

DUPLEX FILTERS

for LUBE, HYDRAULIC, CONTROL and FUEL OIL
SERIES ADN & D6P

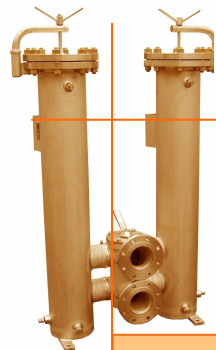
For more than twenty years, MF Filter has been a leading supplier of lube oil filters and elements of the Oil & Gas and Power Generation industry. Our products have been designed with the purpose to satisfy the elevated standards of quality required by such applications.

The constant research of new solutions and the continuous scanning of our fabrication processes guarantee our products to be always to the state-of-the-art and able to offer the best quality-price level available on the market.

Features, performance and purchasing codes of our complete STANDARD Duplex series are below described.

COSTUMIZED CONSTRUCTION ARE AVAILABLE ON REQUEST.





SIX WAY VALVE

All six way valves, mounted on our duplex filters, are manufactured by FILTERS. They are the results of over 60 years design development.

Test system

FILTERING CARTRIDGES

The filtering cartridges, mounted on our duplex filters, are manufactured by FILTERS in a clean room facility to ensure the best quality of the product.

PERFORMANCE

Performance of our duplex filters is tested in our internal laboratory using proper facility. Filtration performance is tested according to ISO 16889.

CUSTOMIZING

Specially in the Oil&Gas industry is necessary to conform the construction of the vessel according to the different specifications, depending on the final customer. This is the point of strenght of our organization that can approach any kind of special requirements.

TOTAL QUALITY

FILTERS is persuaded that a total quality management practice corresponds to competitive advantages. Our experience strongly demonstrate this relationship.

ENVIRONMENT CARE

FILTERS have always defined progress in human terms: it's not just about building more equipment, but also about limiting the environmental impact. The company's environmental policy follows the principle that protection of our environment is one of the company's main priorities.

OUR KNOW-HOW

OUR ACKNOWLEDGEMENT



Duplex Filters



APPLICATION

Filtration of pressurized lube, hydraulic and fuel oil.
Direct installation on pipelines.
Continuous operation due to duplex filter design.

DESIGN

Two filter housings in carbon steel or stainless steel, connected with a 6 way change-over valve unit with integrated pressure equalisation.

Material as per table at page 8 of this brochure.

Standard and customized construction according to :

- Manufacturer standard with certification as per EN 10204 type 3.1.B
- ASME VIII div. 1 design, not stamped,
- ASME VIII div. 1 design, "U" stamped
- CSA B51 / CRN (Canadian Registration Number)
- AS 1210 (Australian standard)
- PED 97/23 (European Pressure Equipment Directive)
- Russian code: GOST + Technical Passport for Russian application
- Algerian Authority requirements DPP (passport)
- Chinese Regulation for boiler and pressure vessels
- Brazilian regulation NR 13 for pressure vessel

FILTER ELEMENTS

Pleated design with optimised pleat density and filtration area.

The filter element is the most important component of the filter for long life and wear protection of the system.

Oil cleanliness, initial pressure drop and dirt holding capacity are the most important criteria for selection.

For further detailed informations, please refer to our filter elements "Series F" brochures.

ACCESSORIES

On request, our duplex filter can be equipped with a wide range of accessories like differential pressure indicator, differential pressure transmitter, pressure switch pressure safety valve, etc...

FILTER SELECTION

To select the proper filter for your service refer to next pages.

Pages 4 & 5 tables for filter pressure drop versus flow rate (at different viscosity).

Pages 6 & 7 tables with filter dimensions.

For further questions, please contact us.



PERFORMANCE DATA:

Item (DN)	Casing max Flow Lpm	Filtration µm	FLOW RATE @ PRESSURE DROP / VISCOSITY							
			OIL TYPE: ISO VG 32				OIL TYPE: ISO VG 46			
			17 cSt (@ 55°C)		32 cSt (@ 40°C)		25 cSt @ 55°C		46 cSt (@ 40°C)	
			Flow Lpm	ΔP Bar	Flow Lpm	ΔP Bar	Flow Lpm	ΔP Bar	Flow Lpm	ΔP Bar
1A	80	5 HT	21	0,21	21	0.36	-	-	-	-
		12	80	0,44	80	0,61	59	0,34	59	0,49
		22	80	0,38	80	0,50	80	0,45	80	0,61
1B		12	80	0,37	80	0,47	80	0,43	80	0,56
		22	80	0,35	80	0,44	80	0,40	80	0,51
		5HT	80	0.43	80	0.60	-	-	-	-
12HT		80	0.34	80	0.43	-	-	-	-	
1C	5HP	80	0.57	80	0.79	80	0.69	80	0.69	
1,5	205	12	205	0,35	205	0,47	205	0,42	205	0,58
		22	205	0,33	205	0,42	205	0,39	205	0,51
2	358	12	358	0,40	358	0,50	358	0,46	358	0,60
		22	358	0,38	358	0,46	358	0,43	358	0,54
3A	900	12	828	0,41	828	0,58	575	0,29	575	0,55
		22	900	0,39	900	0,54	815	0,46	815	0,57
3B		12	900	0,39	900	0,53	850	0,46	850	0,63
		22	900	0,35	900	0,47	900	0,92	900	0,56
3C		12	900	0,35	900	0,45	900	0,41	900	0,54
		22	900	0,33	900	0,42	900	0,38	900	0,48
3D		12	900	0,33	900	0,41	900	0,39	900	0,49
		22	900	0,31	900	0,38	900	0,36	900	0,44
4A	1500	12	1500	0,37	1500	0,50	1398	0,40	1398	0,57
		22	1500	0,34	1500	0,44	1500	0,40	1500	0,54
4B		12	1500	0,32	1500	0,40	1500	0,37	1500	0,49
		22	1500	0,30	1500	0,37	1500	0,34	1500	0,44
5	2320	12	2320	0,39	2320	0,56	1780	0,34	1780	0,50
		22	2320	0,36	2320	0,49	2320	0,42	2320	0,58
6A	3500	12	2555	0,34	2555	0,50	1780	0,25	1780	0,41
		22	3500	0,45	3500	0,63	2445	0,34	2445	0,50
6B	3500	12	3500	0,43	3500	0,59	2795	0,37	2795	0,54
		22	3500	0,39	3500	0,52	3500	0,46	3500	0,62
8	6780	12	3840	0,28	3840	0,44	2670	0,23	2670	0,37
		22	5280	0,32	5280	0,47	3670	0,28	3670	0,44

FILTRATION RATIO CORRESPONDANCE TABLE

β values as per ISO 16889	Corresponding to	β values as per ISO 4572
$\beta_{5,4} \mu\text{m(c)} > 1000$	=	$\beta_3 > 200$
$\beta_7 \mu\text{m(c)} > 1000$	=	$\beta_6 > 200$
$\beta_{12} \mu\text{m(c)} > 1000$	=	$\beta_{12} > 200$
$\beta_{22} \mu\text{m(c)} > 1000$	=	$\beta_{25} > 200$



PERFORMANCE DATA:

Item (DN)	Casing max Flow Lpm	Filtration μ m	FLOW RATE @ PRESSURE DROP / VISCOSITY							
			OIL TYPE: ISO VG 100				OIL TYPE: ISO VG 150			
			50 cSt (@ 55°C)		100 cSt (@ 40°C)		67 cSt @ 55°C		150 cSt (@ 40°C)	
			Flow Lpm	Δ P Bar	Flow Lpm	Δ P Bar	Flow Lpm	Δ P Bar	Flow Lpm	Δ P Bar
1A	80	12	27	0,20	27	0,36	18	0,16	18	0,33
		22	45	0,28	45	0,46	30	0,20	30	0,38
1B		12	54	0,33	54	0,50	36	0,22	36	0,40
		22	72	0,49	72	0,70	48	0,29	48	0,50
1,5	205	12	115	0,27	115	0,43	76	0,20	76	0,37
		22	160	0,34	160	0,53	107	0,24	107	0,42
2	358	12	265	0,39	265	0,59	176	0,12	176	0,42
		22	358	0,56	358	0,78	250	0,36	250	0,58
3A	900	12	265	0,19	265	0,35	176	0,15	176	0,33
		22	375	0,23	375	0,39	250	0,17	250	0,34
3B		12	390	0,23	390	0,39	260	0,18	260	0,34
		22	540	0,31	540	0,49	360	0,21	360	0,40
3C		12	600	0,34	600	0,51	400	0,23	400	0,41
		22	815	0,50	815	0,70	545	0,31	545	0,51
3D		12	780	0,43	780	0,62	522	0,28	522	0,48
		22	900	0,46	900	0,64	722	0,41	722	0,64
4A	1500	12	643	0,22	643	0,38	428	0,17	428	0,35
		22	900	0,27	900	0,38	585	0,19	585	0,37
4B		12	1175	0,37	1175	0,50	782	0,24	782	0,44
		22	1500	0,46	1500	0,65	1085	0,35	1085	0,56
5	2320	12	818	0,20	818	0,36	545	0,16	545	0,33
		22	1125	0,24	1125	0,40	750	0,18	750	0,36
6A	3500	12	818	0,18	818	0,34	545	0,15	545	0,32
		22	1125	0,20	1125	0,36	750	0,16	750	0,34
6B	3500	12	1285	0,20	1285	0,36	858	0,16	858	0,34
		22	1800	0,26	1800	0,43	1200	0,18	1200	0,36
8	6780	12	1225	0,17	1225	0,32	815	0,14	815	0,31
		22	1690	0,19	1690	0,34	1125	0,15	1125	0,32

STANDARD DESIGN CONDITIONS:

	ITEMS																	
	1A		1B		1C	1,5		2	3A	3B	3C	3D	4A	4B	5	6A	6B	8
	LP	HP	LP	HP	HP	LP	HP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
Pressure, Barg	14	65	14	65	100	14	65	14	14	14	14	14	14	14	14	14	14	14
Temperature, °C	100	175	100	175	100	100	175	100	100	100	100	100	100	100	100	100	100	100

LP = Low Pressure version HP = High Pressure version

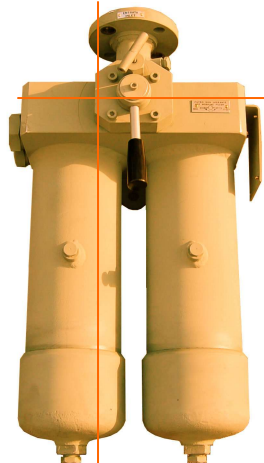


Figure A.1 Support detail

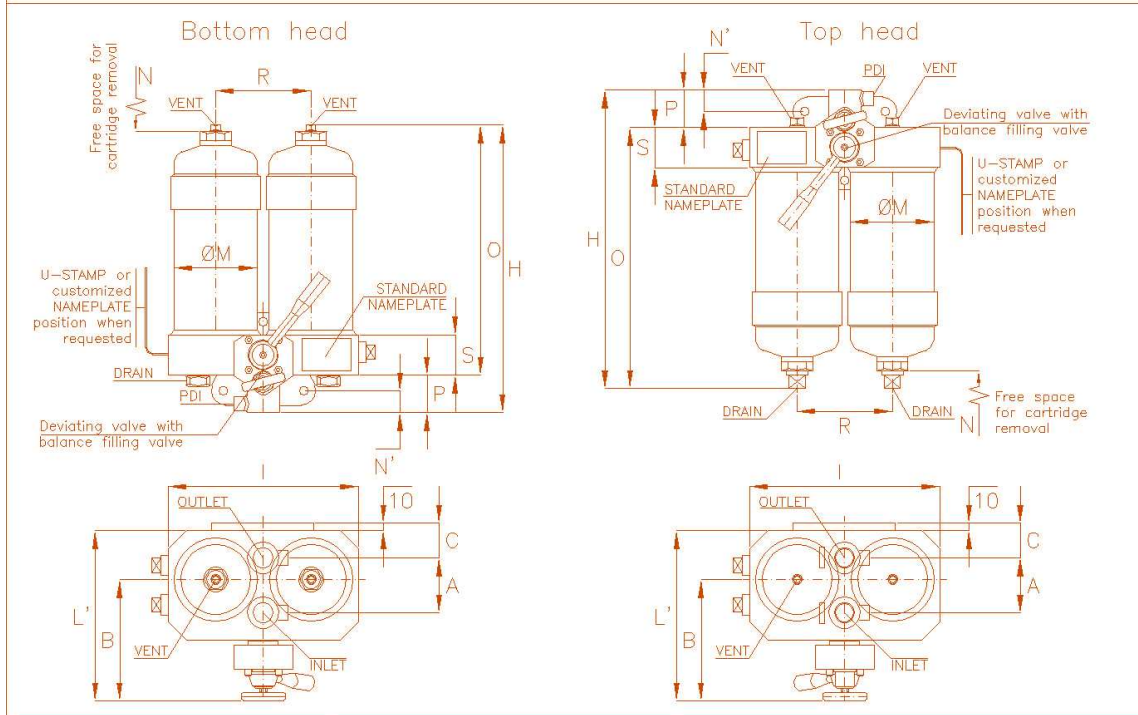


Figure A.2 Flanged version

Figure A.3 Support detail

Figure A.4 Nameplate support detail

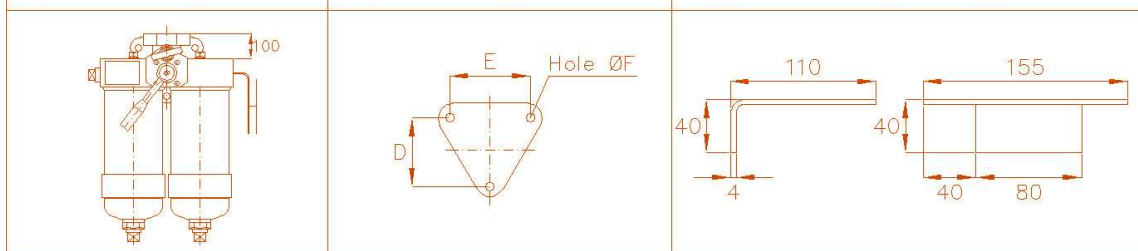


Table A.1 –Connections, volumes & weights

Item	Code	Fig.	CONNECTIONS					Internal oil volume (lt)	Weight, kg	
			IN / OUT	Screwed version	Flanged version	Vent & Drain NPT-F	PDI NPT-F		Screwed	Flanged
1A HP	ADNHFX	A.1	1"	NPT-F	N/A	½"	¼"	2	20	N/A
1A LP		A.2	1"	N/A	SAE 3000PSI				N/A	23
1B HP	ADNHF1	A.1	1"	NPT-F	N/A	½"	¼"	5	27	N/A
1B LP		A.2	1"	N/A	SAE 3000PSI				N/A	30
1C	ADNHHF1	A.1	1"	NPT-F	N/A	½"	¼"	6	28	N/A
1,5 HP	ADNHF2	A.1	1,5"	NPT-F	N/A	½"	¼"	9	37	N/A
1,5 LP		A.1	1,5"	N/A	SAE 3000PSI				N/A	41
2	ADN2HF2	A.2	2"	N/A	SAE 3000PSI	½"	¼"	9	N/A	50

Table A.2 –Dimensions (mm)

Item	DIMENSIONS																
	A	B	C	D	E	Ø F	H	I	L	Ø M	N	N'(1)	O	P(1)	R	S	Q
1A	75	183	37	94	110	13	375	210	240	88,9	200	8,5	345	30	105	56	38
1B	75	183	47,5	94	110	13	380	260	252	114	200	8,5	350	30	130	56	38
1C	75	183	47,5	94	110	13	455	260	252	114	200	8,5	425	30	130	56	38
1,5	100	208	49,0	120	130	17	527	300	280	127	330	16	494	33	170	75	44
2	100	208	49	140	130	17	547	300	280	127	330	/	514	/	170	95	45

(1)- dimensions N' & P are valid for screwed version only, Flanged ones have different values as shown on fig.A.3

Figure A.5 Duplex filter from ND3" to ND6"

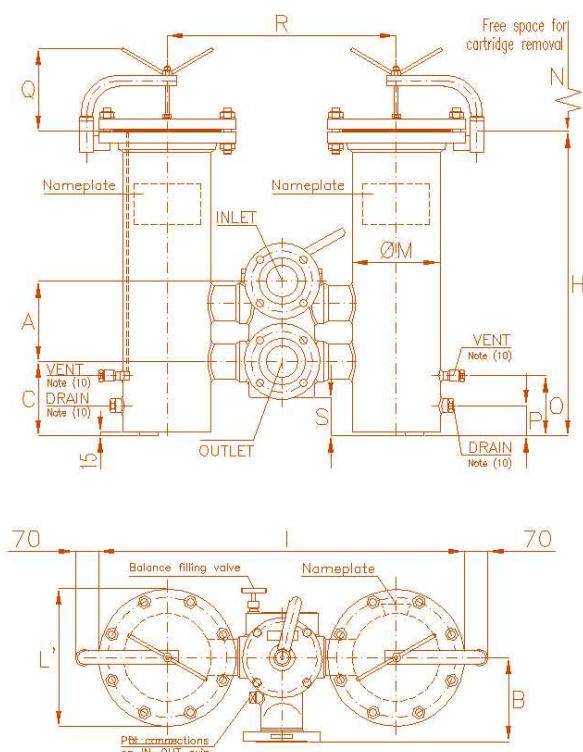


Figure A.7 FOUNDATION PLAN

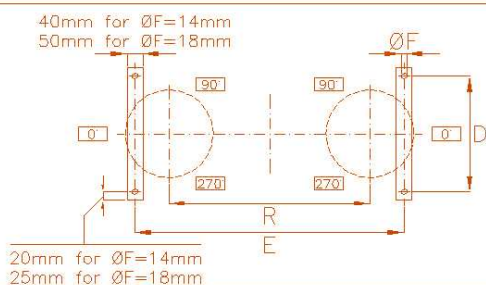


Figure A.6 Duplex filter ND8"

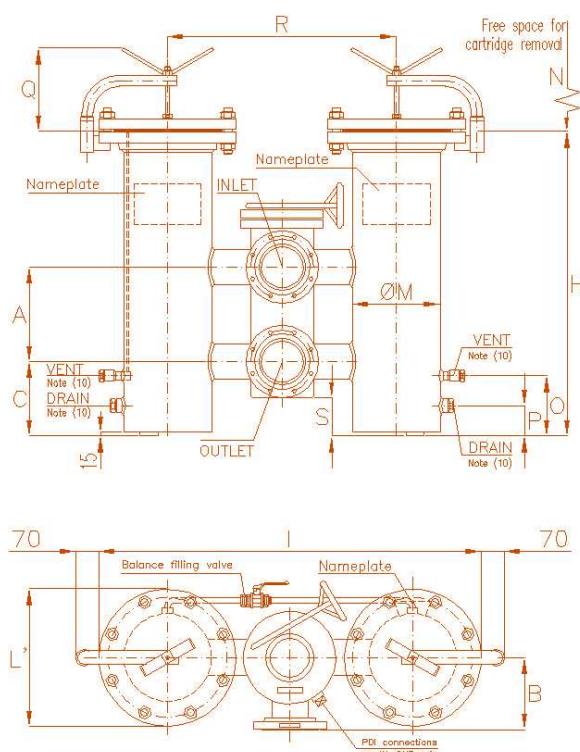


Figure A.8 Nameplate support detail

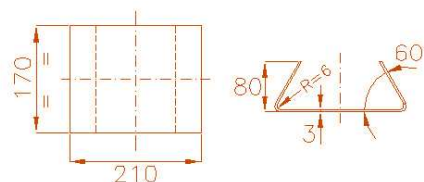


Table A.3 –Connections, volumes & weights

Item	Mfr. code	Figure	Connections (11) (12)				Internal oil Volume (lt.)	Weight (kg)
			IN / OUT	Vent NPT-F	Drain NPT-F	PDI NPT-F		
3A	D6PH31F3.....A	A.5	3"ANSI 150 RF R9	½"	¾"	¼"	50	220
3B	D6PH31F3.....B	A.5	3"ANSI 150 RF R9	½"	¾"	¼"	65	255
3C	D6PH31F3.....C	A.5	3"ANSI 150 RF R9	½"	¾"	¼"	85	270
3D	D6PH32F3.....	A.5	3"ANSI 150 RF R9	½"	¾"	¼"	170	450
4A	D6PH41F5.....A	A.5	4"ANSI 150 RF R9	½"	¾"	¼"	85	325
4B	D6PH43F3.....	A.5	4"ANSI 150 RF R9	½"	¾"	¼"	340	675
5	D6PH52F5.....	A.5	5"ANSI 150 RF R9	½"	¾"	¼"	200	590
6A	D6PH62F5.....A	A.5	6"ANSI 150 RF R9	½"	¾"	¼"	200	625
6B	D6PH62F5.....B	A.5	6"ANSI 150 RF R9	½"	¾"	¼"	260	640
8	D6PH83F5.....	A.6	8"ANSI 150 RF R9	½"	¾"	¼"	400	1050

For dimensions see next page table A.4

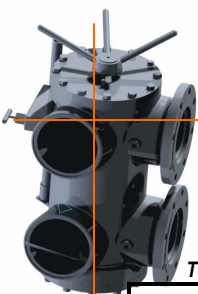
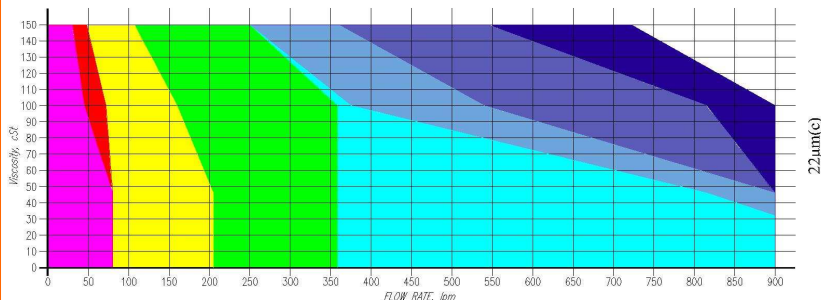
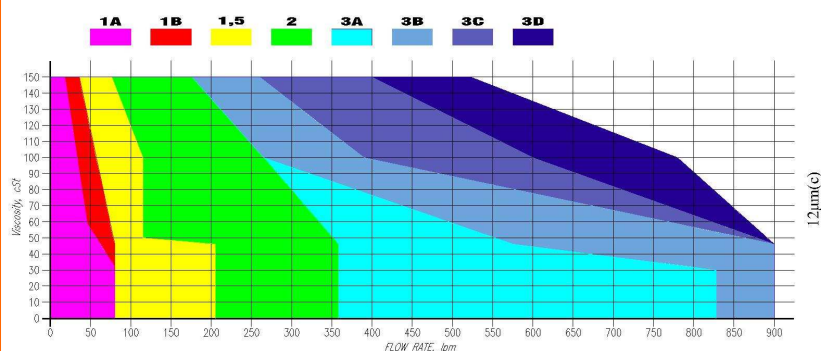


Table A.4 –Dimensions (mm)

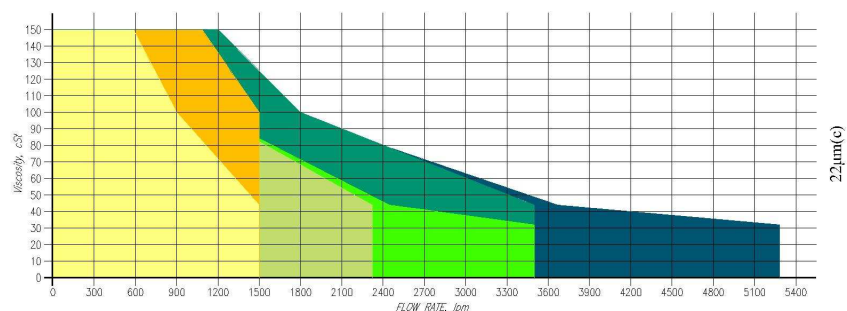
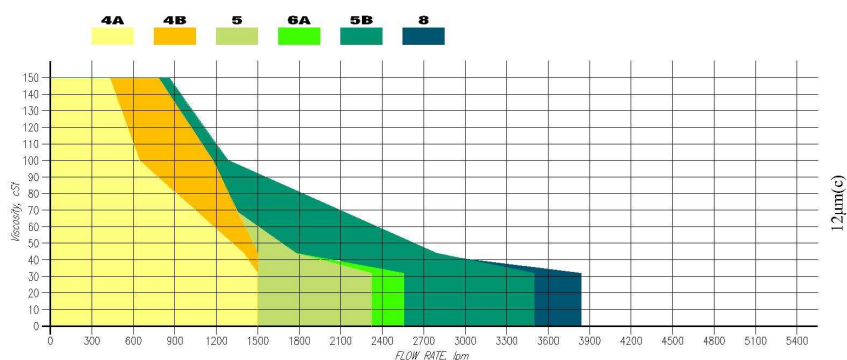
Item	DIMENSIONS															
	A	B	C	D	E	ØF	H	I	L	ØM	N	O	P	Q	R	S
3A	200	210	185	290	670	14	758	913	343	219	430	110	75	270	570	95
3B	200	210	185	290	670	14	983	913	343	219	660	110	75	270	570	95
3C	200	210	185	290	670	14	1308	913	343	219	1000	110	75	270	570	95
3D	200	210	185	380	910	18	1055	1243	533	355	660	120	105	290	710	95
4A	230	230	210	290	700	18	1357	943	343	219	1000	110	75	270	600	105
4B	230	230	210	400	1080	18	1112	1377	597	406	660	130	105	290	780	105
5	285	255	260	380	1040	18	1210	1293	533	355	660	120	105	290	800	153
6A	285	255	260	380	1040	18	1210	1373	533	355	660	120	105	290	800	153
6B	285	255	260	380	1040	18	1530	1373	533	355	1000	120	105	290	800	153
8	400	350	340	400	1260	18	1362	1597	597	406	660	130	105	290	1000	155

Filters selection Graph



Sizes from
ND1"
to
ND2"

Sizes from
ND4"
to
ND8"



ORDERING CODE COMPOSITION

Typical Code: D6PH31F30224EB

Manufacturer Code composition						
1 st Part	2 nd Part	3 rd Part	4 th Part	5 th Part	6 th Part	7 th Part
D6PH31F3	0	2	2	4	E	B

Part 1st: The first letters indicate the filter family; for detail to see table 1 at page 3

Part 2nd: These one digits indicate the filter cartridge material as per the following table:

CODE	CASING		CARTRIDGE	
	Vessel & valve body	O-Ring	End caps & Center tube	O-Ring
0	Killed Carbon steel (1)	NBR (Buna)	Galvanized CS AISI 316	NBR (Buna)
1	Stainless steel AISI 316L (2)	NBR (Buna)		
2	Stainless steel AISI 316L (2)	NBR (Buna)		
3	Killed Carbon steel (1)	FKM (Viton)	Galvanized CS AISI 316	FKM (Viton)
4	Stainless steel AISI 316L (2)	FKM (Viton)		
5	Stainless steel AISI 316L (2)	FKM (Viton)		
6	Killed Carbon steel (1)	NBR (Buna)	Galvanized CS AISI 316	FLUORO-SILICONE
7	Stainless steel AISI 316L (2)	NBR (Buna)		
8	Stainless steel AISI 316L (2)	NBR (Buna)		

Part 3rd: These one digits indicate the design code and rules:

CODE	DESIGN - CONSTRUCTION - CERTIFICATION CODE (last issue applicable)
0	Manufacturer std. with certification as per EN 10204 type 3.1.B
1	ASME VIII div. 1 design, not stamped, with certification per EN 10204 type 3.1.B and WPS/PQR/WQR
2	ASME VIII div. 1 design, "U" stamped (plus Registration Number, if applicable)
3	CSA B51 / CRN (Canadian Registration Number), installation province to be specified in the order
4	AS 1210 (Australian std.)
5	PED 97/23 (European Pressure Equipment Directive) + ASME VIII div. 1 not stamped
6	Russian code: GOST + Technical Passport for Russian application
7	Algerian Authority requirements DPP (passport) + ASME VIII div. 1 not stamped
8	Chinese Regulation for boiler and pressure vessels + ASME VIII div. 1 not stamped
9	Brazilian regulation NR 13 for pressure vessel + ASME VIII div. 1 not stamped

Part 4th: Special features and vent-drain orientation code:

CODE	Valid Only for Sizes 1" and 1.5"		Valid Only for Size 2" up to 8"		
	Connection Configuration	Special Nameplate (3)	Davit supply (24)	Special Nameplate (3)	Vent & drain position
0	Threaded (HP) (as per fig 6.1a)	No	No	No	0°
1		Yes	Yes		
2	Flanged (LP) (as per fig 6.1b)	No	Yes	Yes	90°
3		Yes	No	No	
4	NOT AVAILABLE		Yes	Yes	
5			Yes	No	270°
6			No	Yes	
7			Yes	No	
8			Yes	Yes	

Part 5th: Filtration degree

CODE	CARTRIDGE SELECTION CODE
3	Mfr MF Filters, filtration degree: 5 µm (β ₅ µm(c)>1000 ISO 16889)
4	Mfr MF Filters, filtration degree: 12 µm (β ₁₂ µm(c)>1000 ISO 16889)
5	Mfr MF Filters, filtration degree: 22 µm (β ₂₂ µm(c)>1000 ISO 16889)

Part 6th: Hazardous area classification

CODE	HAZARDOUS AREA CLASSIFICATION
A	Safe area
D	IEC / ATEX – zone 1, IIB, T4
E	IEC / ATEX – zone 2, IIB, T3
F	NEC / NEMA / CSA – class 1, div. 1, gas group C & D, T4
G	NEC / NEMA / CSA – class 1, div. 2, gas group C & D, T3

Part 7th: Model differentiation: applicable for model d6... (see table 1 at page 3)



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Regione Botteghe, 28

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C.C.I.A.A. Torino 738618
C.so Vinzaglio, 12 bis

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- S.Statale 23 Km 28.5 Fraz. Viotto – 10060 Scalenghe (TO)
- Regione Botteghe, 28 – 10060 Scalenghe
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TO EXCELLENCE
IS YOUR PATH
TO SUCCESS**