Suction filters

SFEX series

Flow rate up to 100 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 Δpc of the housing is proportional to the fluid density (kg/dm³); all the graphs in the catalogue are referred to mineral oil with density of 0.86 kg/dm³.
The filter element pressure drop Δpe is proportional to its viscosity (mm²/s); the corrective factor Y have to be used in case of an oil viscosity different than 30 mm²/s (cSt).

Sizing data for single filter element

Δpc = Filter housing pressure drop [bar]
Δpe = 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 mm²/s (cSt)
V2 = operating oil viscosity in mm²/s (cSt)

Filter element pressure drop calculation with an oil viscosity different than 30 mm²/s (cSt)

Δpe = Y : 1000 x Q x (V2:V1)
Δp Tot. = Δpc + Δpe

Verification formula

Δp Tot. ≤ Δp max allowed

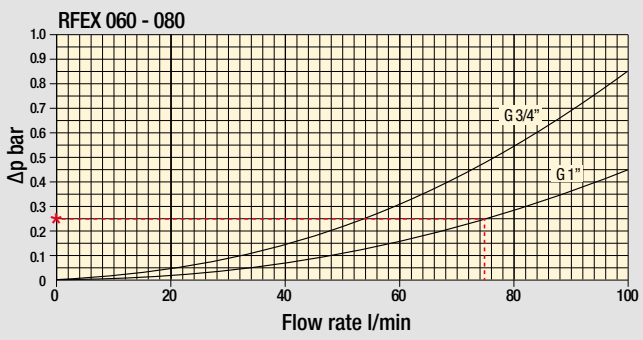
Maximum total pressure drop (Δp max) allowed by a new and clean filter

Application	Range (bar)
Suction filters	0.08 ÷ 0.10
Return filters	0.4 ÷ 0.6
Low & Medium Pressure filters	0.4 ÷ 0.6 return lines
	0.3 ÷ 0.5 lubrication lines
	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 Pmax = 10 bar
Flow rate Q = 75 l/min
Viscosity V2 = 46 mm²/s (cSt)
Oil density = 0.86 kg/dm³
Required filtration efficiency = 25 µm with absolute filtration
1" inlet connection

Calculation:
Δpc = 0.25 bar (see graphic below)



Filter housings Δp 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.

Δpe = (2.56 : 1000) x 75 x (46 : 30) = 0.29 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 mm²/s

Filter element	Absolute filtration N Series							Nominal filtration N Series			
Type	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

Δp Tot. = 0.25 + 0.29 = 0.54 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.

SFEX GENERAL INFORMATION

Description

Suction filters

Flow rate up to 100 l/min

SFEX are range of suction filters for protection of the downstream pump against the coarse contamination.
They are placed below the minimum oil level, directly connected to the suction line of the pump.
They can be fitted on the side or below the tank, always in-line mounted.

Available features:
- Female threaded connections up to 1 1/4" and SAE connections up to 1 5/8", for a maximum flow rate of 100 l/min
- Bypass valve, to relieve excessive pressure drop across the filter media
- Visual, electrical, axial and radial vacuum 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 application:
- Mobile machines
- Industrial equipment

Technical data

Filter housing materials
- Head: Aluminium
- Bypass valve: Nylon - Steel
- Bowl: Nylon

Bypass valve
Opening pressure 30 kPa (0.3 bar) ±10%

Elements
Fluid flow through the filter element from OUT to IN

Seals
Standard NBR series A

Temperature
From -25 °C to +110 °C

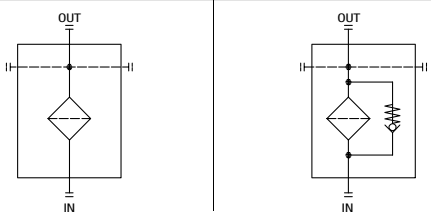
Note
SFEX filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]	Volumes [dm³]
SFEX 060	0.50	0.60
SFEX 080	0.95	0.80
SFEX 110	1.20	1.60
SFEX 160	1.70	2.00

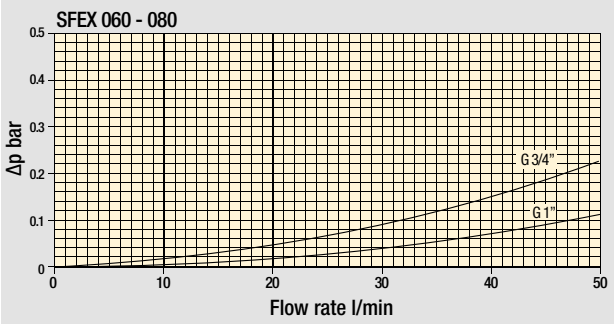
Hydraulic symbols

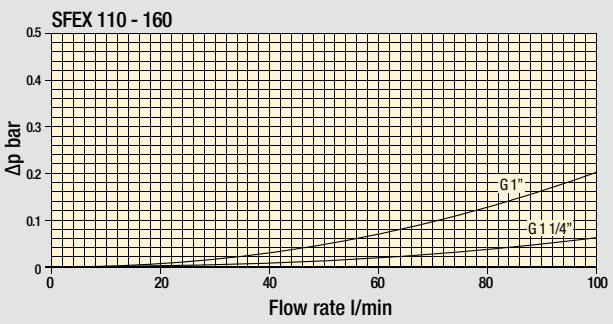
Filter series	Style S	Style B
SFEX 060	•	•
SFEX 080	•	•
SFEX 110	•	•
SFEX 160	•	•



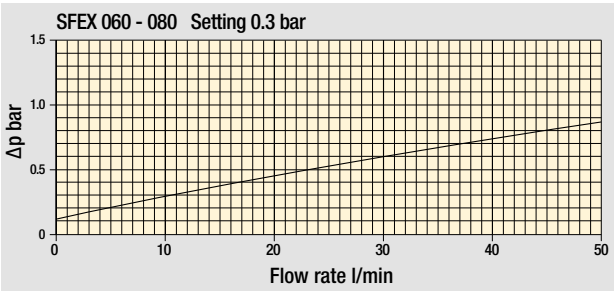
Pressure drop

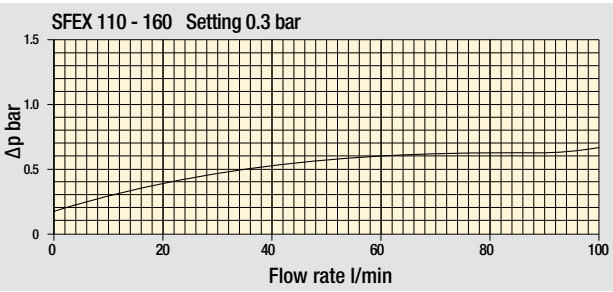
Filter housings
Δp pressure drop





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.

Flow rates [l/min]

Filter element design - N Series

Filter series	M60	M90	M250	P10	P25
SFEX 060	26	27	27	14	17
SFEX 080	28	29	29	21	23

Connections of filter under test G 3/4".

Filter series	M60	M90	M250	P10	P25
SFEX 060	31	33	33	13	20
SFEX 080	34	35	35	24	30

Connections of filter under test G 1".

Filter series	M60	M90	M250	P10	P25
SFEX 110	93	96	96	48	53
SFEX 160	98	99	99	60	65

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

Maximum flow rate for a complete suction filter with a pressure drop Δp = 0.08 bar.
The reference fluid has a kinematic viscosity of 30 mm^2/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.

SFEX SFEX060 - SFEX080

Designation & Ordering code

COMPLETE FILTER

Configuration example : SFEX060 | B | A | A | 6 | M60 | N | P01

Series and size
- **SFEX060**
- **SFEX080**

Bypass valve
- **S** Without bypass
- **B** 0.3 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)

M60	Wire mesh	60 µm	**P10**	Resin impregnated paper	10 µm
M90	Wire mesh	90 µm	**P25**	Resin impregnated paper	25 µm
M250	Wire mesh	250 µm			

Element Δp
- **N** 8 bar

Execution
- **P01** MP Filtri standard
- **Pxx** Customized

FILTER ELEMENT

Configuration example: FEX060 | M60 | A | N | P01

Element series and size
- **FEX060**
- **FEX080**

Filtration rating (filter media)

M60	Wire mesh	60 µm	**P10**	Resin impregnated paper	10 µm
M90	Wire mesh	90 µm	**P25**	Resin impregnated paper	25 µm
M250	Wire mesh	250 µm			

Seals and treatments
- **A** NBR

Element Δp
- **N** 8 bar

Execution
- **P01** MP Filtri standard
- **Pxx** Customized

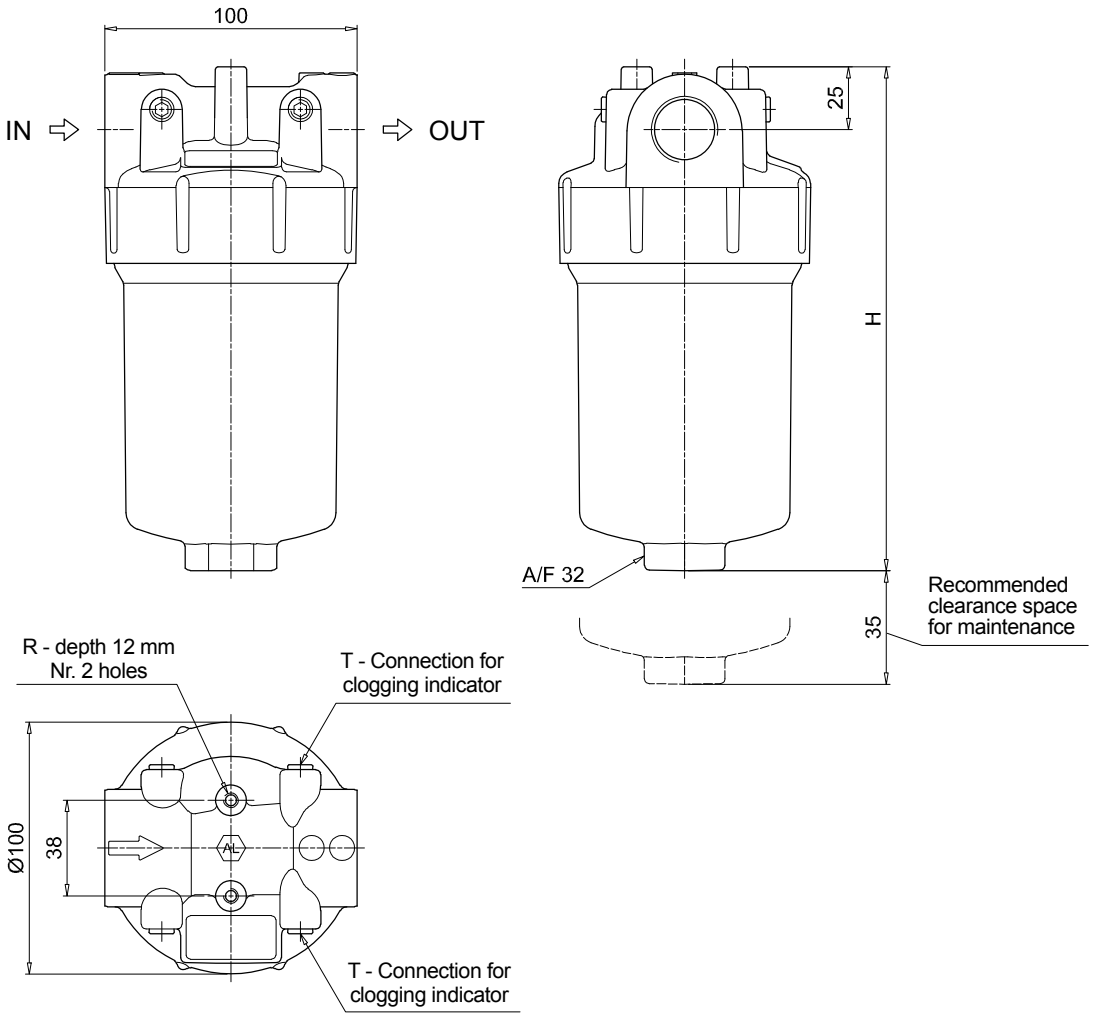
ACCESSORIES

Clogging indicators

Dimensions

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



SFEX SFEX110 - SFEX160

Designation & Ordering code

COMPLETE FILTER

Configuration example : SFEX110 | B | A | A | 6 | M60 | N | P01

Series and size
- **SFEX110**
- **SFEX160**

Bypass valve
- **S** Without bypass
- **B** 0.3 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)
- **M60** Wire mesh 60 µm
- **M90** Wire mesh 90 µm
- **M250** Wire mesh 250 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

Configuration example: FEX110 | M60 | A | N | P01

Element series and size
- **FEX110**
- **FEX160**

Filtration rating (filter media)
- **M60** Wire mesh 60 µm
- **M90** Wire mesh 90 µm
- **M250** Wire mesh 250 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

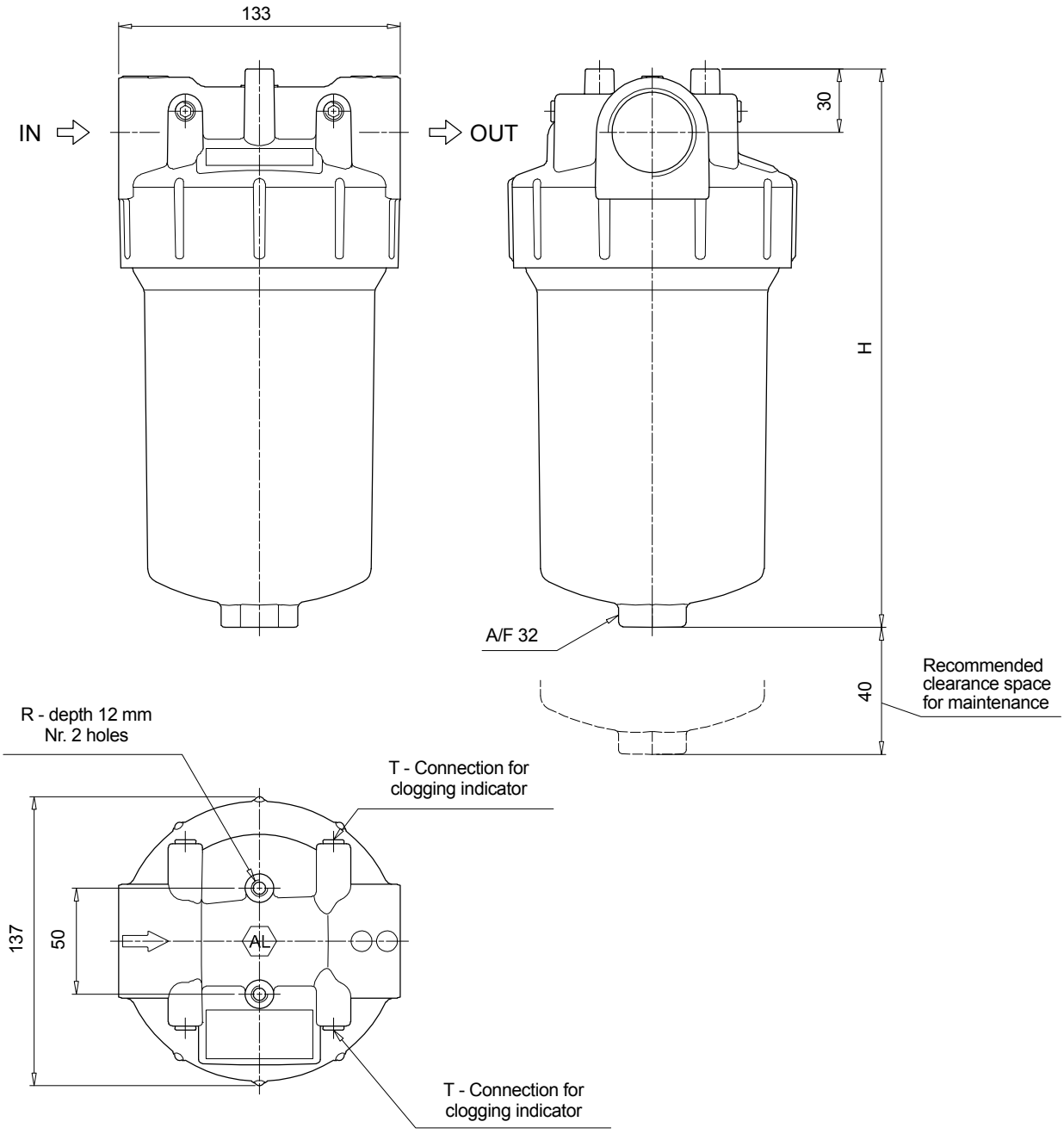
ACCESSORIES

Clogging indicators

Dimensions

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

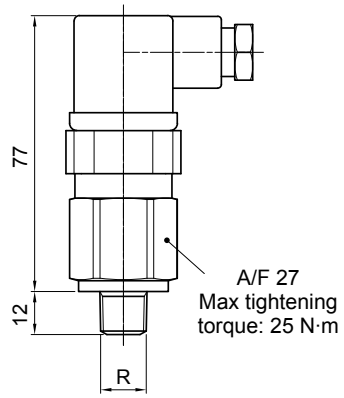


Dimensions

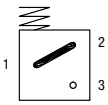
VE*50

Electrical Vacuum Indicator

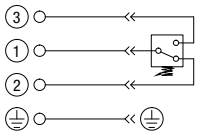
R	Ordering code
EN 10226 - R1/8"	VE B 21 A A 50 P01



Hydraulic symbol



Electrical symbol



Materials
- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: NBR

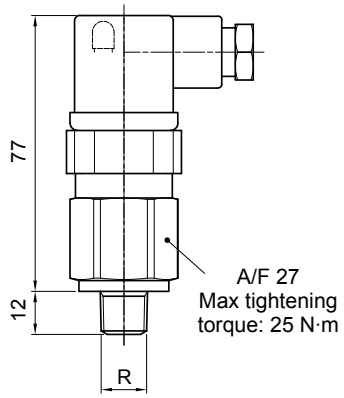
Technical data
- Vacuum setting: -0.21 bar ±10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

Electrical data
- Electrical connection: EN 175301-803
- Resistive load: 5 A / 14 Vdc
  4 A / 30 Vdc
  5 A / 125 Vac
  4 A / 250 Vac
- Available Atex product: II 1GD Ex ia IIC Tx Ex ia IIIC Tx°C X
- CE certification

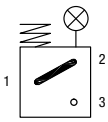
VL*51 - VL*52 - VL*53

Electrical/Visual Vacuum Indicator

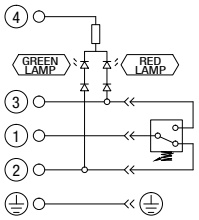
R	Ordering code
EN 10226 - R1/8"	VL B 21 A A xx P01



Hydraulic symbol



Electrical symbol



Materials
- Body: Brass
- Base: Transparent Nylon
- Contacts: Brass - Nylon
- Seal: NBR

Technical data
- Vacuum setting: -0.21 bar ±10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

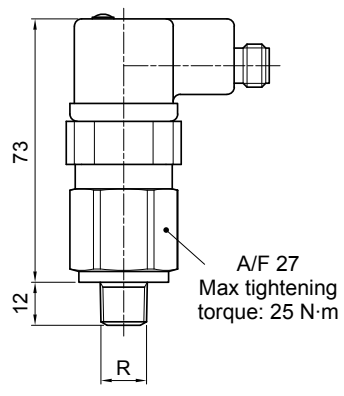
Electrical data

- Electrical connection:	EN 175301-803		
- Type	VL51	VL52	VL53
- Lamps	24 Vdc	110 Vdc	230 Vac
- Resistive load:	1 A / 24 Vdc	1 A / 110 Vdc	1 A / 230 Vac

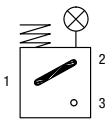
VL*71

Electrical/Visual Vacuum Indicator

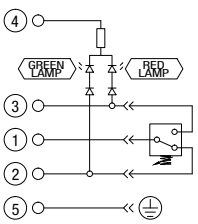
Connections	Ordering code
EN 10226 - R1/8"	VL B 21 A A 71 P01



Hydraulic symbol



Electrical symbol



Materials
- Body: Brass
- Base: Black Nylon
- Contacts: Silver
- Seal: NBR

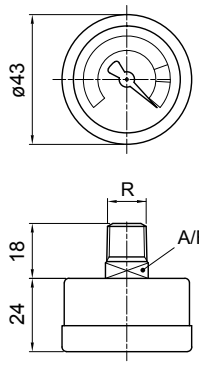
Technical data
- Vacuum setting: -0.21 bar ±10%
- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

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

VVB

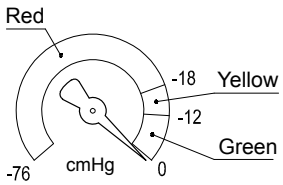
Axial Vacuum Gauge

R	Ordering code
EN 10226 - R1/8"	VV B 16 P01



Hydraulic symbol

Dial scale



Conversion to SI units

[cmHg]	[bar]
-12	-0.16
-18	-0.24
-76	-1.01

Materials

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

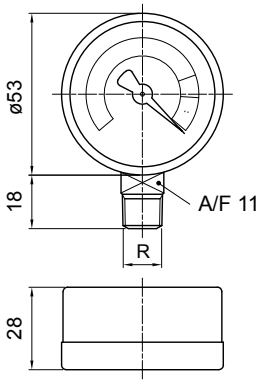
Technical data

- 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

VVS

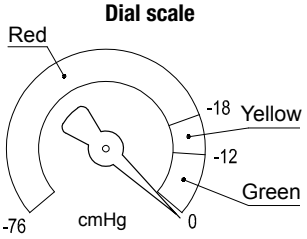
Radial Vacuum Gauge

R	Ordering code
EN 10226 - R1/8"	VV S 16 P01



Hydraulic symbol

Dial scale



Conversion to SI units

[cmHg]	[bar]
-12	-0.16
-18	-0.24
-76	-1.01

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

Designation & Ordering code

VACUUM INDICATORS

Configuration example 1:	VE	B	21	A	A	50	P01
Configuration example 2:	VL	B	21	A	A	71	P01
Configuration example 3:	VV	S	16				P01

Series

- **VE** Electrical vacuum indicator
- **VL** Electrical/Visual vacuum indicator
- **VV** Vacuum gauge

Type VE - VL

- **B** Connection EN 10226 - R1/8"

Type VV

- **B** Axial connection EN 10226 - R1/8"
- **S** Radial connection EN 10226 - R1/8"

Vacuum setting	VE	VL	VV
16 0.16 bar			•
21 0.21 bar	•	•	

Seals	VE	VL	VV
A NBR	•	•	

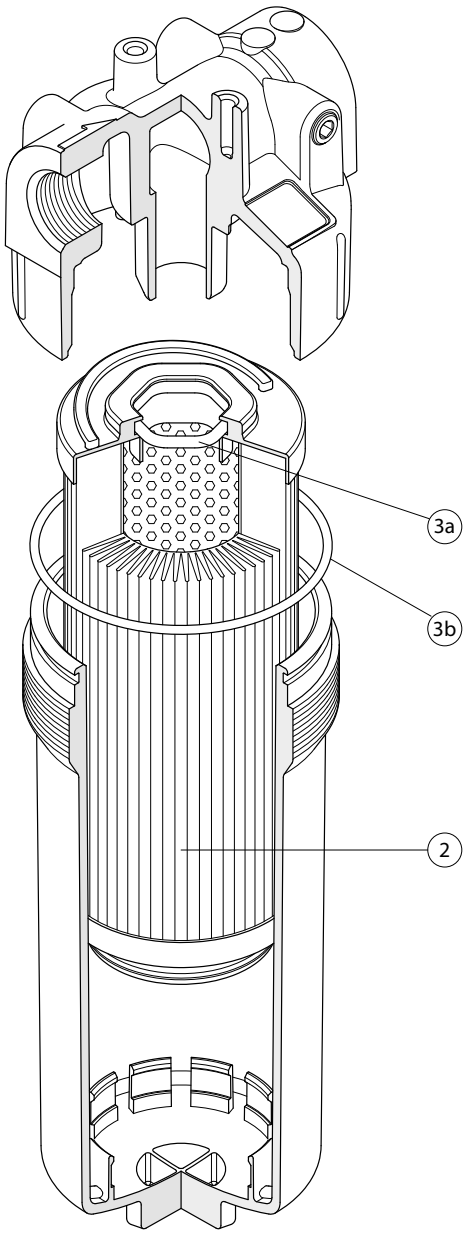
Thermostat	VE	VL	VV
A Without	•	•	

Electrical connections	VE	VL	VV
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

Order number for spare parts



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