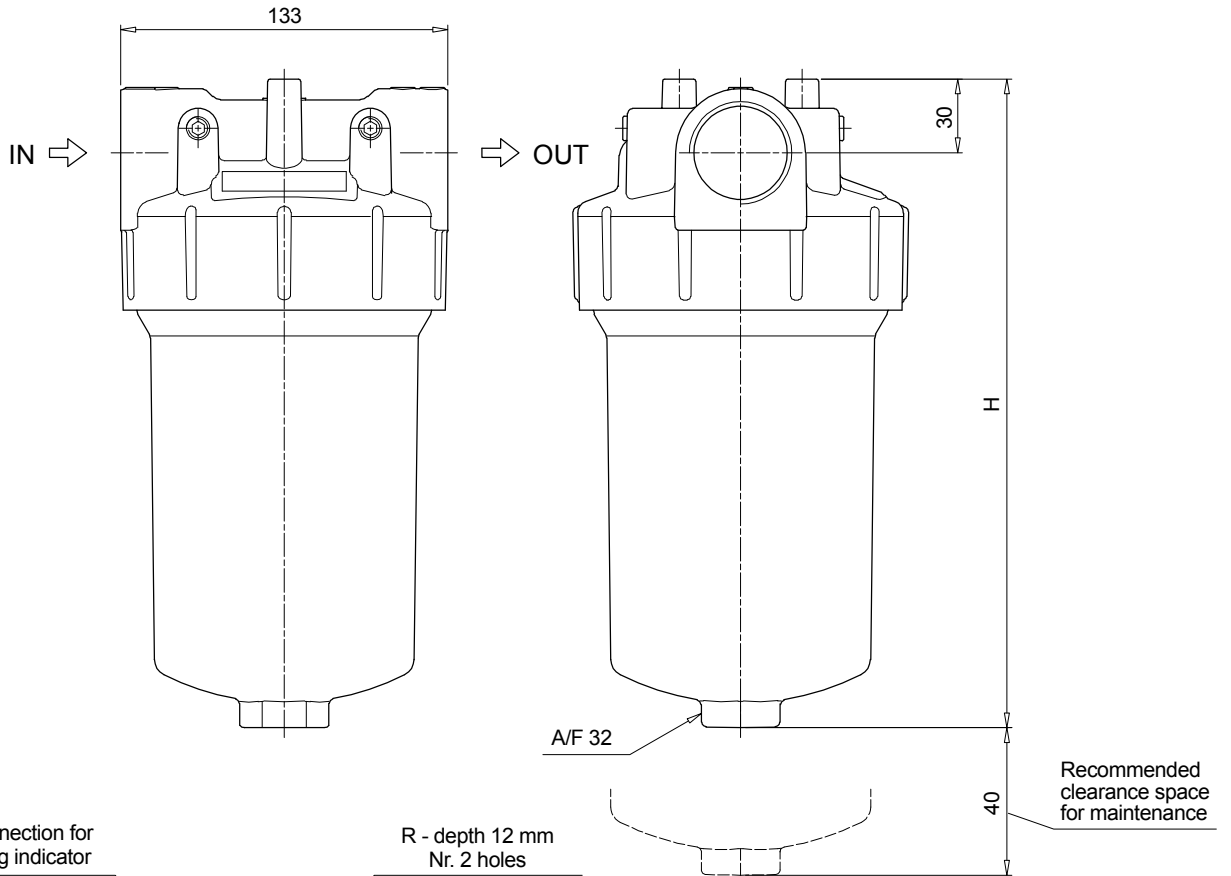
Element series and size	Configuration example: FEX110				
FEX110	A10	A	N	P01	
FEX160					
Filtration rating (filter media)					
A10 Inorganic microfiber 10 µm					
A16 Inorganic microfiber 16 µm					
A25 Inorganic microfiber 25 µm					
M60 Wire mesh 60 µm					
M90 Wire mesh 90 µm					
P10 Resin impregnated paper 10 µm					
P25 Resin impregnated paper 25 µm					
Seals and treatments					
A NBR					
	Element Δp			Execution	
	N 8 bar			P01 MP Filtri standard	
				Pxx Customized	

ACCESSORIES

Clogging indicators		page			page
BEA	Electrical pressure indicator	24	BVA	Axial pressure gauge	25
BEM	Electrical pressure indicator	24	BVR	Radial pressure gauge	25
BLA	Electrical / visual pressure indicator	24-25	BVP	Visual pressure indicator with automatic reset	26
			BVQ	Visual pressure indicator with manual reset	26

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

BEA*50	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BE A 15 H A 50 P01
2.0 bar ±10%	BE A 20 H A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - 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 according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac <p>- Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx°C X </p> <p>- CE certification</p>	

BEM*41	
Electrical Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BE M 15 H A 41 P01
2.0 bar ±10%	BE M 20 H A 41 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - 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 according to ISO 2943 - Degree of protection: IP67 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: Four-core cable - Resistive load: 5 A / 14 Vdc 4 A / 30 Vdc 5 A / 125 Vac 4 A / 250 Vac <p>- CE certification On request this indicator can be provided with main connectors in use for wirings.</p>	

BL*51 - BL*52 - BL*53	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar ±10%	BL A 15 H A xx P01
2.0 bar ±10%	BL A 20 H A xx P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Transparent Nylon - Contacts: Silver - Seal: HNBR 	
<p>Technical data</p> <ul style="list-style-type: none"> - 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 according to ISO 2943 - Degree of protection: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Type: BL51 BL52 BL53 - Lamps: 24 Vdc 110 Vdc 230 Vac - Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc 1 A / 230 Vac 	

BL*71	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar $\pm 10\%$	BL A 15 HA 71 P01
2.0 bar $\pm 10\%$	BL A 20 HA 71 P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: HNBR

Technical data

- 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 according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data

- Electrical connection: IEC 61076-2-101 D (M12)
- Lamps: 24 Vdc
- Resistive load: 0.4 A / 24 Vdc

BVA	
Axial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BV A 14 P01
2.5 bar $\pm 10\%$	BV A 25 P01

Hydraulic symbol

Dial scale

BV A 14 P01

BV A 25 P01

Materials

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

Technical data

- 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 according to ISO 2943
- Accuracy: Class 2.5 according to EN 13190
- Degree of protection: IP31 according to EN 60529

BVR	
Radial Pressure Gauge	
Settings	Ordering code
1.4 bar $\pm 10\%$	BV R 14 P01
2.5 bar $\pm 10\%$	BV R 25 P01

Hydraulic symbol

Dial scale

BV R 14 P01

BV R 25 P01

Materials

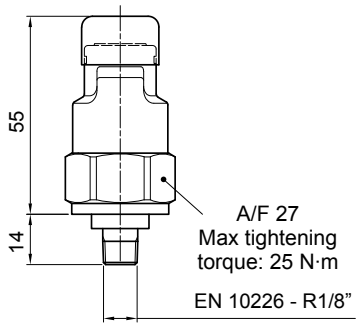
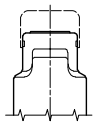
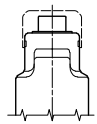
- Case: Painted Steel
- Window: Transparent plastic
- Dial: Painted Steel
- Pointer: Painted Aluminium
- Pressure connection: Brass
- Pressure element: Bourdon tube Cu-alloy soft soldered

Technical data

- 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 according to ISO 2943
- Accuracy: Class 2.5 according to EN 13190
- Degree of protection: IP31 according to EN 60529

RFEX BAROMETRIC INDICATORS

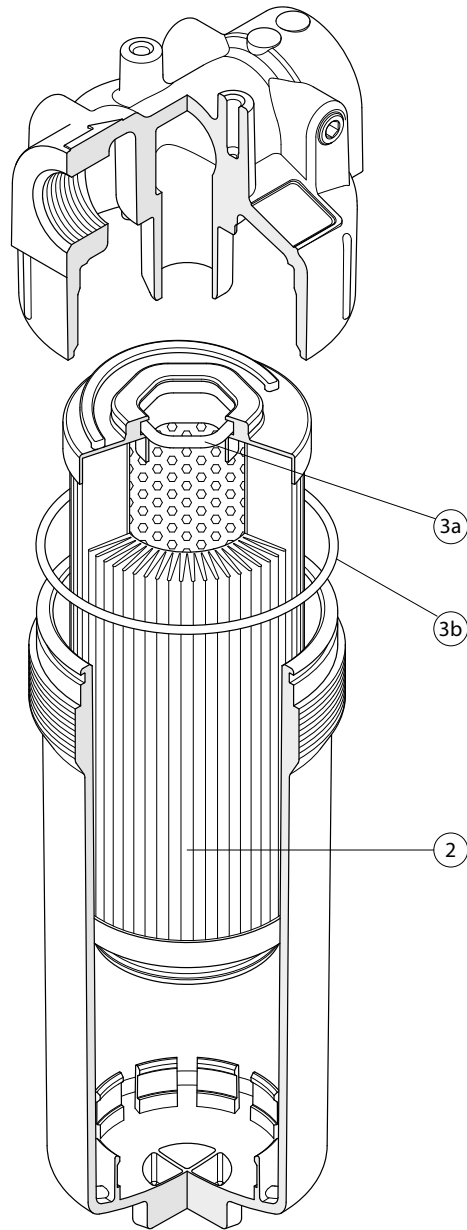
Dimensions

BVP - BVQ		Hydraulic symbol	Materials
Visual Pressure Indicator			
Setting	Ordering code		
1.5 bar ±10%	BV P 15 H P01		Technical data - Reset: BVP - Automatic reset BVQ - Manual reset - 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 according to ISO 2943 - Degree of protection: IP45 according to EN 60529
	BV Q 15 H P01		
2.0 bar ±10%	BV P 20 H P01	Signals	 Absence of pressure (no indicator)
	BV Q 20 H P01		
		 Clogged filter element (red button risen)	

Designation & Ordering code

BAROMETRIC INDICATORS

Series	Configuration example 1: BE M 15 H A 41 P01						
BE Electrical pressure indicator	Configuration example 2: BL A 20 H A 71 P01						
BL Electrical/Visual pressure indicator	Configuration example 3: BV R 14 [] [] [] P01						
BV Visual pressure indicator	Configuration example 4: BV P 20 H [] [] [] P01						
Type	BE	BL	BV				
A Standard type	•	•	A Axial connection pressure gauge				
M With wired electrical connection	•		R Radial connection pressure gauge				
			P Visual indicator with automatic reset				
			Q Visual indicator with manual reset				
Pressure setting	BEA-BEM	BLA	BVA-BVR	BVP-BVQ			
14 1.4 bar			•				
15 1.5 bar	•	•					
20 2.0 bar	•	•		•			
25 2.5 bar			•				
Seals	BE	BLA	BVA-BVR	BVP-BVQ			
H HNBR	•	•		•			
Thermostat	BEA-BEM	BLA	BV				
A Without	•	•					
Electrical connections	BEA	BEM	BL	BV			
41 Connection via four-core cable		•					
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			•				
53 Connection EN 175301-803, transparent base with lamps 230 Vdc			•				
71 Connection IEC 61076-2-101 D (M12), black base with lamps 24 Vdc			•				
Option							
P01 MP Filtri standard							
Pxx Customized							



Item:	Q.ty: 1 pc. 2	Q.ty: 1 pc. 3 (3a ÷ 3b)
Filter series	Filter element	Seal Kit code number NBR
RFX 060-080	See order table	02050771
RFX 110-160		02050772