

HYDRAULIC FILTRATION PRODUCTS

RETURN / SUCTION FILTERS



PASSION TO PERFORM



FILTER SIZING

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THE CORRECT FILTER SIZING HAS TO BE BASED ON THE TOTAL PRESSURE DROP DEPENDING BY THE APPLICATION.

FOR EXAMPLE, THE MAXIMUM TOTAL PRESSURE DROP ALLOWED BY A NEW AND CLEAN RETURN 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). The filter element pressure drop Δp_e is proportional to its viscosity (mm^2/s / SUS), 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 bar	1.16 - 1.45 psi
Return filters	0.4 - 0.6 bar	5.80 - 8.70 psi
Return - Suction filters (*)	0.8 - 1.0 bar	11.60 - 14.50 psi
Low & Medium Pressure filters	0.4 - 0.6 bar	5.80 - 8.70 psi return lines
	0.3 - 0.5 bar	4.35 - 7.25 psi lubrication lines
	0.3 - 0.4 bar	4.35 - 5.80 psi off-line in power systems
	0.1 - 0.3 bar	1.45 - 4.35 psi off-line in test benches
High Pressure filters	0.4 - 0.6 bar	5.80 - 8.7 psi over-boost
	0.8 - 1.5 bar	11.60 - 21.75 psi
Stainless Steel filters	0.8 - 1.5 bar	11.60 - 21.75 psi

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

Generic filter calculation example

Application data:

Tank top return filter

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

Flow rate $Q = 120$ l/min

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

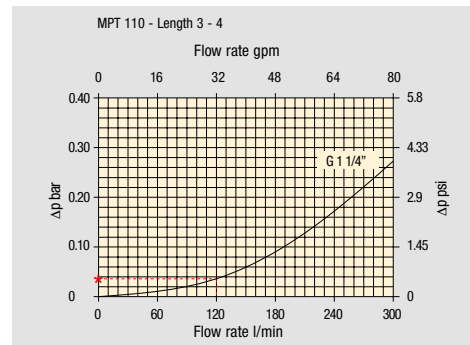
Oil density = $0.86 \text{ kg}/\text{dm}^3$

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

With bypass valve and G 1 1/4" inlet connection

Calculation:

$\Delta p_c = 0.03 \text{ bar} / 0.43 \text{ psi}$ (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.

$$\Delta p_e = (2.00 : 1000) \times 120 \times (46 : 30) = 0.37 \text{ bar}$$

$$\Delta p_e = (2.00 : 17.2) \times 32 \times (216 : 150) = 5.36 \text{ psi}$$

Filter element	Absolute filtration H Series					Nominal filtration N Series			
	A03	A06	A10	A16	A25	P10	P25	M25 M60 M90	
Return filters	74.00	50.08	20.00	16.00	9.00	6.43	5.51	4.40	
MF 020	2	29.20	24.12	8.00	7.22	5.00	3.33	2.85	2.00
	3	22.00	19.00	6.56	5.33	4.33	1.68	1.44	1.30
MF 030 MFX 030	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	3.40
MF 100 MFX 100	1	28.20	24.40	8.67	8.17	6.88	4.62	3.96	1.25
	2	17.33	12.50	6.86	5.70	4.00	3.05	2.47	1.10
	3	10.25	9.00	3.65	3.33	2.50	1.63	1.32	0.96
	4	6.10	5.40	2.30	2.20	2.00	1.19	0.96	0.82

$$\Delta p_{\text{Tot.}} = 0.03 + 0.37 = 0.4 \text{ bar}$$

$$\Delta p_{\text{Tot.}} = 0.43 + 5.36 = 5.79 \text{ psi}$$

The selection is correct because the total pressure drop value is inside the admissible range for top tank 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.

FILTER SIZING 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

Return filters

Filter element	Absolute filtration H Series					Nominal filtration N Series			
	Type	A03	A06	A10	A16	A25	P10	P25	M25 M60 M90
MF 020	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	4.40
	2	29.20	24.12	8.00	7.22	5.00	3.33	2.85	2.00
	3	22.00	19.00	6.56	5.33	4.33	1.68	1.44	1.30
MF 030 MFX 030	1	74.00	50.08	20.00	16.00	9.00	6.43	5.51	3.40
MF 100 MFX 100	1	28.20	24.40	8.67	8.17	6.88	4.62	3.96	1.25
	2	17.33	12.50	6.86	5.70	4.00	3.05	2.47	1.10
	3	10.25	9.00	3.65	3.33	2.50	1.63	1.32	0.96
	4	6.10	5.40	2.30	2.20	2.00	1.19	0.96	0.82
MF 180 MFX 180	1	3.67	3.05	1.64	1.56	1.24	1.18	1.06	0.26
	2	1.69	1.37	0.68	0.54	0.51	0.43	0.39	0.12
MF 190 MFX 190	2	1.69	1.37	0.60	0.49	0.44	0.35	0.31	0.11
MF 400 MFX 400	1	3.20	2.75	1.39	1.33	1.06	0.96	0.87	0.22
	2	2.00	1.87	0.88	0.85	0.55	0.49	0.45	0.13
	3	1.90	1.60	0.63	0.51	0.49	0.39	0.35	0.11
MF 750 MFX 750	1	1.08	0.84	0.49	0.36	0.26	0.21	0.19	0.06
MLX 250	2	3.00	3.04	1.46	1.25	1.17	-	-	M25 0.20
MLX 660	2	1.29	1.26	0.52	0.44	0.38	-	-	M25 0.10
CU 025		78.00	48.00	28.00	24.00	9.33	9.33	8.51	1.25
CU 040		25.88	20.88	10.44	10.00	3.78	3.78	3.30	1.25
CU 100		15.20	14.53	5.14	4.95	2.00	2.00	0.17	1.10
CU 250		3.25	2.55	1.55	1.35	0.71	0.71	0.59	0.25
CU 630		1.96	1.68	0.85	0.72	0.42	0.42	0.36	0.09
CU 850		1.06	0.84	0.42	0.33	0.17	0.17	0.13	0.04
DH 250	2	3.61	4.08	1.81	1.71	1.35	-	-	M25 0.55
	4	2.10	1.70	1.14	0.77	0.53	-	-	0.60
MR 100	1	19.00	17.00	6.90	6.30	4.60	2.94	2.52	1.60
	2	11.70	10.80	4.40	4.30	3.00	2.94	2.52	1.37
	3	7.80	6.87	3.70	3.10	2.70	2.14	1.84	1.34
	4	5.50	4.97	2.60	2.40	2.18	1.72	1.47	1.34
	5	4.20	3.84	2.36	2.15	1.90	1.60	1.37	1.34
MR 250	1	5.35	4.85	2.32	1.92	1.50	1.38	1.20	0.15
	2	4.00	3.28	1.44	1.10	1.07	0.96	0.83	0.13
	3	2.60	2.20	1.08	1.00	0.86	0.77	0.64	0.12
	4	1.84	1.56	0.68	0.56	0.44	0.37	0.23	0.11
MR 630	1	3.10	2.48	1.32	1.14	0.92	0.83	0.73	0.09
	2	2.06	1.92	0.82	0.76	0.38	0.33	0.27	0.08
	3	1.48	1.30	0.60	0.56	0.26	0.22	0.17	0.08
	4	1.30	1.20	0.48	0.40	0.25	0.21	0.16	0.08
	5	0.74	0.65	0.30	0.28	0.13	0.10	0.08	0.04
MR 850	1	0.60	0.43	0.34	0.25	0.13	0.12	0.09	0.03
	2	0.37	0.26	0.23	0.21	0.11	0.08	0.07	0.03
	3	0.27	0.18	0.17	0.17	0.05	0.04	0.04	0.02
	4	0.23	0.16	0.13	0.12	0.04	0.03	0.03	0.02

Return / Suction filters

Filter element	Absolute filtration			
	Type	A10	A16	A25
RSX 116	1	5.12	4.33	3.85
	2	2.22	1.87	1.22
RSX 165 RSX 166	1	2.06	1.75	1.46
	2	1.24	1.05	0.96
	3	0.94	0.86	0.61

Filter element	Absolute filtration N Series								
	Type	A03	A06	A10	A16	A25	P10	P25	M25 M60 M90
CU 110	1	16.25	15.16	8.75	8.14	5.87	2.86	2.65	0.14
	2	12.62	10.44	6.11	6.02	4.16	1.60	1.49	0.12
	3	8.57	7.95	5.07	4.07	2.40	1.24	1.15	0.11
	4	5.76	4.05	2.80	2.36	1.14	0.91	0.85	0.05

Low & Medium pressure filters

Filter element	Absolute filtration N-W Series					Nominal filtration N Series			
	Type	A03	A06	A10	A16	A25	P10	P25	M25
CU 110	1	16.25	15.16	8.75	8.14	5.87	2.86	2.65	0.14
	2	12.62	10.44	6.11	6.02	4.15	1.60	1.49	0.12
	3	8.57	7.95	5.07	4.07	2.40	1.24	1.15	0.11
	4	5.76	4.05	2.80	2.36	1.14	0.91	0.85	0.05
CU 210	1	5.30	4.80	2.00	1.66	1.32	0.56	0.43	0.12
	2	3.44	2.95	1.24	1.09	0.70	0.42	0.35	0.09
	3	2.40	1.70	0.94	0.84	0.54	0.33	0.23	0.05
DN	016	7.95	7.20	3.00	2.49	1.98	0.84	0.65	0.18
	025	5.00	4.53	1.89	1.57	1.25	0.53	0.41	0.11
	040	3.13	2.66	1.12	0.98	0.63	0.38	0.32	0.08
CU 400	2	3.13	2.55	1.46	1.22	0.78	0.75	0.64	0.19
	3	2.15	1.70	0.94	0.78	0.50	0.40	0.34	0.10
	4	1.60	1.28	0.71	0.61	0.40	0.34	0.27	0.08
	5	1.00	0.83	0.47	0.34	0.20	0.24	0.19	0.06
	6	0.82	0.58	0.30	0.27	0.17	0.22	0.18	0.05
CU 900	1	0.86	0.63	0.32	0.30	0.21	-	-	0.05
CU 950	2	1.03	0.80	0.59	0.40	0.26	-	-	0.05
	3	0.44	0.40	0.27	0.18	0.15	-	-	0.02
MR 630	7	0.88	0.78	0.36	0.34	0.16	0.12	0.96	0.47

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

High pressure filters

Filter element	Absolute filtration N - R Series					Nominal filtration N Series	
	Type	A03	A06	A10	A16	A25	M25
HP 011	1	332.71	250.07	184.32	152.36	128.36	-
	2	220.28	165.56	74.08	59.13	37.05	-
	3	123.24	92.68	41.48	33.08	20.72	-
	4	77.76	58.52	28.37	22.67	16.17	-
HP 039	2	70.66	53.20	25.77	20.57	14.67	4.90
	3	36.57	32.28	18.00	13.38	8.00	2.90
	4	26.57	23.27	12.46	8.80	5.58	2.20
HP 050	1	31.75	30.30	13.16	12.3	7.29	1.60
	2	24.25	21.26	11.70	9.09	4.90	1.40
	3	17.37	16.25	8.90	7.18	3.63	1.25
	4	12.12	10.75	6.10	5.75	3.08	1.07
	5	7.00	6.56	3.60	3.10	2.25	0.80
HP 065	1	58.50	43.46	23.16	19.66	10.71	1.28
	2	42.60	25.64	16.22	13.88	7.32	1.11
	3	20.50	15.88	8.18	6.81	3.91	0.58
HP 135	1	20.33	18.80	9.71	8.66	4.78	2.78
	2	11.14	10.16	6.60	6.38	2.22	1.11
	3	6.48	6.33	3.38	3.16	2.14	1.01
HP 150	1	17.53	15.91	7.48	6.96	5.94	1.07
	2	8.60	8.37	3.54	3.38	3.15	0.58
	3	6.53	5.90	2.93	2.79	2.12	0.49
HP 320	1	10.88	9.73	5.02	3.73	2.54	1.04
	2	4.40	3.83	1.75	1.48	0.88	0.71
	3	2.75	2.11	1.05	0.87	0.77	0.61
	4	2.12	1.77	0.98	0.78	0.55	0.47
HP 500	1	4.44	3.67	2.30	2.10	1.65	0.15
	2	3.37	2.77	1.78	1.68	1.24	0.10
	3	2.22	1.98	1.11	1.09	0.75	0.08
	4	1.81	1.33	0.93	0.86	0.68	0.05
	5	1.33	1.15	0.77	0.68	0.48	0.04
Absolute filtration - N Series							
Type	A03	A06	A10	A16	A25	M25	
HF 325	1	3.65	2.95	2.80	1.80	0.90	0.38
	2	2.03	1.73	1.61	1.35	0.85	0.36
	3	1.84	1.42	1.32	1.22	0.80	0.35

Suction filters

Nominal filtration - N Series						
Type	P10	P25	M25	M60	M90	M250
SF 250	0.65	0.20	0.10	0.08	0.05	0.03
SF 503	-	-	0.17	0.11	0.11	0.11
SF 504	-	-	0.11	0.08	0.08	0.08
SF 505	-	-	0.23	0.18	0.18	0.18
SF 510	-	-	0.18	0.14	0.14	0.14
SF 535	-	-	0.08	0.05	0.05	0.05
SF 540	-	-	0.05	0.04	0.04	0.04

Stainless steel high pressure filters

Filter element	Absolute filtration N Series					
	Type	A03	A06	A10	A16	A25
HP 011	1	332.71	250.07	184.32	152.36	128.36
	2	220.28	165.56	74.08	59.13	37.05
	3	123.24	92.68	41.48	33.08	20.72
	4	77.76	58.52	28.37	22.67	16.17
HP 039	2	70.66	53.20	25.77	20.57	14.67
	3	36.57	32.28	18.00	13.38	8.00
	4	26.57	23.27	12.46	8.80	5.58
HP 050	1	31.75	30.30	13.16	12.3	7.29
	2	24.25	21.26	11.70	9.09	4.90
	3	17.37	16.25	8.90	7.18	3.63
	4	12.12	10.75	6.10	5.75	3.08
	5	7.00	6.56	3.60	3.10	2.25
HP 135	1	20.33	18.80	9.71	8.66	4.78
	2	11.14	10.16	6.60	6.38	2.22
	3	6.48	6.33	3.38	3.16	2.14
Absolute filtration H - U Series						
Type	A03	A06	A10	A16	A25	
HP 011	1	424.58	319.74	235.17	194.44	163.78
	2	281.06	211.25	94.53	75.45	47.26
	3	130.14	97.50	43.63	34.82	21.81
	4	109.39	82.25	36.79	29.37	18.40
HP 039	2	73.00	57.00	28.00	24.00	17.20
	3	40.90	36.33	21.88	18.80	11.20
	4	31.50	28.22	17.22	9.30	6.70
HP 050	1	47.33	34.25	21.50	20.50	14.71
	2	29.10	25.95	14.04	10.90	5.88
	3	20.85	19.50	10.68	8.61	4.36
	4	14.55	12.90	7.32	6.90	3.69
	5	9.86	9.34	6.40	4.80	2.50
HP 135	1	29.16	25.33	13.00	12.47	5.92
	2	14.28	11.04	7.86	7.60	4.44
	3	8.96	7.46	4.89	4.16	3.07

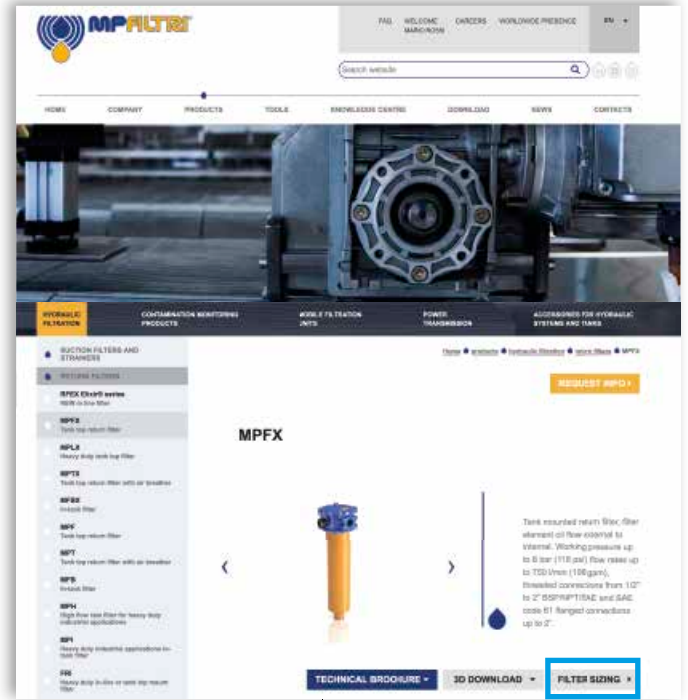
TYPICAL FILTER SIZING Selection Software

Step ①

Select "FILTER SIZING SOFTWARE" after login

OR

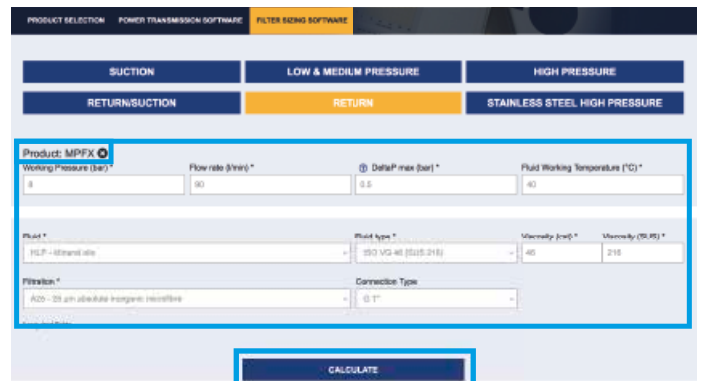
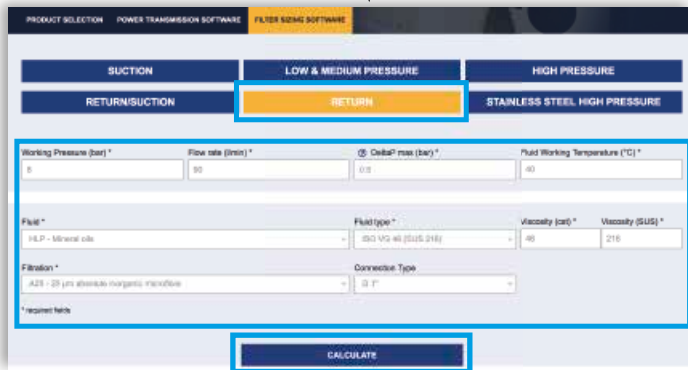
Select "FILTER SIZING" after login from a product page



Choose the type of filter family.
Enter the main data for sizing the filter
then push CALCULATE.

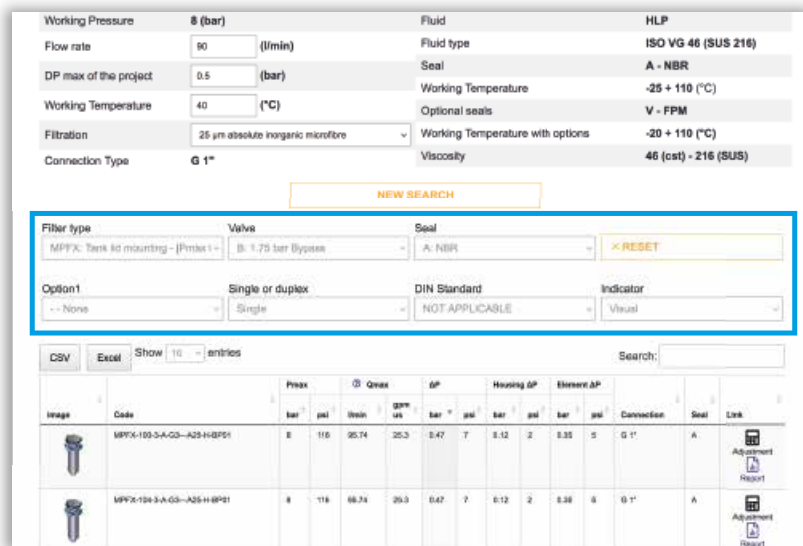
Step ②

Enter the main data for sizing the filter
then push CALCULATE.



Step ③

Select the desired options to choose the appropriate filter type for the application.



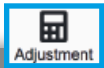
Step 4

Choose the most suitable filter from the proposed list.

Image	Code	Peak bar	Qmax gal/min	ΔP bar	Housing ΔP bar	Element ΔP bar	Connection	Seal	Link			
	MPFX-103-3-A-Q3-A25-H-BPFI	8	116	25.74	25.3	0.47	T	0.12 2	0.33 5	G 1"	A	Adjustment Report
	MPFX-104-3-A-Q3-A25-H-BPFI	8	116	25.74	25.3	0.47	T	0.12 2	0.33 5	G 1"	A	Adjustment Report

Step 5

It is possible to change the filter modifying every parameter.



A SAVE YOUR FILTER'S REPORT



B MANUAL EDIT



SAVE IN YOUR ARCHIVE
typing your reference data and then SAVE AS PDF



A new browser window displays the pdf

see A

Close the report window



By clicking your WELCOME button, the SHOW REPORTS is displayed: select it to see your filters list.

Hydraulic combined filters for installation on the return and suction lines of hydrostatic transmissions (HSTs) for commercial vehicles, construction machinery, agricultural vehicles, and mobile work equipment with hydrostatic drive.

Advantage for the installation:

- **Space-saving assembly**
- **Reduced assembly time**
- **Fewer connections to the tank**
- **Protection from the pollution of the tank**

Advantages for the operativity:

- **Absolute filtration of the oil for the hydrostatic drive**
- **Fulfilment of the purity requirements according to ISO 4406, as specified by the manufacturer of the driving drives.**
- **Protection against damages from cavitation even under adverse conditions, i.e. cold start**
- **Less formation of free air in the system**
- **Easier maintenance operations (one spare filter element instead of two)**

FILTER SIZING

For the proper corrective factor Y see chapter at page 24

Return / Suction filters



MRSX	page 283
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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.

MRSX series

with MYCLEAN RSX Filter Element



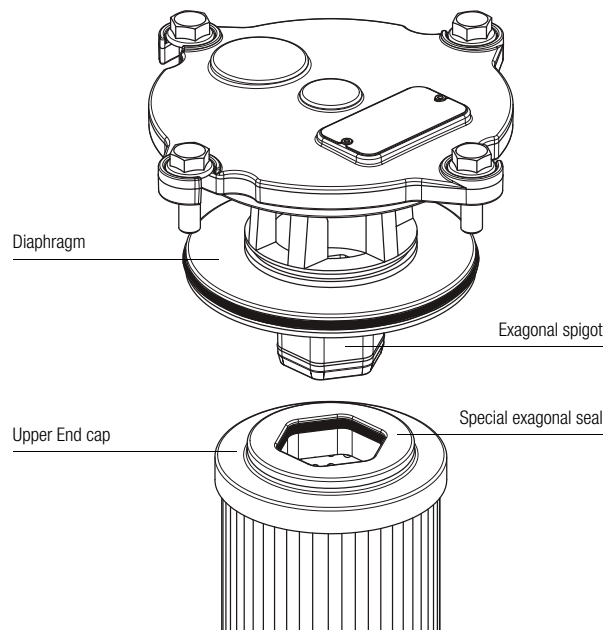
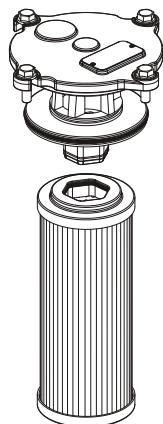
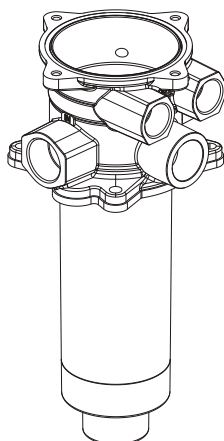
- **Protects the machine from improper use of non-original products.**
- **Safety of constant quality protection & reliability**

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 MRSX are protected by:

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



MRSX series

Maximum working pressure up to 1 MPa (10 bar) - Flow rate up to 250 l/min



Description

Technical data

Return / Suction filter

Tank mounted

Maximum working pressure up to 1 MPa (10 bar)
Flow rate up to 250 l/min

MRSX is a range of suction/return filters for hydraulic systems with two or more circuits (both open and closed loops). They are able to provide pressurized oil cleaned by fine filtration to the feed pump of the hydrostatic systems.

They are directly fixed to the reservoir, in immersed or semi-immersed position.

The filter output must be always immersed into the fluid to avoid aeration or foam generation into the reservoir.

Available features:

- Female threaded return connections up to 1 1/4", for a maximum return flow rate of 250 l/min
- Multiple connections, to connect several return and suction lines
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve to the tank, to relieve excessive pressure drop across the filter media when the return flow is enough higher than the suction flow
- Bypass valve to the suction line with additional suction filter element, to relieve excessive pressure drop across the filter media when the return flow is not enough higher than the suction flow
- De-pressurization valve, to reduce the pressure inside the filter during the maintenance operations
- Anti-cavitation valve with additional suction filter element, to ensure fluid to the feed pump of the hydrostatic systems during cold starts or initial filling
- O-ring or Flat Seal to suit a variety of reservoir surfaces
- Reservoir side mounting, to save space in the machines
- Visual, electrical and electronic clogging indicators
- MYclean interface connection, 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:

Mobile machines with hydrostatic systems on board
 (i.e. skid steer loaders, telehandlers, dumpers, road sweepers)

Filter housing materials

- Head: Aluminium
- Cover
 Polyamide: MRSX 116
 Aluminium: MRSX 165-166
- Bowl: Polyamide

Δp element type

- RSX: 10 bar
- Oil flow from exterior to interior.

Seals

- Standard NBR series A
- Optional FPM series V

Temperature

From -25 °C to +110 °C

FILTER ASSEMBLY SIZING

Flow rates [l/min]

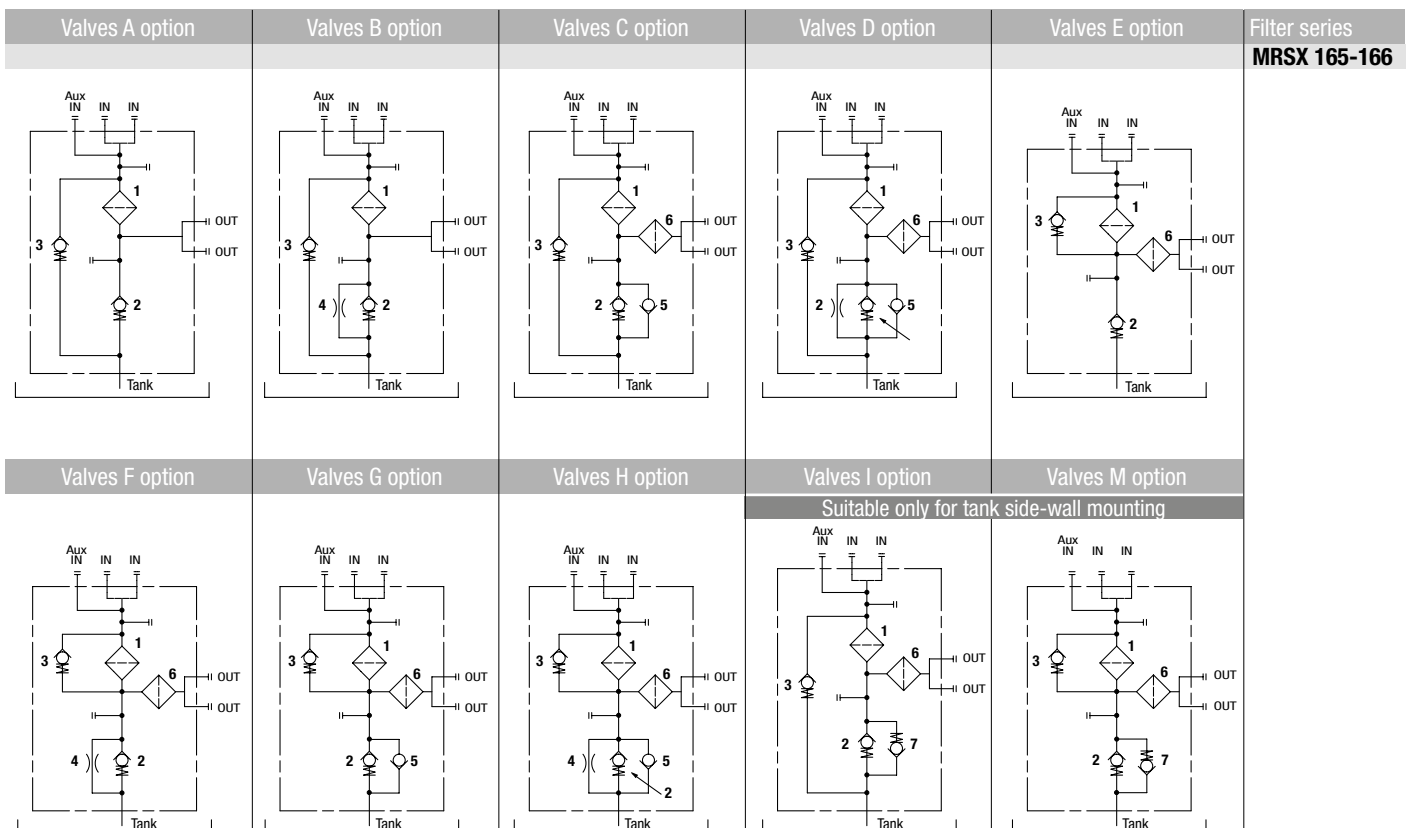
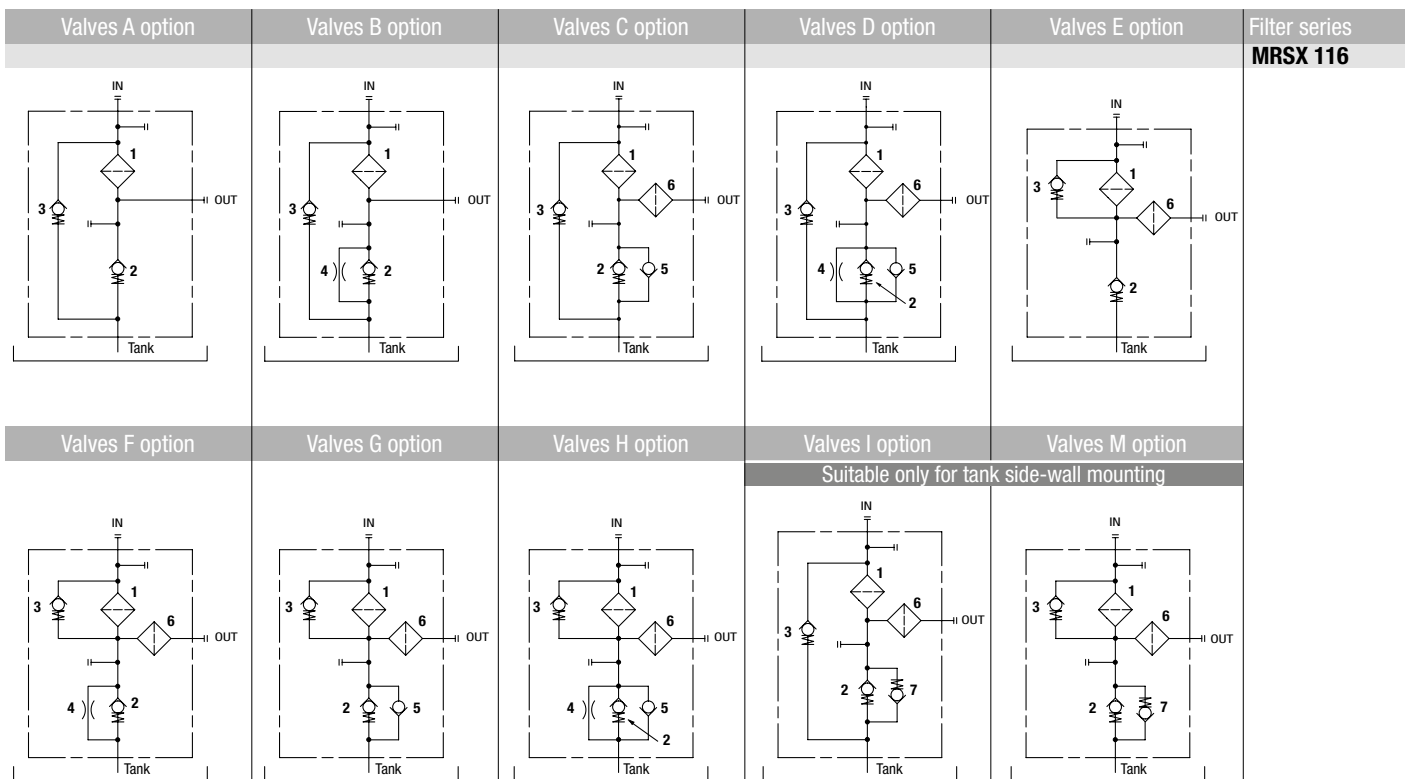
Filter series	Length	A10	A16	A25
MRSX 116	1	74	82	87
	2	108	113	124
MRSX 165 - 166	1	155	166	178
	2	187	196	200
	3	201	205	217

Maximum flow rate for a complete return/suction filter with a pressure drop Δp = 1 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.mpfiltr.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.



LEGEND

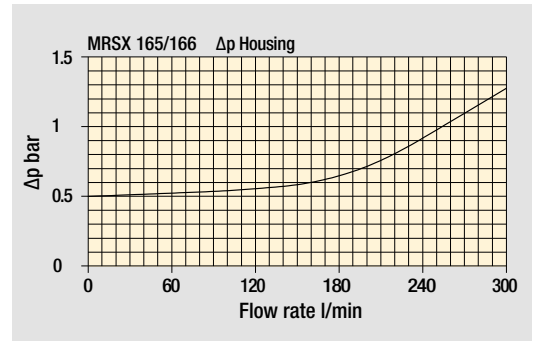
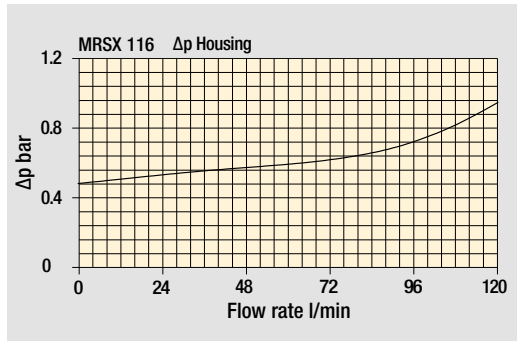
- 1 - Filter element
- 2 - Back-Pressure valve: opening pressure 0.5 bar \pm 10%
- 3 - Bypass valve: opening pressure 2.5 bar \pm 10%
- 4 - Depressurization valve

- 5 - Anti-Cavitation valve
- 6 - Safety filter element (wire mesh 60 μ m)
- 7 - Anti-Cavitation valve / Anti-Emptying valve

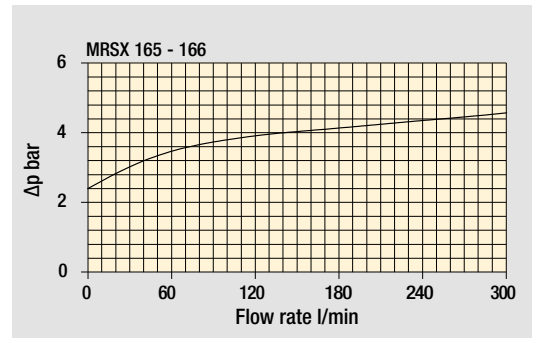
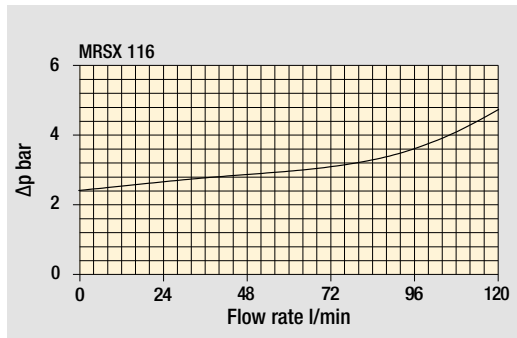
MRSX GENERAL INFORMATION

Pressure drop

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.

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]			Volumes [dm ³]				
	Length	1	2	3	Length	1	2	3
MRSX 116		1.30	1.40	-		0.80	1.00	-
MRSX 165		3.40	3.80	4.10		2.00	2.60	3.00
MRSX 166		3.40	3.80	4.10		2.00	2.60	3.00

Designation & Ordering code

COMPLETE FILTER

Series and size **MRSX116** Filter featuring **MY CLEAN** Filter Element Configuration example: **MRSX116** **1** **B** **A** **G1** **0** **A16** **B** **P01**

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

Hydraulic diagram configuration - see page 285

Bypass valve to tank				Bypass valve to OUT			
A	B	C	D	•	-	-	-
E	F	G	H	-	-	•	-
I				•	-	-	-
M				-	-	•	-

Seals and treatments

A NBR, O-Ring on head	B NBR, flat seal on head
V FPM, O-Ring on head	D FPM, flat seal on head

Connections IN	Connections OUT
G1 G 3/4"	G 3/4"
G2 G 1"	G 1"
G3 3/4" NPT	3/4" NPT
G4 1" NPT	1" NPT
G5 SAE 12 - 1 1/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN
G6 SAE 16 - 1 5/16" - 12 UN	SAE 16 - 1 5/16" - 12 UN
D1 G 1"	G 3/4"
D2 1" NPT	3/4" NPT
D3 SAE 16 - 1 5/16" - 12 UN	SAE 12 - 1 1/16" - 12 UN

Aux IN connection **0** Without aux IN connection

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm

A16 Inorganic microfiber 16 µm

A25 Inorganic microfiber 25 µm

Mounting position	Valves configuration									
	A	B	C	D	E	F	G	H	I	M
S Standard	•	•	•	•	•	•	•	•	-	-
B Tank side-wall mounting	•	•	-	-	•	•	-	-	•	•

Execution

P01 MP Filtri standard

Pxx Customized

FILTER ELEMENT

Element series and size **RSX116** Filter Element with **MY CLEAN** feature Configuration example: **RSX116** **1** **A16** **A** **P01**

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

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm

A16 Inorganic microfiber 16 µm

A25 Inorganic microfiber 25 µm

Seals

A NBR

V FPM

Execution

P01 MP Filtri standard

Pxx Customized

CLOGGING INDICATORS

See page 303

Indicators on Return Line

BVA Axial pressure gauge
BVR Radial pressure gauge
BVP Visual pressure indicator with automatic reset
BVQ Visual pressure indicator with manual reset

BEA Electrical pressure indicator
BEM Electrical pressure indicator
BET Electrical pressure indicator
BLA Electrical / visual pressure indicator

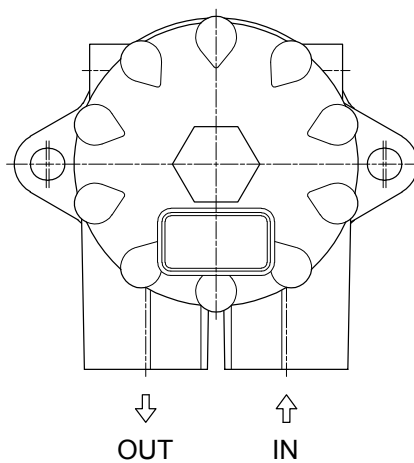
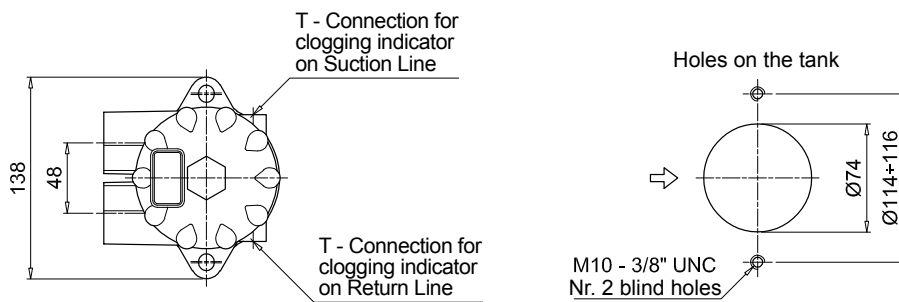
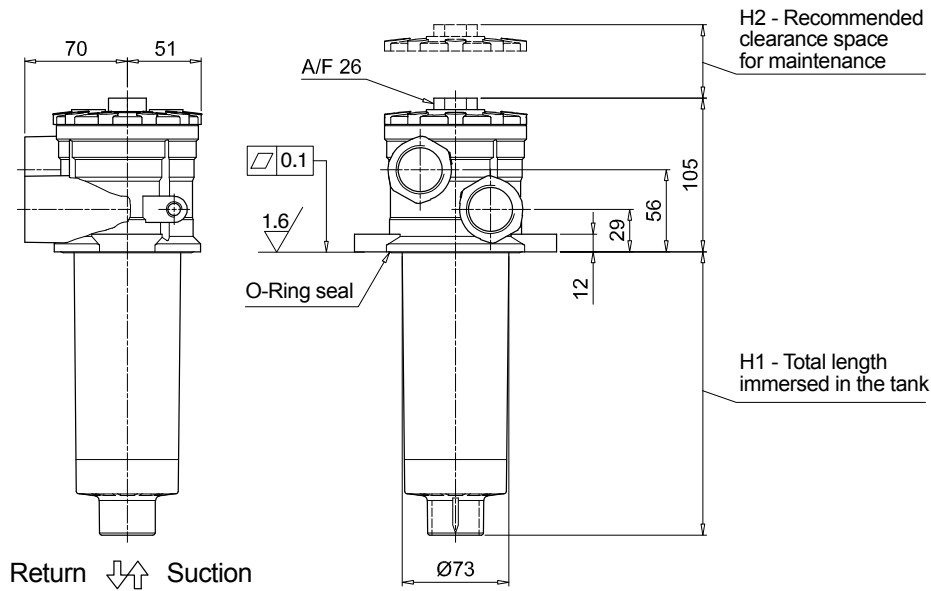
Indicators on Suction Line

VVB Axial vacuum gauge
VVS Radial vacuum gauge

VEB Electrical vacuum indicator
VLB Electrical / visual vacuum indicator

MRSX116		
Filter length	H1 [mm]	H2 [mm]
1	203	240
2	263	300

Connections	T
G1 - G2	G 1/8"
G3 - G4	1/8" NPT
G5 - G6	1/8" NPT
D1	G 1/8"
D2 - D3	1/8" NPT



MRSX MRSX165 - MRSX166

Designation & Ordering code

COMPLETE FILTER

Series and size Configuration example: **MRSX166** **2** **C** **V** **G3** **1** **A10** **S** **P01**

MRSX165 | **MRSX166** Filter featuring **MYCLEAN** Filter Element

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

Hydraulic diagram configuration - see page 285

				Bypass valve to tank		Bypass valve to OUT	
A	B	C	D	•	-	-	-
E	F	G	H	-	-	•	-
I				•	-	-	-
M				-	-	•	-

Seals and treatments

A	NBR, O-Ring on head	B	NBR, flat seal on head
V	FPM, O-Ring on head	D	FPM, flat seal on head

Connections

	IN (size 165)	IN (size 166)	Aux IN	OUT
G1	G 1 1/4"	G 1"	G 1 1/4"	G 1"
G2	1 1/4" NPT	1" NPT	1 1/4" NPT	1" NPT
G3	SAE 20 - 1 5/8" - 12 UN	SAE 16 - 1 5/16" - 12 UN	SAE 20 - 1 5/8" - 12 UN	SAE 16 - 1 5/16" - 12 UN

Aux IN connection

	MRSX 165	MRSX 166	
0	Without aux IN connection	•	-
1	With aux IN connection - see previous table	•	•

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm

A16 Inorganic microfiber 16 µm

A25 Inorganic microfiber 25 µm

Valves configuration

Mounting position	A	B	C	D	E	F	G	H	I	M
S Standard	•	•	•	•	•	•	•	•	-	-
B Tank side-wall mounting	•	•	-	-	•	•	-	-	•	•

Execution

P01 MP Filtri standard

Pxx Customized

FILTER ELEMENT

Element series and size Configuration example: **RSX165** **2** **A10** **V** **P01**

RSX165 Filter Element with **MYCLEAN** feature

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

Filtration rating (filter media)

A10 Inorganic microfiber 10 µm

A16 Inorganic microfiber 16 µm

A25 Inorganic microfiber 25 µm

Seals

A	NBR
V	FPM

Execution

P01 MP Filtri standard

Pxx Customized

CLOGGING INDICATORS

See page 303

Indicators on Return Line

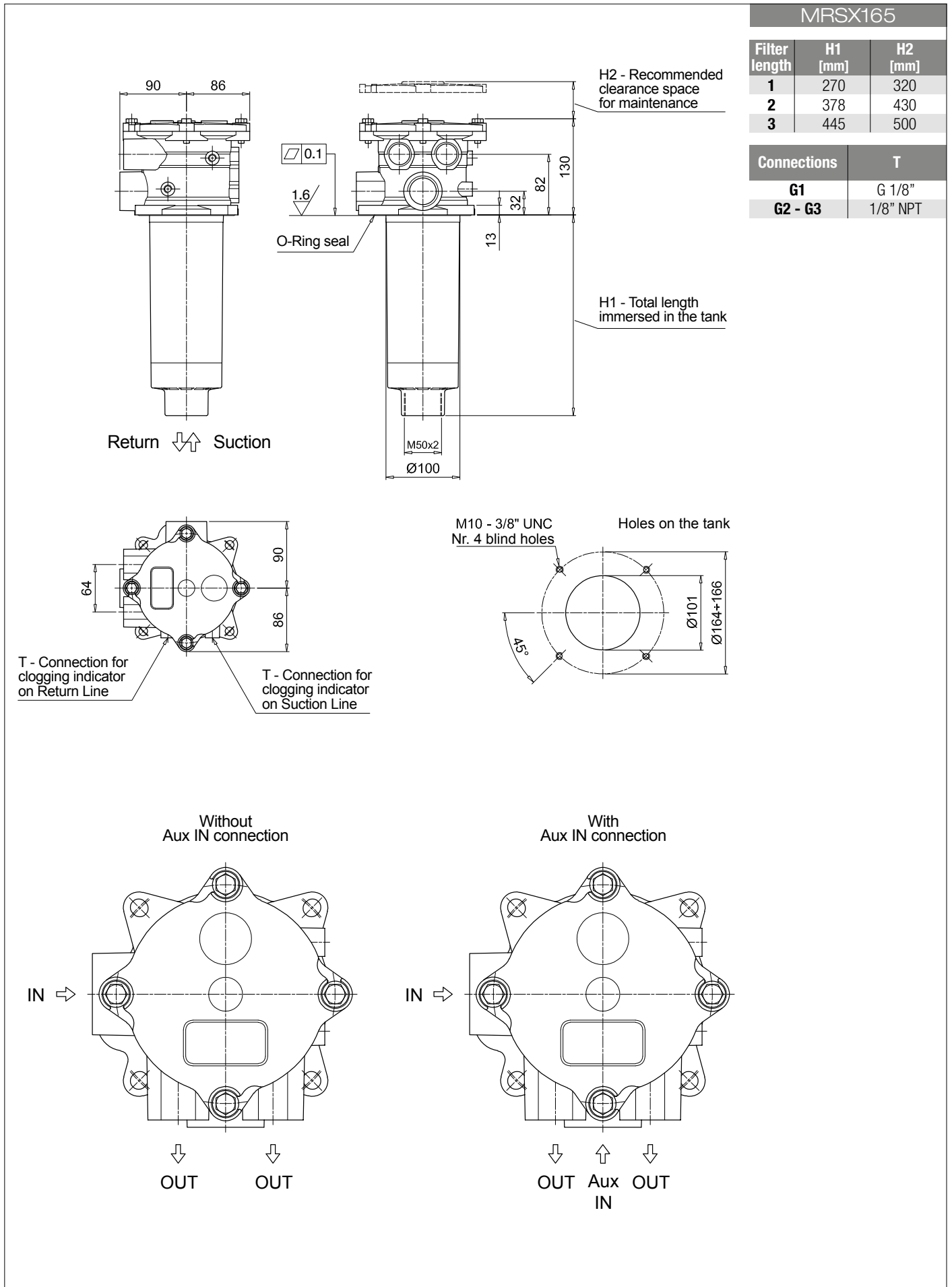
BVA	Axial pressure gauge
BVR	Radial pressure gauge
BVP	Visual pressure indicator with automatic reset
BVQ	Visual pressure indicator with manual reset

BEA	Electrical pressure indicator
BEM	Electrical pressure indicator
BET	Electrical pressure indicator
BLA	Electrical / visual pressure indicator

Indicators on Suction Line

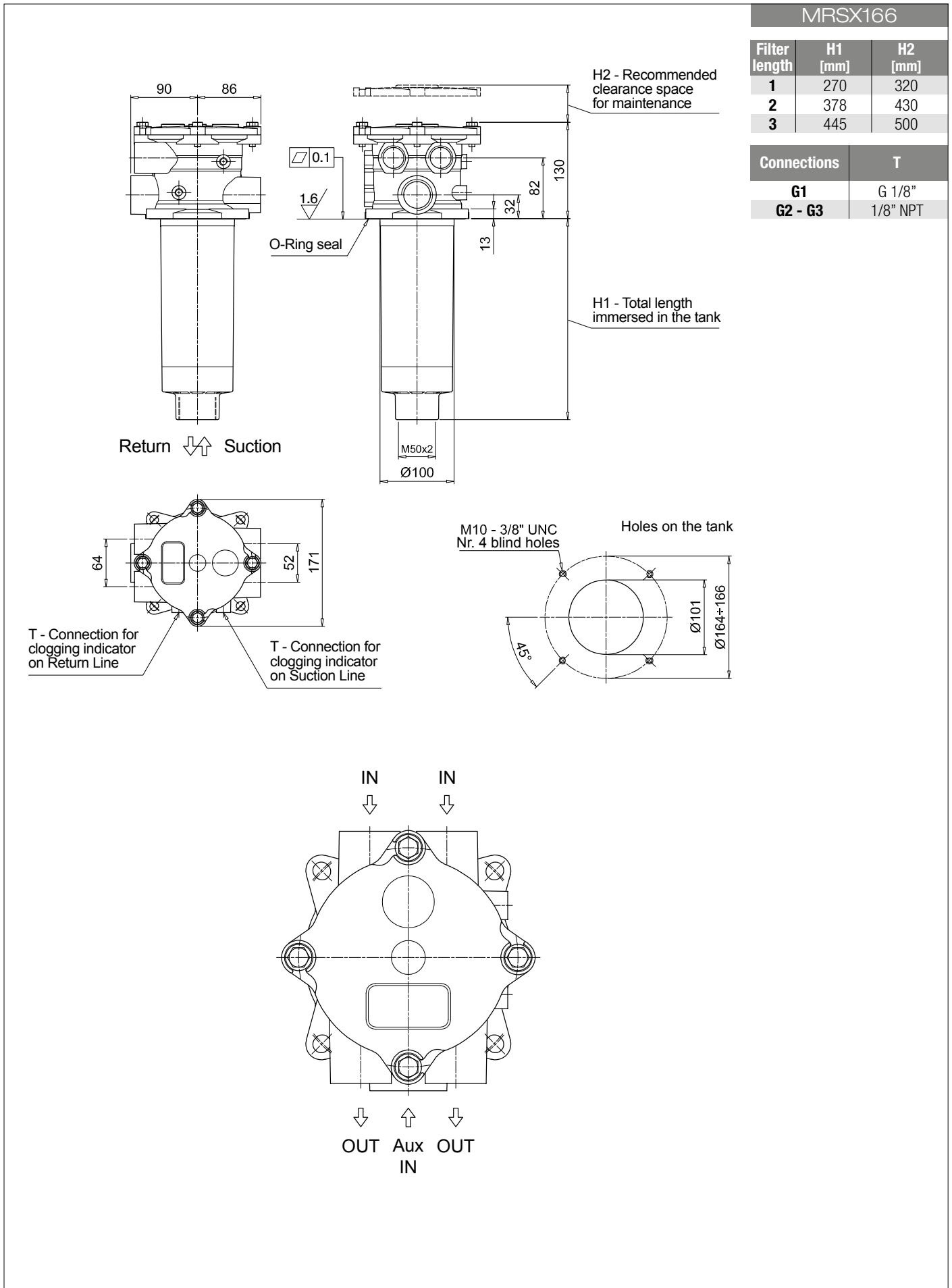
VVB	Axial vacuum gauge
VVS	Radial vacuum gauge

VEB	Electrical vacuum indicator
VLB	Electrical / visual vacuum indicator

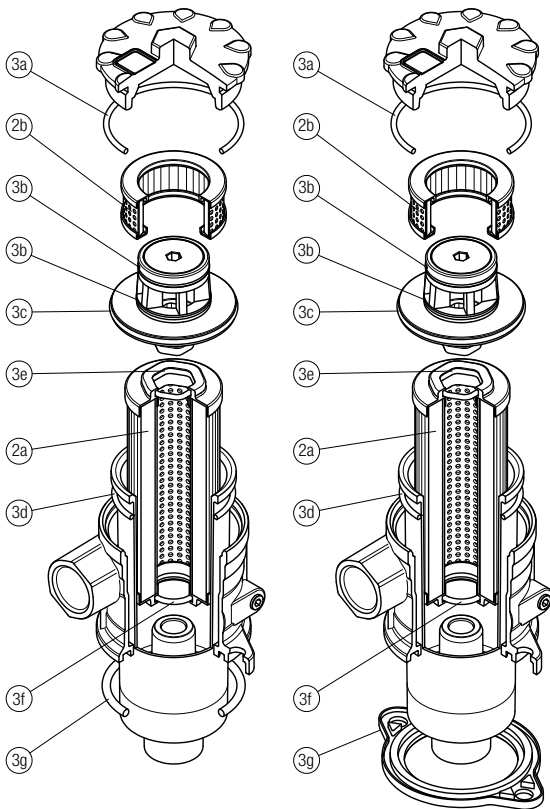


MRSX MRSX165 - MRSX166

Dimensions

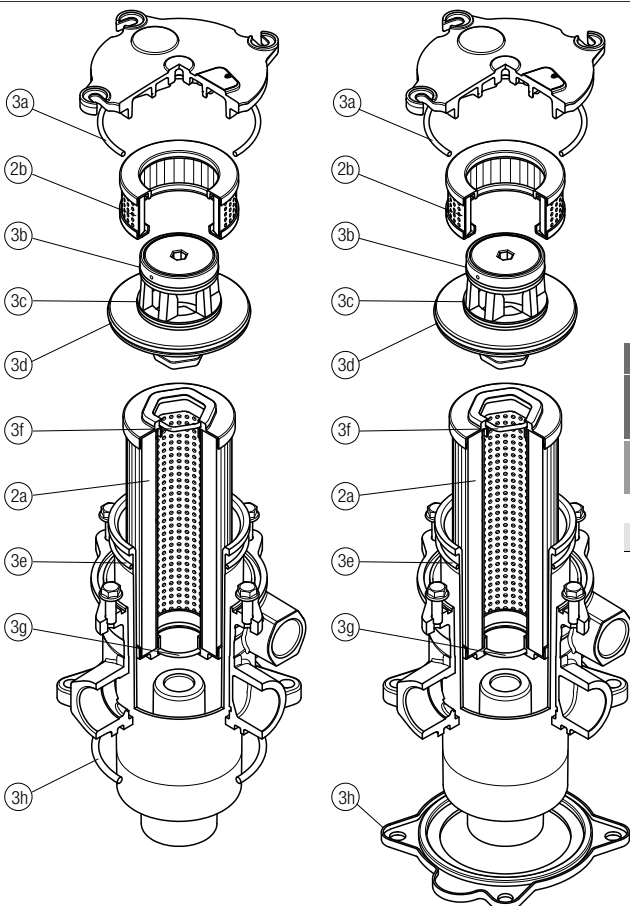


MRSX 116



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	O-RING SEAL		FLAT SEAL	
	2a	2b	Q.ty: 1 pc. 3 (3a ÷ 3g)		Q.ty: 1 pc. 3 (3a ÷ 3g)	
Filter series	Filter element	Safety filter element	Seal Kit code number		Seal Kit code number	
MRSX 116	See order table	S116M60P01	NBR	FPM	NBR	FPM
			02050617	02050619	02050618	02050620

MRSX 165 - 166



Item:	Q.ty: 1 pc.	Q.ty: 1 pc.	O-RING SEAL		FLAT SEAL	
	2a	2b	Q.ty: 1 pc. 3 (3a ÷ 3h)		Q.ty: 1 pc. 3 (3a ÷ 3h)	
Filter series	Filter element	Safety filter element	Seal Kit code number		Seal Kit code number	
MRSX 165	See order table	S165M60P01	NBR	FPM	NBR	FPM
MRSX 166			02050627	02050630	02050628	02050631
			02050627	02050630	02050629	02050632

LMP 124 series

MULTI PORT

Maximum working pressure up to 8 MPa (80 bar) - Flow rate up to 120 l/min



Description

Technical data

Return / Suction filter

In-line

Maximum working pressure up to 8 MPa (80 bar)
Flow rate up to 120 l/min

LMP124 is a range of return/suction filters for hydraulic systems with two or more circuits (both open and closed loops). They are able to provide pressurized oil cleaned by fine filtration to the feed pump of the hydrostatic systems.

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

Available features:

- Female threaded connections up to 1", for a maximum return flow rate of 120 l/min
- Fine filtration rating, to get a good cleanliness level into the reservoir
- Bypass valve to the tank, to relieve excessive pressure drop across the filter media when the return flow is enough higher than the suction flow
- Bypass valve to the suction line with additional suction filter element, to relieve excessive pressure drop across the filter media when the return flow is not enough higher than the suction flow
- De-pressurization valve, to reduce the pressure inside the filter during the maintenance operations
- Visual, electrical and electronic differential clogging indicators

Common applications:

Mobile machines with hydrostatic systems on board.
 (i.e. skid steer loaders, telehandlers, dumpers, road sweepers)

Filter housing materials

- Head: Aluminium
- Housing: Cathaphoresis - Painted steel
- Bypass valve: Brass - Aluminium

Pressure

- Test pressure: 12MPa (120 bar)
- Burst pressure: 38 MPa (380 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 80 bar (8 MPa)

Bypass valve

- Opening pressure 250 kPa (2.5 bar) ±10%
- Other opening pressures on request.

Δp element type

- Microfibre filter elements - series N - W: 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

Note

LMP124 filters are provided for vertical mounting

Weights [kg] and volumes [dm³]

Filter series	Weights [kg]				Volumes [dm ³]					
	Length	1	2	3	4	Length	1	2	3	4
LMP 124		1.70	1.90	2.20	2.70		0.75	0.81	1.11	1.53

Filter series	Length	Filter element design - N series							
		A03	A06	A10	A16	A25	M25 M60 M90	P10	P25
LMP 124	1	39	41	58	60	69	99	84	85
	2	47	53	68	69	77	99	90	91
	3	59	61	73	77	86	99	92	93
	4	70	78	84	86	93	100	94	95


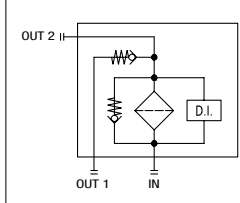
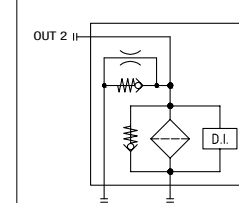
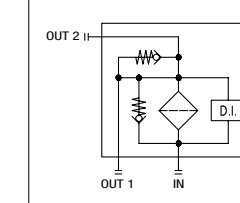
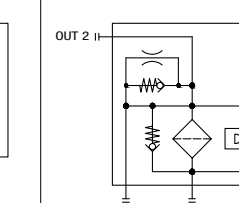

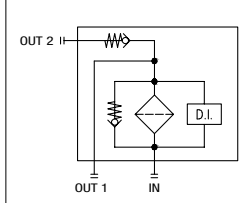
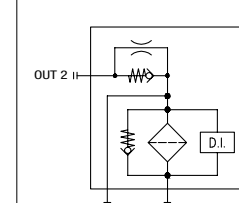
Maximum flow rate for a complete return/suction filter with a pressure drop $\Delta p = 1.2$ bar.

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.

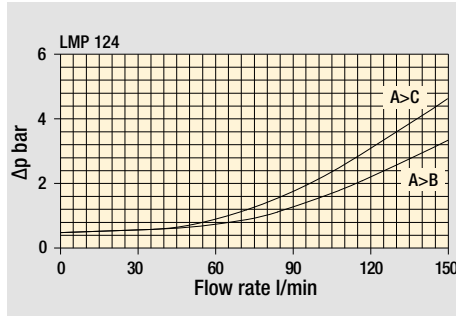
You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure. Please, contact our Sales Department for further additional information.

Hydraulic symbols - Multiport styles

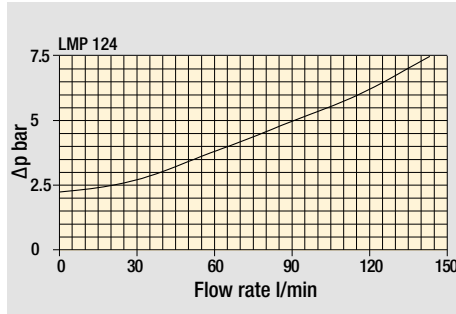
Multiport	Valves C option	Valves D option	Valves E option	Valves F option
 <p>IN - Return OUT 1 - Tank OUT 2 - Pump</p>				
 <p>IN - Return OUT 1 - Tank OUT 2 - Pump</p>				

Pressure drop

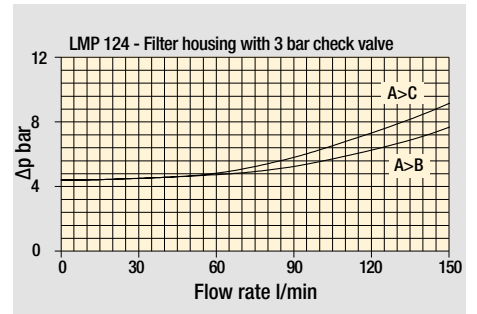
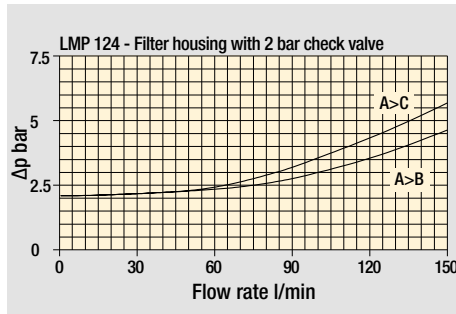
Filter housings Δp pressure drop



Bypass valve pressure drop

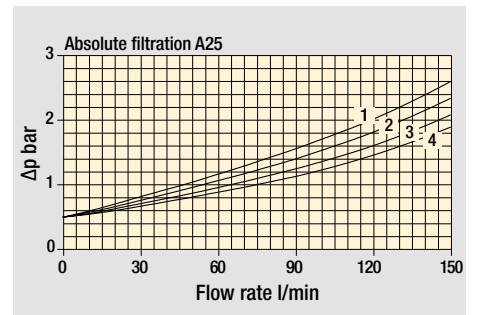
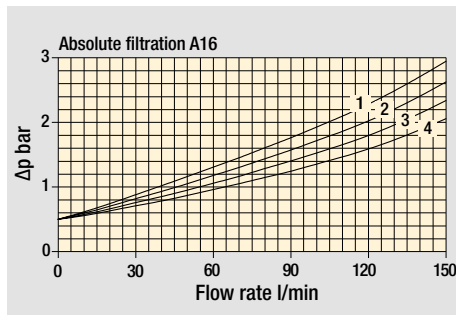
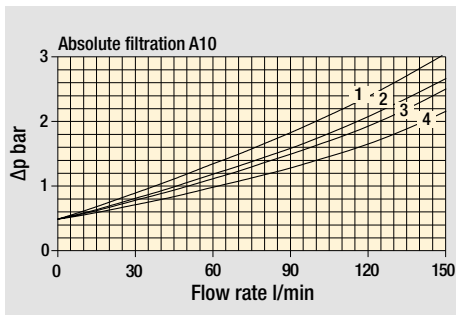


Valves

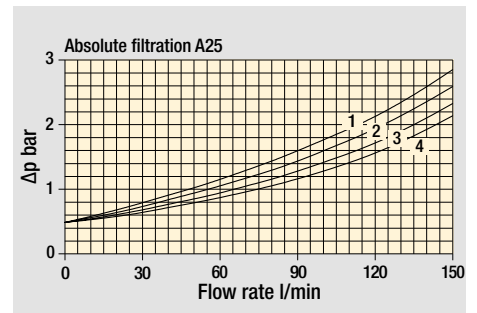
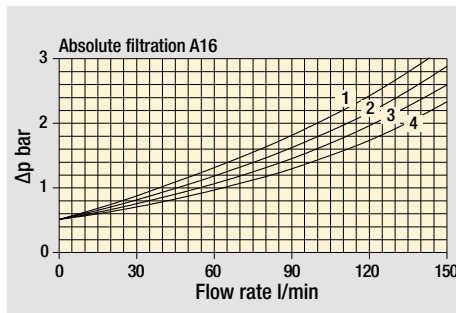
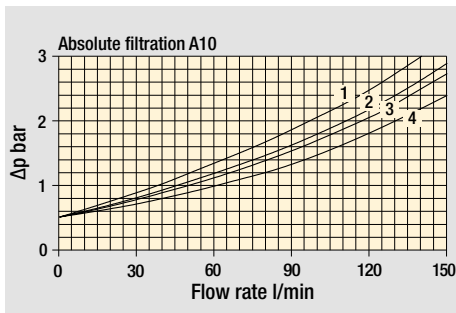


Filter length: 1 - 2 - 3 - 4

STYLE C - D - E - F



STYLE G - H



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.

Designation & Ordering code

COMPLETE FILTER

Series and size	Configuration example: LMP124 4 C A F 1 A10 N P01									
LMP124										
Filter length	1 2 3 4									
Hydraulic diagram configuration - see page 300	C D E F G H									
Seals and treatments	A NBR V FPM									
Connections	B G 1" F SAE 16 - 1 5/16" - 12 UN									
Connection for indicator	1 Without 2 With connection G 1/8" for clogging indicator 3 With connection G 1/4" for clogging indicator 4 With connection for differential indicator									
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 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 20 bar					Execution P01 MP Filtri standard Pxx Customized		

FILTER ELEMENT

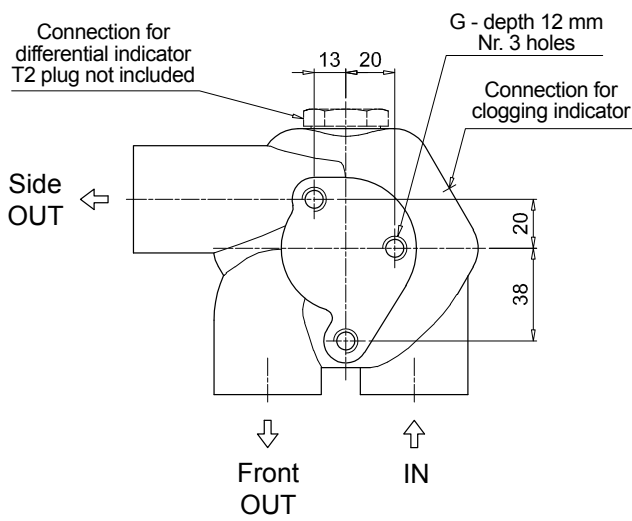
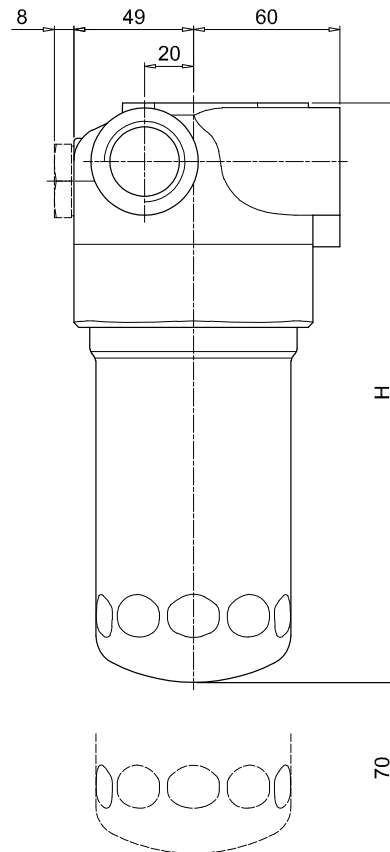
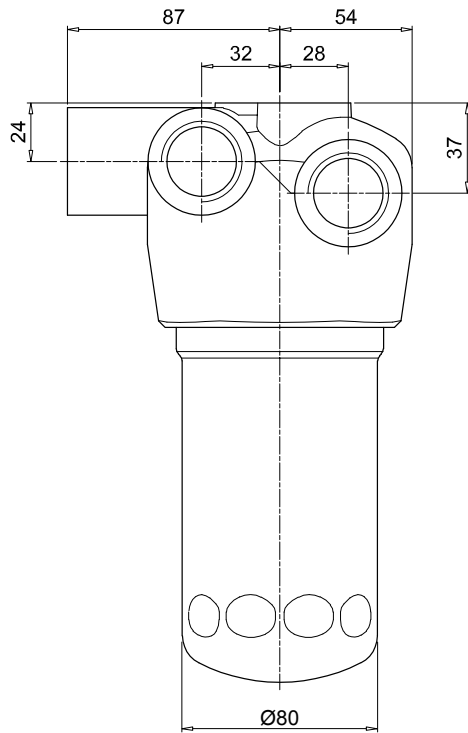
Element series and size	Configuration example: CU110 4 A10 A N P01					
CU110						
Element length	1 2 3 4					
Filtration rating (filter media)	A03 Inorganic microfiber 3 µm A06 Inorganic microfiber 6 µm A10 Inorganic microfiber 10 µm A16 Inorganic microfiber 16 µm A25 Inorganic microfiber 25 µm	M25 Wire mesh 25 µm M60 Wire mesh 60 µm M90 Wire mesh 90 µm P10 Resin impregnated paper 10 µm P25 Resin impregnated paper 25 µm				
			Seals A NBR V FPM	Element Δp N 20 bar		Execution P01 MP Filtri standard Pxx Customized

CLOGGING INDICATORS

See page 303

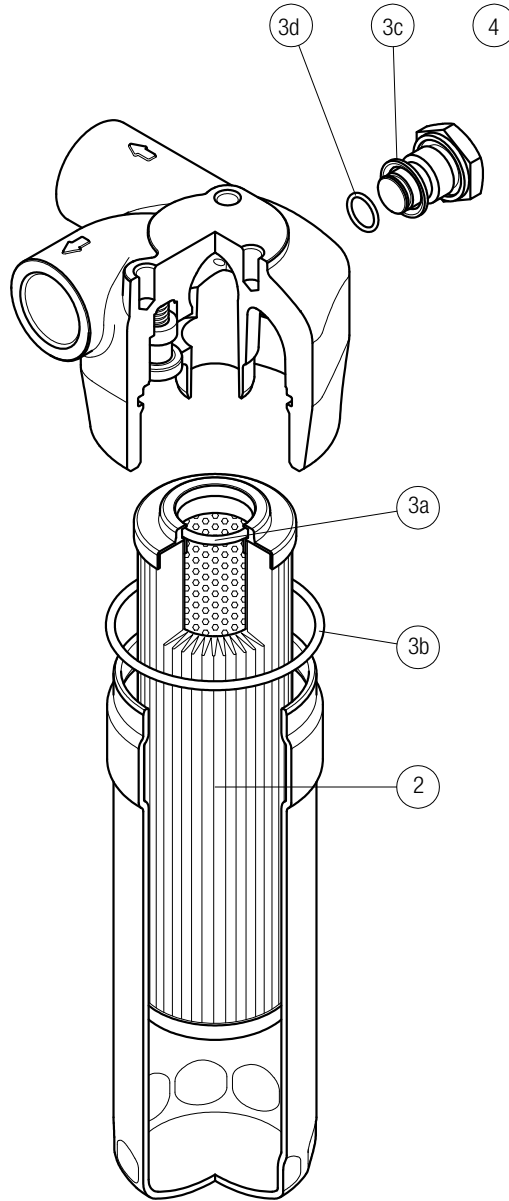
Indicators on Return Line	
BVA Axial pressure gauge	BEA Electrical pressure indicator
BVR Radial pressure gauge	BEM Electrical pressure indicator
BVP Visual pressure indicator with automatic reset	BET Electrical pressure indicator
BVQ Visual pressure indicator with manual reset	BLA Electrical / visual pressure indicator
Differential indicators	
DEA Electrical differential indicator	DTA Electronic differential indicator
DEM Electrical differential indicator	DVA Visual differential indicator
DLA Electrical / visual differential indicator	DVM Visual differential indicator
DLE Electrical / visual differential indicator	T2 Plug

LMP 124	
MULTIPORT	
Filter length	H [mm]
1	182
2	215
3	265
4	365
Connections	R
B	M10
F	3/8" UNC



Order number for spare parts

LMP 124 MULTIPOINT



Item:	Q.ty: 1 pc.		Q.ty: 1 pc.		Q.ty: 1 pc.	
Filter series	Filter element	Seal Kit code number		Indicator connection plug		
LMP 124 MULTIPOINT	See order table	NBR	FPM	NBR	FPM	
	2	3 (3a ÷ 3d)		4		
		02050478	02050479	T2H	T2V	

Clogging indicators

Introduction

Filter elements are efficient only if their Dirt Holding Capacity is fully exploited. This is achieved by using filter housings equipped with clogging indicators.

These devices trip when the clogging of the filter element causes an increase in pressure drop across the filter element.

The indicator is set to alarm before the element becomes fully clogged.

MP Filtri can supply indicators of the following designs:

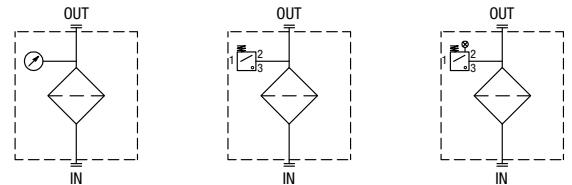
- Vacuum switches and gauges
- Pressure switches and gauges
- Differential pressure indicators

These type of devices can be provided with a visual, electrical or both signals.

Suitable indicator types

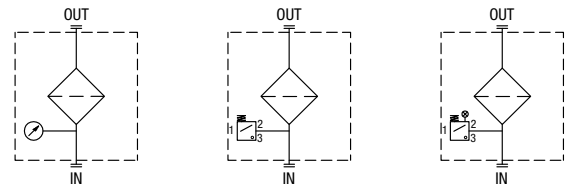
VACUUM INDICATORS

Vacuum indicators are used on the Suction line to check the efficiency of the filter element. They measure the pressure downstream of the filter element. Standard items are produced with R 1/4" EN 10226 connection. Available products with R 1/8" EN 10226 to be fitted on MPS series.



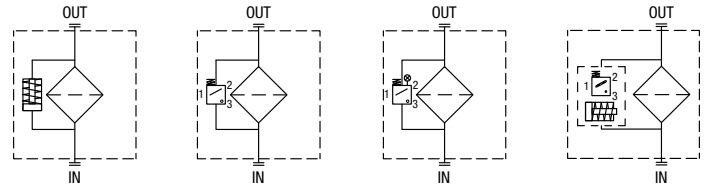
BAROMETRIC INDICATORS

Pressure indicators are used on the Return line to check the efficiency of the filter element. They measure the pressure upstream of the filter element. Standard items are produced with R 1/8" EN 10226 connection.



DIFFERENTIAL INDICATORS

Differential indicators are used on the Pressure line to check the efficiency of the filter element. They measure the pressure upstream and downstream of the filter element (differential pressure). Standard items are produced with special connection G 1/2" size. Also available in Stainless Steel models.



Quick reference guide

Filter family	Filter series	Visual indicators	Electrical indicators	Electrical / Visual indicators		
RETURN / SUCTION FILTERS	MRSX 116 - 165 - 166 Suction line	VVB16P01 VVS16P01	VEB21AA50P01	VLB21AA51P01 VLB21AA52P01 VLB21AA53P01 VLB21AA71P01		
	With bypass valve 2.5 bar	MRSX 116 - 165 - 166 Return line	BVA14P01 BVA25P01	BEA15HA50P01 BEA20HA50P01 BEM15HA41P01 BEM20HA41P01	BET20HF10P01 BET20HF30P01 BET20HF50P01 BET25HF10P01 BET25HF30P01 BET25HF50P01	
			BVR14P01 BVR25P01			BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01 BLA20HA51P01 BLA20HA52P01 BLA20HA53P01 BLA20HA71P01
			BVP15HP01 BVP20HP01			
			BVQ15HP01 BVQ20HP01			
	With bypass valve 2.5 bar	LMP 124 MULTIPORT	BVA14P01 BVA25P01	BEA15HA50P01 BEA20HA50P01	BLA15HA51P01 BLA15HA52P01 BLA15HA53P01 BLA15HA71P01 BLA20HA51P01 BLA20HA52P01 BLA20HA53P01 BLA20HA71P01	
			BVR14P01 BVR25P01	BEM15HA41P01 BEM20HA41P01		DEA20xA50P01
			BVP15HP01 BVP20HP01	DVA20xP01		DEM20XX10P01 DEM20XX20P01 DEM20XX30P01 DEM20XX35P01
			BVQ15HP01 BVQ20HP01	DVM20xP01		DTA20xF70P01

VACUUM INDICATORS

Dimensions

VE*50	
Electrical Vacuum Indicator	
R	Ordering code
EN 10226 - R1/4"	VE A 21 A A 50 P01
EN 10226 - R1/8"	VE B 21 A A 50 P01

A/F 27
Max tightening torque:
R 1/4: **25 N·m**
R 1/8: **6.5 N·m**

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black polyamide
- 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: I M1 Ex ia I Ma
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 - R1/4"	VL A 21 A A xx P01
EN 10226 - R1/8"	VL B 21 A A xx P01

A/F 27
Max tightening torque:
R 1/4: **25 N·m**
R 1/8: **6.5 N·m**

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Transparent polyamide
- Contacts: Brass - Polyamide
- 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: 51 52 53
- 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	Indicator code
EN 10226 - R1/4"	VL A 21 A A 71 P01
EN 10226 - R1/8"	VL B 21 A A 71 P01

A/F 27
Max tightening torque:
R 1/4: **25 N·m**
R 1/8: **6.5 N·m**

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Black polyamide
- 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

VVA - VVB	
Axial Vacuum Gauge	
R	Ordering code
EN 10226 - R1/4"	VV A 16 P01
EN 10226 - R1/8"	VV B 16 P01

A/F 27
Max tightening torque:
R 1/4: **25 N·m**
R 1/8: **6.5 N·m**

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

VVR - VVS		
Radial Vacuum Gauge		
R	A/F	Ordering code
EN 10226 - R1/4"	14	VV R 16 P01
EN 10226 - R1/8"	11	VV S 16 P01

A/F
Max tightening torque:
R 1/4: **25 N·m**
R 1/8: **6.5 N·m**

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									
Series		Configuration example 1:	VE	A	21	A	A	50	P01
VE	Electrical vacuum indicator	Configuration example 2:	VL	B	21	A	A	71	P01
VL	Electrical/Visual vacuum indicator	Configuration example 3:	VV	R	16				P01
VV	Vacuum gauge								
Type VE - VL		Type VV							
A	Connection EN 10226 - R1/4"	A	Axial connection EN 10226 - R1/4"						
B	Connection EN 10226 - R1/8"	B	Axial connection EN 10226 - R1/8"						
		R	Radial connection EN 10226 - R1/4"						
		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

BAROMETRIC INDICATORS

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>A/F 27 Max tightening torque: 3 N·m (on polyamide filter cover) 6.5 N·m (on aluminium filter)</p> <p>EN 10226 - R1/8"</p>	
<p>Hydraulic symbol</p> <p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - 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 - Available ATEX product: I M1 Ex ia I Ma II 1GD Ex ia IIC TX Ga Ex ia IIIC TX °C Da - CE certification 	



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>A/F 27 Max tightening torque: 3 N·m (on polyamide filter cover) 6.5 N·m (on aluminium filter)</p> <p>EN 10226 - R1/8"</p>	
<p>Hydraulic symbol</p> <p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - 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 - CE certification On request this indicator can be provided with main connectors in use for wirings. 	

BET*10	
Electrical Pressure Indicator	
Settings	Ordering code
2.0 bar ±10%	BET 20 H F 10 P01
2.5 bar ±10%	BET 25 H F 10 P01
<p>A/F 27 Max tightening torque: 3 N·m (on polyamide filter cover) 6.5 N·m (on aluminium filter)</p> <p>EN 10226 - R1/8"</p>	
<p>Hydraulic symbol</p> <p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR <p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 10 bar - Proof pressure: 15 bar - Working temperature: From -25 °C to +100 °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: AMP Superseal series 1.5 - Resistive load: 0.5 A / 48 Vdc - Thermostat condition: Open up to 30 °C - CE certification 	

BET*30	
Electrical Pressure Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	BET 20 H F 30 P01
2.5 bar $\pm 10\%$	BET 25 H F 30 P01

Hydraulic symbol

Electrical symbol

Materials

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

Technical data

- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +100 °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: Deutsch DT-04-2-P
- Resistive load: 0.5 A / 48 Vdc
- Thermostat condition: Open up to 30 °C
- CE certification

BET*50	
Electrical Pressure Indicator	
Settings	Ordering code
2.0 bar $\pm 10\%$	BET 20 H F 50 P01
2.5 bar $\pm 10\%$	BET 25 H F 50 P01

Hydraulic symbol

Electrical symbol

Materials

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

Technical data

- Max working pressure: 10 bar
- Proof pressure: 15 bar
- Working temperature: From -25 °C to +100 °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: 0.5 A / 48 Vdc
- Thermostat condition: Open up to 30 °C
- CE certification

BL*51 - BL*52 - BL*53	
Electrical/Visual Pressure Indicator	
Settings	Ordering code
1.5 bar $\pm 10\%$	BL A 15 H A xx P01
2.0 bar $\pm 10\%$	BL A 20 H A xx P01

Hydraulic symbol

Electrical symbol

Materials

- Body: Brass
- Base: Transparent polyamide
- Contacts: Silver
- Seal: HNBR

Technical data

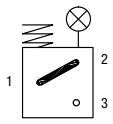
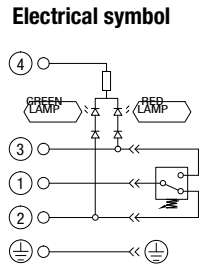
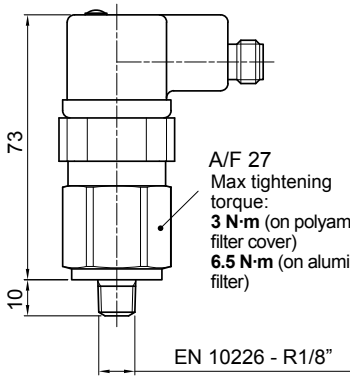
- Max working pressure: 40 bar
- Proof pressure: 60 bar
- Working temperature: From -25 °C to +80 °C
- Compatibility with fluids: Mineral oils, Synthetic fluids
HFA, HFB, HFC according to ISO 2943
- Degree of protection: IP65 according to EN 60529

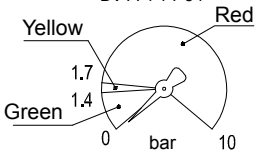
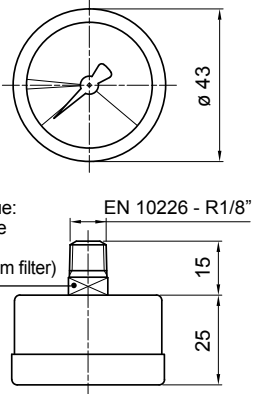
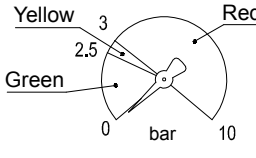
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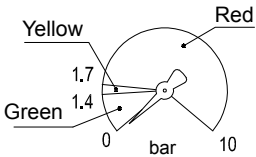
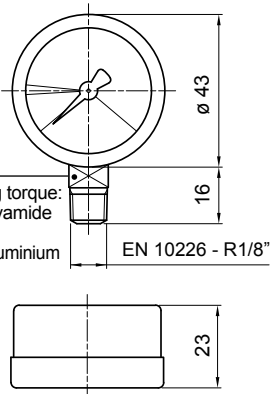
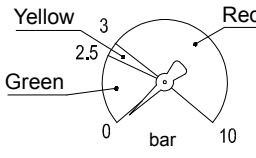
- Electrical connection: EN 175301-803
- Type: 51 52 53
- Lamps: 24 Vdc 110 Vdc 230 Vac
- Resistive load: 1 A / 24 Vdc 1 A / 110 Vdc 1 A / 230 Vac

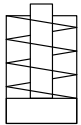
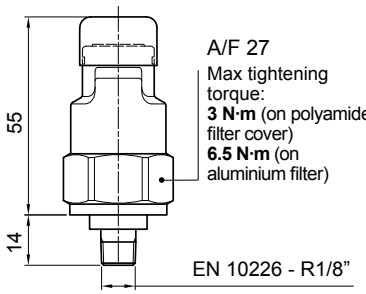
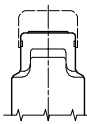
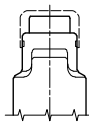
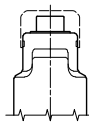
BAROMETRIC INDICATORS

Dimensions

BL*71		Hydraulic symbol	Materials
Electrical/Visual Pressure Indicator			
Settings	Ordering code		Brass Black polyamide Silver HNBR
1.5 bar ±10%	BL A 15 HA 71 P01		
2.0 bar ±10%	BL A 20 HA 71 P01		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
 <p>A/F 27 Max tightening torque: 3 N·m (on polyamide filter cover) 6.5 N·m (on aluminium filter)</p>			

BVA		Hydraulic symbol	Materials
Axial Pressure Gauge			
Settings	Ordering code		
1.4 bar ±10%	BV A 14 P01	 <p>Dial scale BV A 14 P01</p>	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
2.5 bar ±10%	BV A 25 P01		
 <p>A/F 11 Max tightening torque: 3 N·m (on polyamide filter cover) 6.5 N·m (on aluminium filter)</p>		 <p>Dial scale BV A 25 P01</p>	

BVR		Hydraulic symbol	Materials
Radial Pressure Gauge			
Settings	Ordering code		
1.4 bar ±10%	BV R 14 P01	 <p>Dial scale BV R 14 P01</p>	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
2.5 bar ±10%	BV R 25 P01		
 <p>A/F 11 Max tightening torque: 3 N·m (on polyamide filter cover) 6.5 N·m (on aluminium filter)</p>		 <p>Dial scale BV R 25 P01</p>	

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	A/F 27 Max tightening torque: 3 N·m (on polyamide filter cover) 6.5 N·m (on aluminium filter)		
	BV Q 20 H P01			
		Signals		
		 Absence of pressure (no indicator)	 Presence of pressure (green button rises gradually)	 Clogged filter element (red button risen)

DESIGNATION & ORDERING CODE

Series	Configuration example 1:						
BE Electrical pressure indicator	BE	M	15	H	A	41	P01
BL Electrical/Visual pressure indicator	BL	A	20	H	A	71	P01
BV Visual pressure indicator	BV	R	14				P01
	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
T With thermal switch	•	-	P Visual indicator with automatic reset
			Q Visual indicator with manual reset

Pressure setting	BEA-BEM	BET	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	BET	BLA	BV
A Without	•	-	•	-
F With	-	•	-	-

Electrical connections	BEA	BEM	BET	BL	BV
10 Connection AMP Superseal series 1.5	-	-	•	-	-
30 Connection Deutsch DT-04-2-P	-	-	•	-	-
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

DIFFERENTIAL INDICATORS

Dimensions

DEA*50	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DE A 20 x A 50 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP66 according to EN 60529 IP69K according to ISO 20653 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: EN 175301-803 - Resistive load: 0.2 A / 115 Vdc 	

DEM*10	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DE M 20 xx 10 P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP66 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 / 115 Vdc - Switching type: Normally open contacts (NC on request) - Thermal lockout: Normally open up to 30 °C (option "F") 	

DEM*20	
Electrical Differential Indicator	
Settings 2.0 bar ±10%	Ordering code DEM20xx20P01
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP66 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: AMP Time junior - Resistive load: 0.2 A / 115 Vdc - Switching type: Normally open contacts (NC on request) - Thermal lockout: Normally open up to 30 °C (option "F") 	

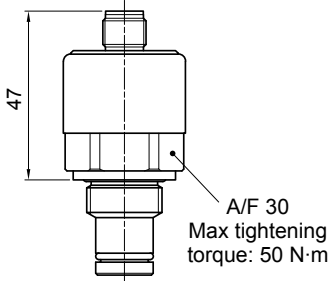
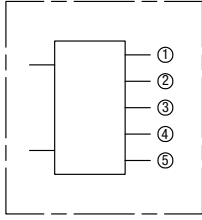
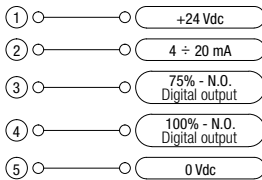
DIFFERENTIAL INDICATORS

Dimensions

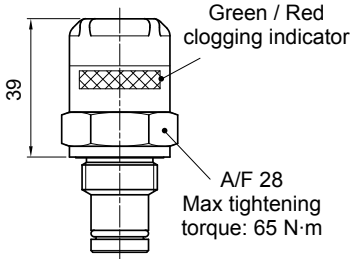
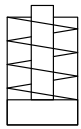
DLA*71	
Electrical/Visual Differential Indicator	
Settings 2.0 bar \pm 10%	Ordering code DLA 20 x A 71 P01
<p>A/F 30 Max tightening torque: 65 N·m</p>	
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP65 according to EN 60529 IP69K according to ISO 20653 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connection: IEC 61076-2-101 D (M12) - Lamps: 24 Vdc - Resistive load: 0.4 A / 24 Vdc 	

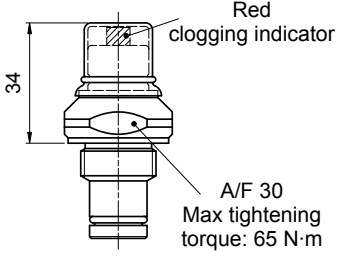
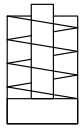
DLE*A50	
Electrical/Visual Differential Indicator	
Settings 2.0 bar \pm 10%	Ordering code DLE 20 x A 50 P01
<p>A/F 32 Max tightening torque: 95 N·m</p>	
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connections: EN 175301-803 - Resistive load: 5 A / 250 Vac - Available the connector with lamps 	

DLE*F50	
Electrical/Visual Differential Indicator	
Settings 2.0 bar \pm 10%	Ordering code DLE 20 x F 50 P01
<p>A/F 32 Max tightening torque: 95 N·m</p>	
<p>Hydraulic symbol</p>	
<p>Electrical symbol</p> <p>Thermal lockout</p>	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Base: Black polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP65 according to EN 60529 	
<p>Electrical data</p> <ul style="list-style-type: none"> - Electrical connections: EN 175301-803 - Resistive load: 5 A / 250 Vac - Thermal lockout setting: +30 °C 	

DTA*70	
Electronic Differential Indicator	
Settings	Ordering code
2.0 bar ±10%	DT A 20 x x 70 P01
	
<p>Hydraulic symbol</p> 	
<p>Electrical symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 bar - 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: IEC 61076-2-101 D (M12) - Power supply: 24 Vdc - Analogue output: From 4 to 20 mA - Thermal lockout: 30 °C (all output signals stalled up to 30 °C) 	



DVA	
Visual Differential Indicator	
Settings	Ordering code
2.0 bar ±10%	DV A 20 x P01
	
<p>Hydraulic symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Reset: Automatic reset - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP65 according to EN 60529 	

DVM	
Visual Differential Indicator	
Settings	Ordering code
2.0 bar ±10%	DV M 20 x P01
	
<p>Hydraulic symbol</p> 	
<p>Materials</p> <ul style="list-style-type: none"> - Body: Brass - Internal parts: Brass - Polyamide - Contacts: Silver - Seal: HNBR - FPM 	
<p>Technical data</p> <ul style="list-style-type: none"> - Reset: Manual reset - Max working pressure: 420 bar - Proof pressure: 630 bar - Burst pressure: 1260 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: IP65 according to EN 60529 	

DIFFERENTIAL INDICATORS

Dimensions

T2	
Indicator plug	
Seal	Ordering code
HNBR	T2 H
FPM	T2 V

A/F 30
Max tightening torque: 65 N·m

Materials

- Body: Phosphatized steel
- Seal: HNBR / FPM

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATORS

Series	Configuration example 1:						
DE Electrical differential indicator	DE	M	20	H	F	50	P01
DL Electrical/Visual differential indicator	DL	E	20	V	A	71	P01
DT Electronic differential indicator	DT	A	20	H	F	70	P01
DV Visual differential indicator	DV	M	20	V			P01

Type	DE	DL	DT	DV
A Standard type	•	•	•	A With automatic reset
M With wired electrical connection	•	-	-	M With manual reset
E For high power supply	-	•	-	

Pressure setting	20
20 2.0 bar	

Seals	H	V
H HNBR		
V FPM		

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

Electrical connections	DEA	DEM	DLA	DLE	DT	DV
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

DESIGNATION & ORDERING CODE - DIFFERENTIAL INDICATOR PLUG

Series	Configuration example	
T2 Indicator plug	T2	H

Seals	H	V
H HNBR		
V FPM		

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