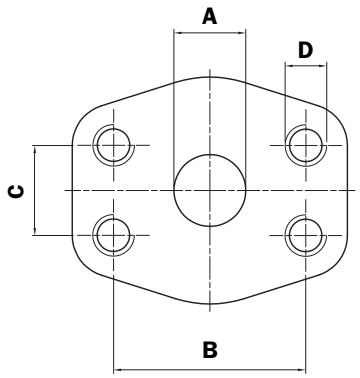
Sizes - Connections DN - SAE

FLANGE SAE 3000 PSI



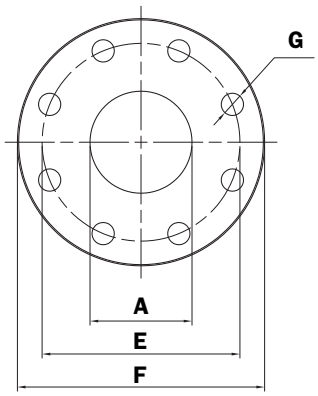
Connection to 3000 psi SAE flange

Dimension	1" SAE 3000 PSI **M**	1" SAE 3000 PSI **UNC**	1 1/4" SAE 3000 PSI **M**	1 1/4" SAE 3000 PSI **UNC**	1 1/2" SAE 3000 PSI **M**	1 1/2" SAE 3000 PSI **UNC**	2" SAE 3000 PSI **M**	2" SAE 3000 PSI **UNC**
A	25	25	32	32	38	38	51	51
B	52,4	52,4	58,7	58,7	70	70	77,8	77,8
C	26,2	26,2	30,2	30,2	35,7	35,7	42,9	42,9
D	M10	3/8" UNC	M10	7/16"UNC	M12	1/2" UNC	M12	1/2" UNC

Connection to 3000 psi SAE flange

Dimension	2 1/2" SAE 3000 PSI **M**	2 1/2" SAE 3000 PSI **UNC**	3" SAE 3000 PSI **M**	3" SAE 3000 PSI **UNC**	3 1/2" SAE 3000 PSI **M**	3 1/2" SAE 3000 PSI **UNC**	4" SAE 3000 PSI **M**	4" SAE 3000 PSI **UNC**
A	63	63	73	73	89	89	99	99
B	88,9	88,9	106,4	106,4	120,7	120,7	130,2	130,2
C	50,8	50,8	62	62	70	70	77,8	77,8
D	M12	1/2" UNC	M16	5/8" UNC	M16	5/8" UNC	M16	5/8" UNC

FLANGE DN 100 PN 10/16



Connection Flange IN-OUT	DN 100 PN 16
A	99
E	180
F	220
G	18

SAE flange connections available on Return filters

Filter Type	Connections 1" SAE 3000	1 1/4" SAE 3000	1 1/2" SAE 3000	2" SAE 3000	2 1/2" SAE 3000	3" SAE 3000	3 1/2" SAE 3000	4" SAE 3000	DN 100 PN 10/16
MPF184			X						
MPF194			X						
MPF450				X					
MPF451				X					
MPF750				X					
MPH250		X	X						
MPH630				X	X				
MPH660						X		X	
MPH850						X		X	X
FRI100	X								
FRI250			X						
FRI255			X						
FRI630					X				
FRI850							X		
RF2250			X						

Filter element

Element description

M - Wire Mesh	Δp 10 bar
P - Paper	Δp 10 bar
A - Microfibre	Δp 10 bar

Characteristics of filter elements with nominal filtration, M series

For filter elements in wire mesh, filtration degree is defined as the maximum diameter of a sphere corresponding to the mesh size, in microns.

Characteristics of filter elements with nominal filtration, P series

For filter element in cellulose, filtration efficiency expressed in micron is to be construed as nominal $\beta_{X©} > 2$.

Characteristics of filter elements with absolute filtration, A series

For filter element in microfibre, filtration degree is defined by the test bench MULTIPASS ISO 16889.

Reference standards

All filter elements comply with the following **ISO** standards.

ISO	**2941**	- Collapse and burst resistance
ISO	**2942**	- Bubble point test resistance.
ISO	**2943**	- Compatibility with fluids.
ISO	**3723**	- Resistance to axial deformation.
ISO	**3724**	- Fatigue test with flow.
ISO	**3968**	- Pressure drop.
ISO	**16889**	- Filtration efficiency by means of Multipass.

N.B. P series cellulose cartridges are compatible only with mineral oils in according to ISO 2943 - 4.

Multipass test in compliance new ISO 16889
Contaminant ISO MTD

Filtration	$\beta_{X©} \geq 1000$
Filter element	
A01	<4
A03	5
A06	7
A10	10
A16	15
A25	20

International standards for fluid contamination control

Components	**Recommended filtrations**								
Servo valves			●	●	●				
Proportional Valves				●	●	●			
Variable displacement pumps.					●	●	●		
Cartridge valves						●	●	●	
Piston pumps						●	●	●	
Vane pumps							●	●	●
Pressure - flow rate control valves							●	●	●
Solenoid valves							●	●	●
ISO code	12/10/7	13/11/8	14/12/9	15/13/10	16/14/11	17/15/12	18/16/13	19/17/14	20/18/15
NAS code	1	2	3	4	5	6	7	8	9
Absolute filtration recommended	$\beta_{5©} \geq 1000$				$\beta_{7©} \geq 1000$		$\beta_{10©} \geq 1000$		$\beta_{20©} \geq 1000$

Filter element area in wire mesh

Element for filter: MPF and MPT

	Length			
Type	**1**	**2**	**3**	**4**
MF 020	496	837	912	-
MF 030	336	-	-	-
MF 100	493	781	1286	1933
MF 180	2496	5342	-	-
MF 190	-	5342	-	-
MF 400	2701	3885	4713	-
MF 750	8059	-	-	-
	Values expressed in **cm²**			

Element for filter: MPH and MPI

	Length				
Type	**1**	**2**	**3**	**4**	**5**
MR 100	710	1040	1420	2260	2950
MR 250	1197	1637	2253	4048	-
MR 630	2308	3204	4324	5309	8647
MR 850	7368	12287	18538	24574	-
	Values expressed in **cm²**				

Element for filter: FRI and RF2

Type	**-**
CU 025	336
CU 040	493
CU 100	781
CU 250	2496
CU 630	4713
CU 850	11227
	Values expressed in **cm²**

Filter Sizing

Correct sizing of the filter must be based on a variable pressure drop depending on the application:

- return filter Δp from 0.4 to 0.6 bar

The pressure drop calculation is performed by adding together the value for the housing and the value for the filter element.

The pressure drop in 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 value is proportional to viscosity mm²/s, the Y values in the catalogue are referred to viscosity of 30 mm²/s.

Sizing data for single cartridge, head at top

Δp Tot.
Δpc Filter housing
Δpe Filter element
Y Multiplication factor (see below)
Q l/min = flow rate
V1 = reference viscosity 30 mm²/s (cSt)
V2 = operating viscosity in mm²/s (cSt)
Δp Tot. = Δpc + Δpe
Δpe = Y : 1000 x Q x (V2/V1)

Multiplication factor "Y" for definition of the pressure drop of filter elements.

Reference viscosity 30 mm²/s

Filter Element	Absolute Filtration H Series					Nominal Filtration N Series		Nominal Filtration N Series
Type	**A 0 3**	**A 0 6**	**A 1 0**	**A 1 6**	**A 2 5**	**P 1 0**	**P 2 5**	**M25 - M60 - M90**
MF 020 1	74,00	50,08	20,00	16,00	9,000	6,431	5,512	4,400
2	29,20	24,12	8,000	7,222	5,000	3,325	2,850	2,000
3	22,00	19,00	6,555	5,333	4,333	1,680	1,440	1,300
MF 030 1	74,00	50,80	20,00	16,00	9,000	6,431	5,512	3,400
MF 100 1	28,20	24,40	8,666	8,166	6,875	4,620	3,960	1,250
2	17,33	12,50	6,857	5,700	4,000	3,045	2,465	1,100
3	10,25	9,000	3,650	3,333	2,500	1,633	1,322	0,960
4	6,100	5,400	2,300	2,200	2,000	1,190	0,963	0,820
MF 180 1	3,666	3,050	1,640	1,560	1,236	1,177	1,064	0,255
2	1,685	1,371	0,676	0,542	0,509	0,431	0,390	0,120
MF 190 2	1,685	1,371	0,595	0,485	0,439	0,347	0,314	0,110
MF 400 1	3,200	2,750	1,394	1,326	1,055	0,956	0,865	0,215
2	2,000	1,867	0,875	0,850	0,550	0,494	0,447	0,130
3	1,900	1,600	0,625	0,512	0,489	0,389	0,352	0,110
MF 750 1	1,083	0,843	0,486	0,357	0,257	0,210	0,190	0,060

Filter Element	Absolute Filtration					Nominal Filtration		Nominal Filtration
Type	**A 0 3**	**A 0 6**	**A 1 0**	**A 1 6**	**A 2 5**	**P 1 0**	**P 2 5**	**M25 - M60 - M90**
MR 100 1	19,00	17,00	6,900	6,300	4,600	2,940	2,520	1,600
2	11,70	10,80	4,400	4,300	3,000	2,940	2,520	1,371
3	7,800	6,870	3,700	3,100	2,700	2,142	1,836	1,343
4	5,500	4,970	2,600	2,400	2,180	1,715	1,470	1,343
5	4,200	3,840	2,360	2,150	1,900	1,600	1,374	1,343
MR 250 1	5,350	4,850	2,322	1,920	1,500	1,380	1,200	0,154
2	4,000	3,280	1,440	1,100	1,070	0,960	0,830	0,134
3	2,600	2,200	1,080	1,000	0,861	0,768	0,640	0,124
4	1,840	1,560	0,680	0,560	0,440	0,370	0,285	0,1055
MR 630 1	3,100	2,475	1,320	1,140	0,916	0,830	0,730	0,088
2	2,060	1,920	0,820	0,760	0,380	0,333	0,269	0,080
3	1,480	1,300	0,600	0,560	0,260	0,221	0,170	0,078
4	1,300	1,200	0,480	0,400	0,245	0,210	0,160	0,074
5	0,740	0,650	0,300	0,280	0,130	0,101	0,080	0,039
MR 850 1	0,600	0,427	0,342	0,250	0,134	0,118	0,090	0,030
2	0,368	0,261	0,225	0,212	0,109	0,084	0,065	0,025
3	0,269	0,182	0,169	0,166	0,052	0,043	0,037	0,023
4	0,228	0,155	0,126	0,119	0,041	0,033	0,025	0,015
CU 025	78,00	48,00	28,00	24,00	9,330	9,333	8,510	1,250
CU 040	25,88	20,88	10,44	10,00	3,775	3,775	3,300	1,250
CU 100	15,20	14,53	5,142	4,952	2,000	2,000	0,171	1,100
CU 250	3,250	2,550	1,550	1,350	0,714	0,714	0,591	0,255
CU 630	1,960	1,680	0,846	0,720	0,420	0,420	0,360	0,090
CU 850	1,058	0,842	0,417	0,333	0,167	0,167	0,133	0,040

Calculation examples with HLP Mineral oil
Variation in viscosity

Data:
Filter with in-line connections
Pressure = 10 bar
Flow rate = 120 l/min
Viscosity = 46 mm^2/s (cSt)
Density = 0.86 kg/dm^3
Filtration = 25 μ absolute
With bypass valve

Filter type - MPT110.4 (see housings pressure drop graphs)

Practical example

Q = 120 l/min
V_2 = 46 mm^2/s (cSt)
Pmax = 10 bar
Filtration = 25 μ absolute
Δp Tot. max = **0,5 bar** (max. recommended value)
Filter element series H, Δp max 10 bar
Δpc = 0,03 bar (* see diagram)
Δpe = (2.0 : 1000) x 120 x (46/30) = 0.37 bar
Δp Tot. = 0.03 + 0.37 = 0.4 bar

Sized filter type:
MPT 110 4 C A G3 2 A25 E P01

Filter housings Δp pressure drop

The curves are plotted utilising mineral oil with density of 0.86 kg/dm^3 to ISO 3968.

Δp varies proportionally with density.

MPT 110 - Length 3 - 4