hydraulics

HYDRAULICS FILTERS and ACCESSORIES

Why is filtration essential?

Even when you project and make the best possible hydraulic system *as soon as you start using it* the contamination already present and constantly generated will wear and eventually permanently damage the whole system.

The only protection to avoid this is to keep contamination level under control. The better you do it the longer system life will be.

Few words about contamination

When examining what contamination is we must admit we're facing a random and complex world. Just consider:

- from the beginning all possible kind of dirt, like: dust, textile and/or paper parts (mainly used to clean!)

rust, paint, metal and plastic particles left when assembling the components together, etc...

- in working conditions metal and plastic/rubber wear particles generated by components frictions (plastics parts, besides, expanding and melting with temperature increases).

Dust introduced by air going into the system.

Chemical reactions of the various parts amongst the and in presence of air.

A major problem is the random form of the contaminant particles

All we can realistically do, in these conditions, is to classify filter efficiency by means of a repeatable test (general conditions and procedures are fixed) called multipass test (as per ISO 4406:1999).

The contaminant, though, is of spherical forms (although of various sizes) and this does not correspond to the average real contaminant particles form.

The test basically gives two parameters:

Beta ratio, where $\beta x = \frac{x\ in}{x\ out}$ *and "x" means a determined particle size expressed in µm (10-6 meters in diameter).*

I.E.: considering a beta ratio for particle size 10 µm, having 105 particles "in" and 103 "out" our

$$\beta_{10} = \frac{10^5}{10^3} = 10^2 = 100$$

filtration efficiency (Given in %) = 100 - (100/βx)

I.E. *βx = 2 means 50%*
βx = 20 means 25%
βx = 75 means 98,67%
βx = 100 means 99%

TAB. 01.2	
6F	6 µm FIBER GLASS
10F	10 µm FIBER GLASS
25F	25 µm FIBER GLASS
10	10 µm PAPER
25	25 µm PAPER
60	60 µm SQUARE MESH
90	90 µm SQUARE MESH
125	125 µm SQUARE MESH

*other filtration ratings available on request

Which filter?

Hydraulic and air filters are used to keep under control the contamination level of an hydraulic system. Depending on their location in the system, the filters are commonly classified as follows:

Return line filters: located downstream of all " working" components they assure a general, constant, system contamination level. Consequently indirectly protecting all the components to a specific contamination size. They should be sized to guarantee a high dirt holding capacity (maximizing the time of their life). Elements should assure a filtration efficiency βx ≥ 75 and filtration ratings ("x") to be in the range 10 to 25 µm.

Inline Filters: installed on the pressure line, they directly protect one or more component. Elements should have a βx ≥ 75 (where "x" ranges between 3, to 10 µm).

Suction filters: mounted on the pump inlet line, protect the pump from coarse contaminants. The elements are commonly made in metal mesh. Special care must be taken to avoid pump cavitation. Typical "X" value being 125, and sometimes 60 µm.

Air filters: keeping in-coming air contamination in the oil tank to (or below) 10 µm.

Pressure drop

Next step is to choose the right filter dimension. To do this please refer to our filter flow rate-pressure drop graphs.

Pressure drop values are always given for the complete filter oil viscosity is referred for hydraulic oil VG46 at working temp. Of course an higher or lower viscosity is automatically modifying the general filter performance. In case of any dubt please contact us.

When sizing the right filter it's a good rule to comply to the recommended fluid speed:

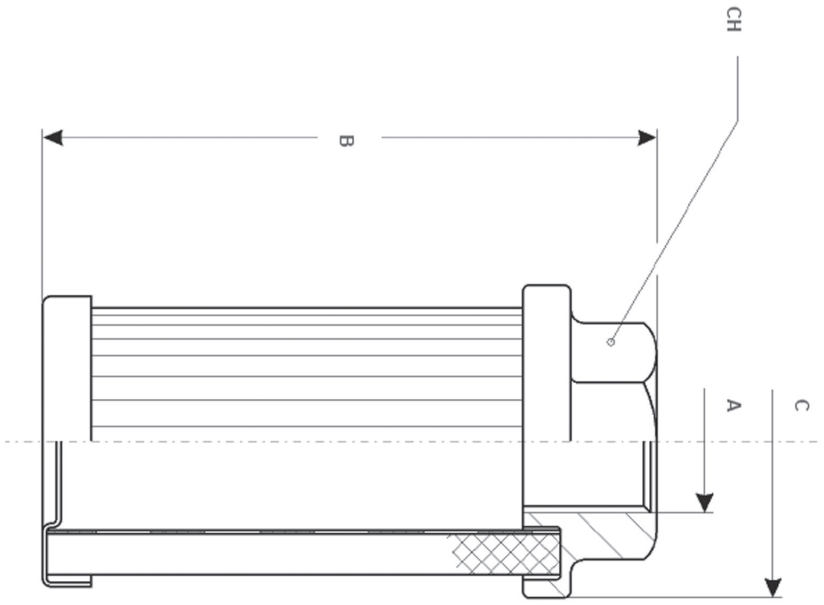
Suction line from 1 to 1 m/s
Return line from 1.5 to 4 m/s
Pressure (inline) from 5 to 10 m/s

Finally, a dirt element warning device (clogging indicator) is greatly helping to avoid incorrect maintenance, and consequent permanent damage of the hydraulic system components.Clogging indicator used are visual or electric (or both together).

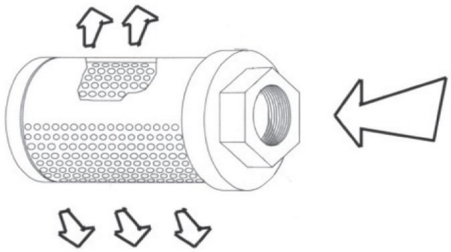
Note: we expertize in filtration and are always keen to evaluate the production of special filters, even for small quantities. Should this be of your interest, please do not hesitate to contact us.

RB Hydraulics reserves the right to make changes to the product described here in at any time it deems fit in relation to technical or commercial requirements.

ST - *Suction stainers* D - *Diffusors*



DIFFUSORS



Type	Lt/min	A BSPP/NPT	B	C	CH
ST-14	12	¼"	90	46	24
ST-38	12	⅜"	90	46	24
ST-12	15	½"	105	46	30
ST-34	25	¾"	109	64	36
ST-100A	50	1"	139	64	46
ST-100B	80	1"	139	86	52
ST-114	90	1 ¼"	139	86	52
ST-112A	95	1 ½"	139	86	60
ST-112B	130	1 ½"	200	86	60
ST-112C	220	1 ½"	151	150	70
ST-200A	180	2"	260	86	70
ST-200B	225	2"	151	150	70
ST-212	350	2 ½"	211	150	90
ST-300	500	3"	272	150	100

ST SUCTION STAINERS

Filter to be mounted on the pump suction line for flow from 25 to 200 lt/min. Standard filtration media is 12 µm, AISI 304 stainless steel mesh. Other micron rating and by-pass valve available on request.

D DIFFUSORS

Diffusors are useful to slow down oil speed when it is returning to the tank. They greatly reduce noise level, turbulence and foaming problems in the oil tank.

ORDERING CODE

ST 200A 90

1 2 3

1 - ST for suction strainers D for diffusors

2 - Size and connection (see table)

3 - Filtration rating (see tab. 01.2)
90 µm
125 µm
300 µm

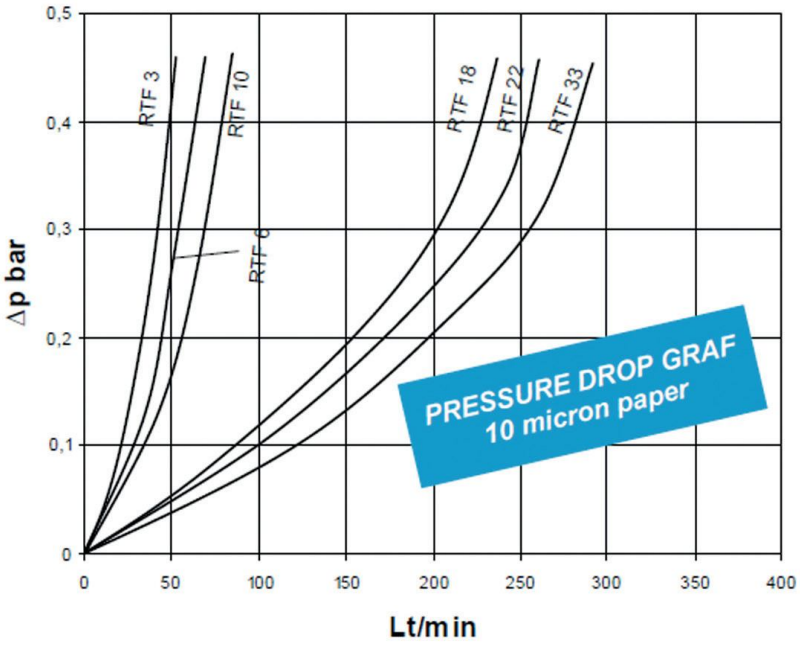
RTF - *Return line filter*

RTF

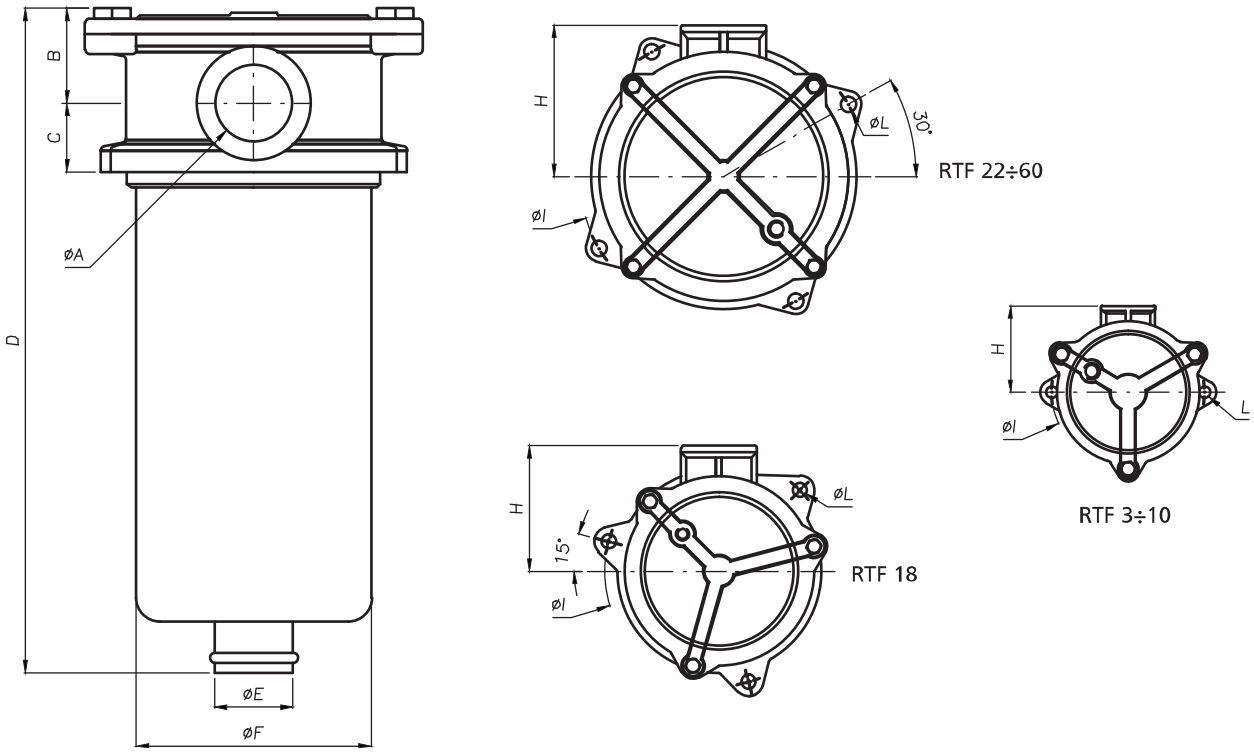
Is the series of return lines, tank top mounting. Specifically been designed for use on mobile application, agricultural machinery and powerunits. The range includes four different sizes with nominal flow rates up to 400L/min.

Filter housing materials

Indicator	Brass + nylon
By-pass valve	Nylon
Seals	Nitrile (Burns-N)
Cover	Aluminium die - casting
Filter bowl	Cataphoresis treated steel
Filter head	Aluminium die-casting
Filter pressure	Max working pressure:7 bar
Working temperature	-10 to 80s° C (3 bar)
By-pass valve setting pressure	Return: (1.7) ± 10% (starting opening)



The graphics refer to mineral oil with a kinematic viscosity VG 46.
The variation of the pressure drop is porportional to the kinematic viscosity



Filter	Element	A	B	C	D	E	F	G	H	I	L	Weight Kg
		BSPP/NPT										
RTF- 3	RTFE- 3	½"	33	22	136	24	66	76	51	90	7	0,5
RTF- 6	RTFE- 6	¾"	44	28	170	28	88	87	67	115	8,5	1
RTF- 8	RTFE- 10	¾"	44	28	215	28	88	87	67	115	8,5	1,1
RTF- 10	RTFE- 10	1"	44	28	215	28	88	87	67	115	8,5	1,1
RTF-12	RTFE-12	1"	44	25	322	28	88	87	67	115	8.5	1,3
RTF- 18	RTFE- 18	1 ¼"	54	35	335	40	129	97	96	175	10,7	2,2
RTF- 22	RTFE- 22	1 ¼"	60	38,5	272	50	173	103	115	220	11,5	3
RTF- 33	RTFE- 33	1 ½"	60	38,5	332	50	173	103	115	220	11,5	3,4
RTF- 60	RTFE- 60	1 ½"	60	38,5	375	50	173	103	115	220	11,5	3,4

ORDERING CODE (complete filter)

RTF 18 10 VCIV

1 2 3 4

ORDERING CODE (spare element)

RTFE 18 10

1 2 3

1 - RTF complete filter
RTFE spare element

2 - Size and connection
(see table above)

3 - Filtration rating (see tab. 01.2)

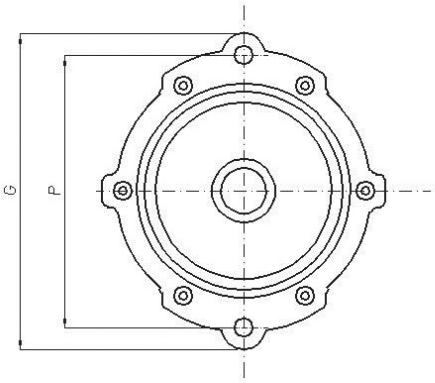
4 - INDICATORS
VCIP visual pressure indicator
EIP pressure electric indicator
- without indicator

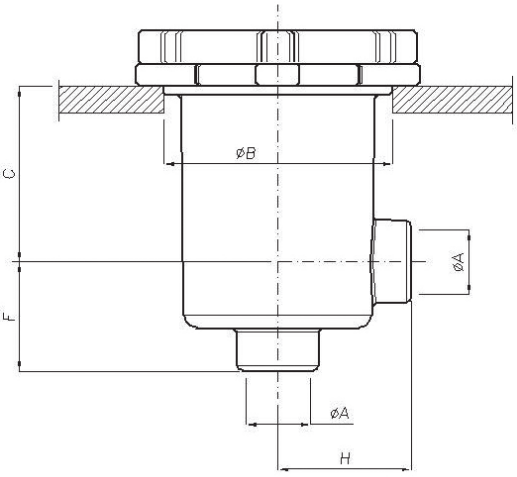
UCF - *Suction/ return line filters*

UCF

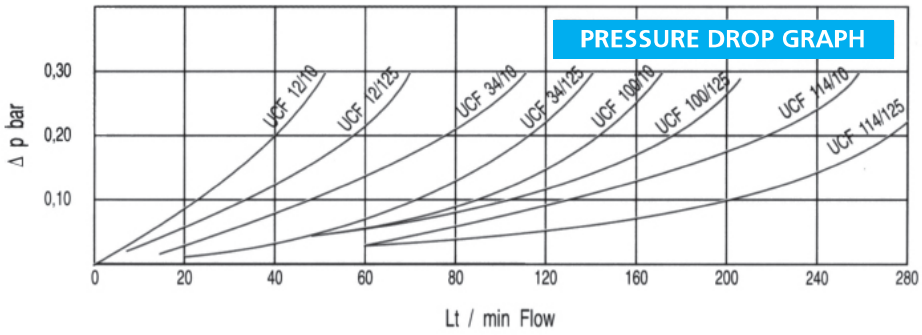
Suction or return line filters to be mounted with filter housing completely inside the oil tank. They can be directly connected to the pump inlet or manifold return line "T".

Max working pressure 10 bar Working temperature -10 to 80° C.
Nylon based, plastic composite material with high mechanical and thermical resistance.





Model	A BSPP	B	C	E	F	G	H	P
UCF - 12	½ "	88	72	7	40	11	49	100
UCF - 34	¾ "	110	68	9	52	14	61	126
UCF - 100	1 "	110	110	9	54	14	61	126



The graphics refer to mineral oil with a kinematic viscosity VG 46.
The variation of the pressure drop is porportional to the kinematic viscosity

ORDERING CODE (complete filter)

UCF 34 25 EIP R

1 2 3 4 5

ORDERING CODE (spare element)

UE 34 25 R

1 2 3 5

1 - UCF complete filter
UE spare element

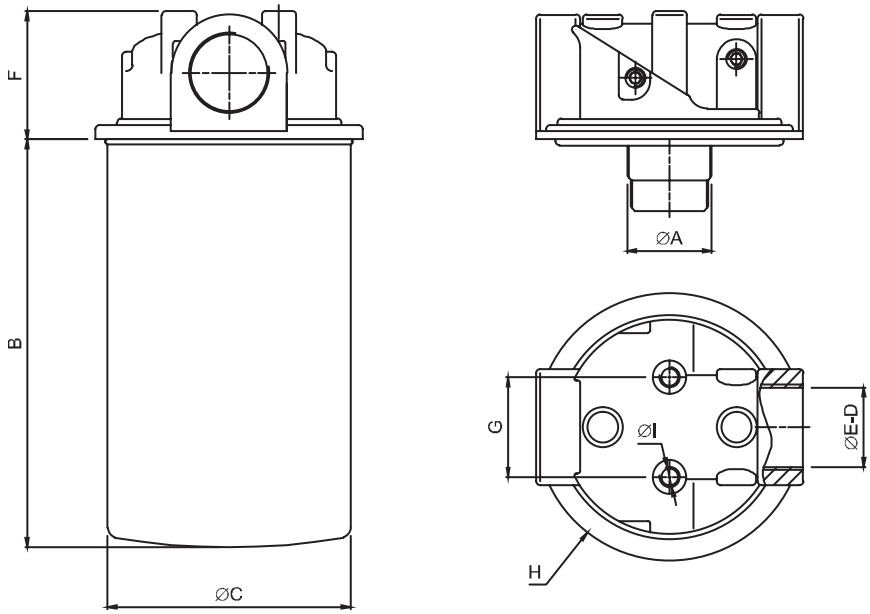
2 - Size and connection
(see table)

3 - Filtration rating (see tab. 01.2)

4 - INDICATOR
VCIV vacuum
VCIP presseure indicator
EIP pressure electric indicator
EIV vaccum electric indicator
- without indicator

5 - BY-PASS
R - Return line
A - SuctionMB line

SO - *Spin-on filters*



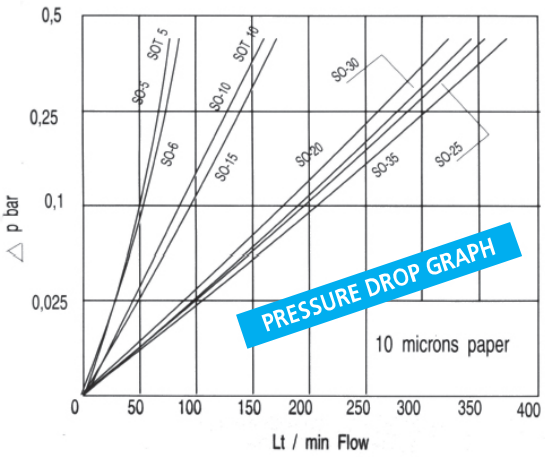
SO

Spin on type filters with disposable elements, suitable for application on suction or return line max. Working pressure 12 bar.

Working temperature -10/+80° Celsius

Wide range of element ratings available on request.

CODE	A	B	C	D	E	F	G	H	I
SO 5	3/4" BSPP	150	98	3/4" BSPP	3/4" BSPP	44	38	95	M8
SO 6		205							
SO 10	1 1/4" BSPP	180	132	1 1/4" BSPP	1 1/4" BSPP	61	50	133	MB
SO 15		226							



The graphics refer to mineral oil with a kinematic viscosity VG 46.
The variation of the pressure drop is porportional to the kinematic viscosity

ORDERING CODE (complete filter)

SO 10 10 VCIV R

1 2 3 4 5

ORDERING CODE (spare element)

SOE 10 10

1 2 3

1 - SO complete filter
SOE spare element

2 - Size and connection
(see table above)

3 - Filtration rating (see tab. 01.2)

4 - INDICATOR
VCIV vacuum
VCIP presseure indicator
EIP pressure electric indicator
EIV vaccum electric indicator
- without indicator

5 - BY-PASS
R - Return line
A - Suction line

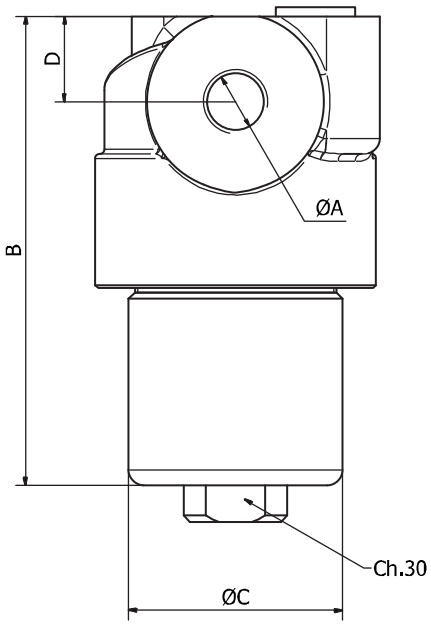
HPF30 - *High pressure filters*

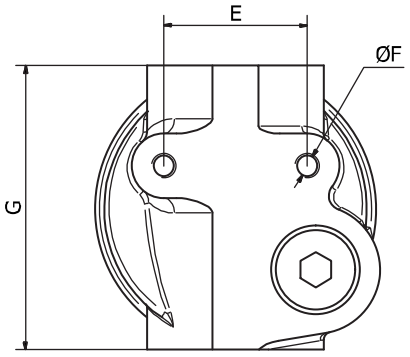
HPF 30

HPF is the high pressure filter series for pressure up to 420 bar. Our product range is composed by 3 diffrent size with nominal rated flow up to 350 l/min.

TECHICAL DATA

- Max working pressure 420 bar
- Testing pressure 600 bar
- Collapse pressure 20 or 210 bar
- Working temperature from -20 up to +95°C
- By-pass valve setting at 6 bar ± 10%
- Filtartion ratio from 3 up to 25 µm*
- Connection BSP - NPT - SAE





CONNECTIONS

Type	A	F
1	1/2" BSP	M8
2	3/4" BSP	M8
3	1/2" NPT	5/16" UNC
4	3/4" NPT	5/16" UNC
5	3/4" - 16UNF	5/16" UNC
6	1"1/16 - 12UN	5/16" UNC

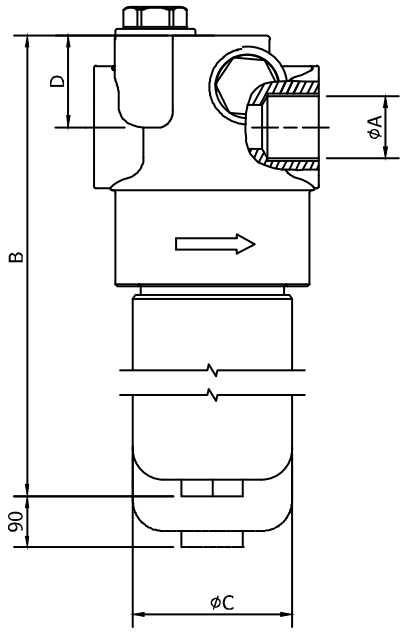
RECOMMENDED FLOWS

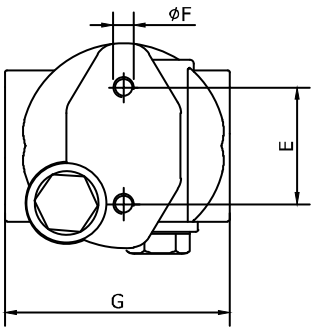
HPF	Element	Flow (l/min)	Weight (kg)
301	F03	15	4,2
301	F06	18	4,2
301	F10	33	4,2
301	F25	47	4,2
302	F03	22	4,5
302	F06	29	4,5
302	F10	50	4,5
302	F25	70	4,5
303	F03	32	5,8
303	F06	40	5,8
303	F10	60	5,8
303	F25	85	5,8

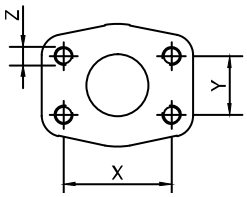
DIMENSIONS

Code..	B	C	D	E	F	G
HPF 301 ..	103	Ø70	29	47	M8	85
HPF 302 ..	145				M8	
HPF 303 ..	295				M8	

* Other filtration ratings available on request.







CONNECTIONS

Type	A	F
1	3/4" BSP	M10
2	1" BSP	M10
3	3/4" NPT	3/8" UNC
4	1" NPT	3/8" UNC
5	1"1/16 - 12UN	3/8" UNC
6	1"5/16 - 12UN	3/8" UNC
7	1" 1/4 BSP	M10

FLANGED CONNECTIONS

Type	Connections	X	Y	Z	F
9	1"SAE - 6000 PSI/ M	52.4	26.2	M10	M10
10	1"SAE - 6000 PSI/ UNC	52.4	26.2	3/8 UNC	3/8 UNC
11	3/4"SAE - 6000 PSI/ M	50.8	23.8	M10	M10
12	3/4"SAE - 6000 PSI/ UNC	50.8	23.8	3/8 UNC	3/8 UNC

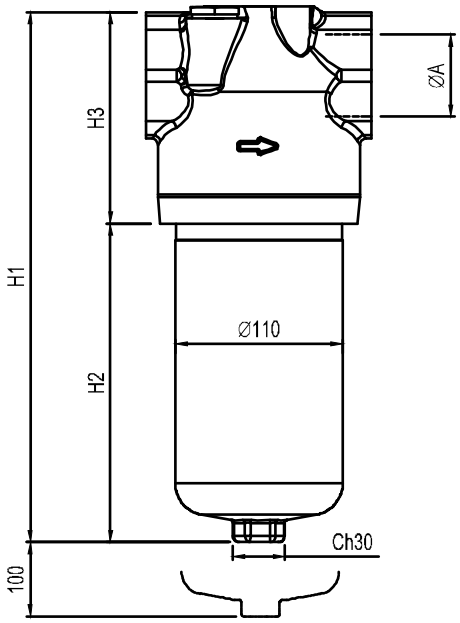
RECOMMENDED FLOWS

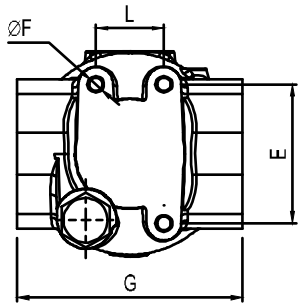
HPF	Element	Flow	Weight
601	F03	38	7.5
601	F06	55	7.5
601	F10	60	7.5
601	F25	75	7.5
602	F03	80	9.2
602	F06	90	9.2
602	F10	115	9.2
602	F25	145	9.2

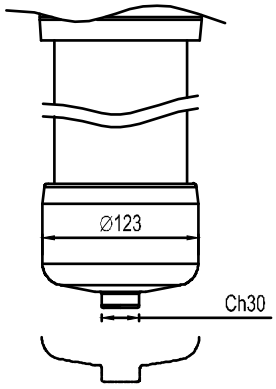
DIMENSIONS

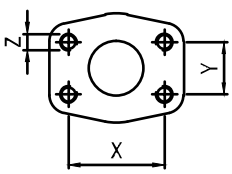
Code..	B	C	D	E	F	G
HPF 601 ..	270	Ø78	45	57	M10	110
HPF 602 ..	380				M10	

HPF90 - *High pressure filters*









CONNECTIONS

Type	A	F
1	1" BSP	M12
2	1"1/4 BSP	M12
3	1"1/2 BSP	M12
4	1" NPT	1/2" UNC
5	1"1/4 NPT	1/2" UNC
6	1"1/2 NPT	1/2" UNC
7	SAE 1" 5/8 - 12UN	1/2" UNC
8	SAE 1" 7/8 - 12UN	1/2" UNC

FLANGED CONNECTIONS

Type	Connections	X	Y	Z	F
9	1" 1/4 SAE - 3000 PSI/ M	58.7	30.2	M10	M12
10	1" 1/2 SAE - 3000 PSI/ M	70	35.7	M10	M12
11	1"1/4 SAE -3000 PSI/ UNC	58.7	30.2	7/16UNC	1/2 UNC
12	1"1/2 SAE -3000 PSI/ UNC	70	35.7	1/2 UNC	1/2 UNC
13	1" 1/4 SAE - 6000 PSI/ M	66.7	31.6	M14	M12
14	1"1/4SAE - 6000 PSI/ UNC	66.7	31.6	1/2 UNC	1/2 UNC

RECOMMENDED FLOWS

HPF	Element	Flow	Weight
901	F03	70	13.5
901	F06	80	13.5
901	F10	105	13.5
901	F25	155	13.5
902	F03	145	17.3
902	F06	180	17.3
902	F10	220	17.3
902	F25	245	17.3
903	F03	225	21
903	F06	260	21
903	F10	290	21
903	F25	365	21
904	F03	240	26
904	F06	265	26
904	F10	310	26
904	F25	345	26

DIMENSIONS

Code..	H1	H2	H3	G	E	L	F
HPF 901	337	199	128	143	88	43	M10
HPF 902	457	319					
HPF 903	558	420					
HPF 904	658	520					

HOW TO ORDER

HPF	602	F06	A	N	R	1

Type
301
302
303
601
602
901
902
903
904

Filtration ratio	
F03	3 µm - fibra
F06	6 µm - fibra
F10	10 µm - fibra
F25	25 µm - fibra
C10	10 µm - paper
C25	25 µm - paper
M10	10 µm - AISI 304
M25	25 µm - AISI 304

*

ΔP CARUCCIA	
A	20 bar
B	210 bar

SEALS	
N	Buna
V	Viton

BY-PASS	
R	Δp 6 bar
N	without

HPFE	602	F06	A	N

REPLACE ELEMENT

* Other filtration ratings available on request

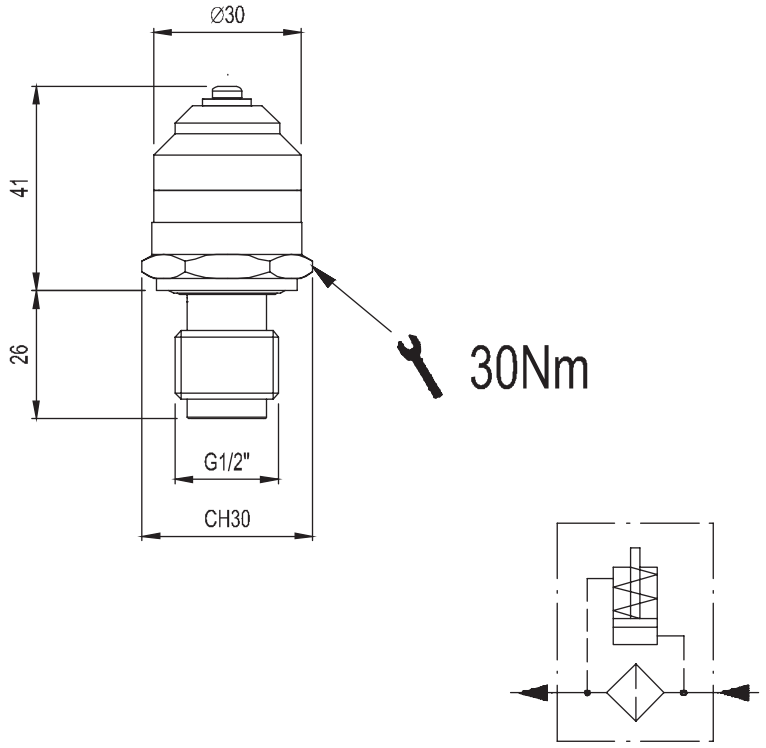
CONNECTION

-	HPF 30..	HPF 60..	HPF 90..
1	1/2" BSP	3/4" BSP	1" BSP
2	3/4" BSP	1" BSP	1" 1/4 BSP
3	1/2" NPT	3/4" NPT	1" 1/2 BSP
4	3/4" NPT	1" NPT	1" NPT
5	SAE 3/4" - 16UNF	SAE 1"1/16 - 12UN	1" 1/4 NPT
6	SAE 1"1/16" - 12UN	SAE 1"5/16 - 12UN	1" 1/2 NPT
7		1" 1/4 BSP	SAE 1" 5/8 - 12UN
8		1"SAE - 6000 PSI/ M	SAE 1" 7/8 - 12UN
9		1"SAE - 6000 PSI/ M	1" 1/4 SAE - 3000 PSI/ M
10		3/4"SAE - 6000 PSI/ UNC	1" 1/2 SAE - 3000 PSI/ M
11		3/4"SAE - 6000 PSI/ UNC	1"1/4 SAE -3000 PSI/ UNC
12			1"1/2 SAE -3000 PSI/ UNC
13			1" 1/4 SAE - 6000 PSI/ M
14			1"1/4SAE - 6000 PSI/ UNC

HPV - *Differential indicator*

TECHNICAL FEATURES

To properly maintain your system to the correct ISO 4406 contamination class, RB recommends the use of filters provided with the correct clogging indicator.



ORDERING CODE

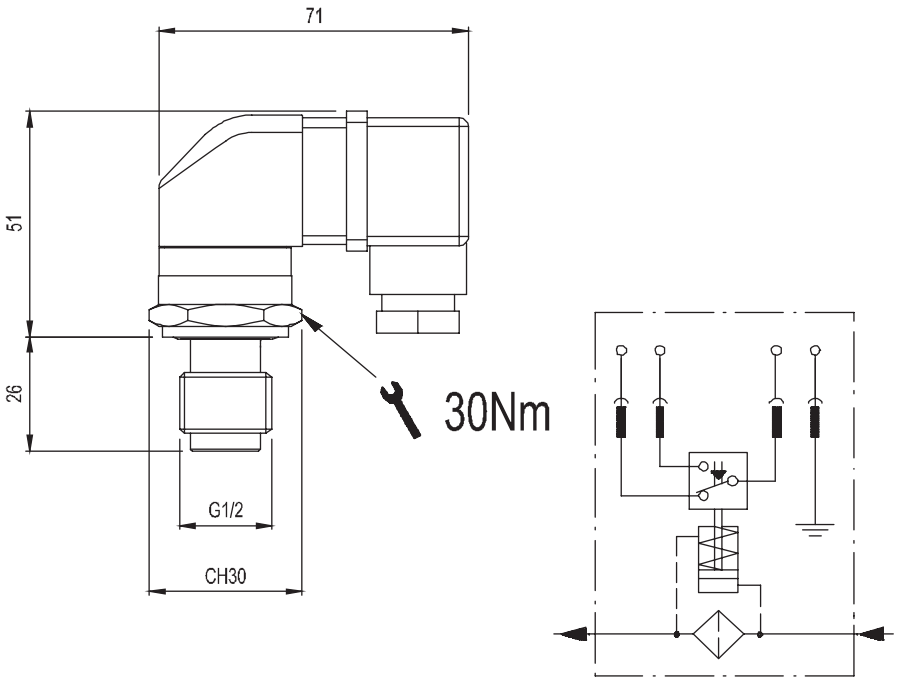
HPV

HPE - *Differential indicator*

TECHNICAL FEATURES

Indicator body in brass max working pressure 420 bar.

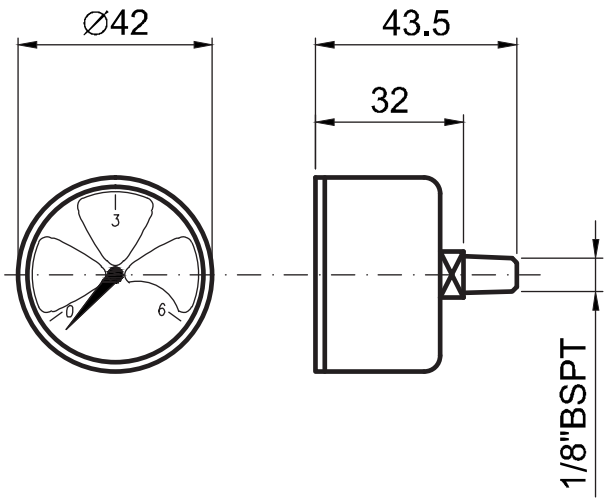
Working temperature From -35°C to +110°C. Seals HNBR or FPM. Bodies and seals compatible with mineral oils to ISO 2943 - aqueous emulsions synthetic fluids, water/glycol.



ORDERING CODE

HPE

VCIP-VCIV - *Visual clogging indicator*



Visual or electric clogging indicators. Easy and cheap way of monitoring element clogging on our filters type SO, UCF, RTF, ect.

TECHNICAL FEATURES

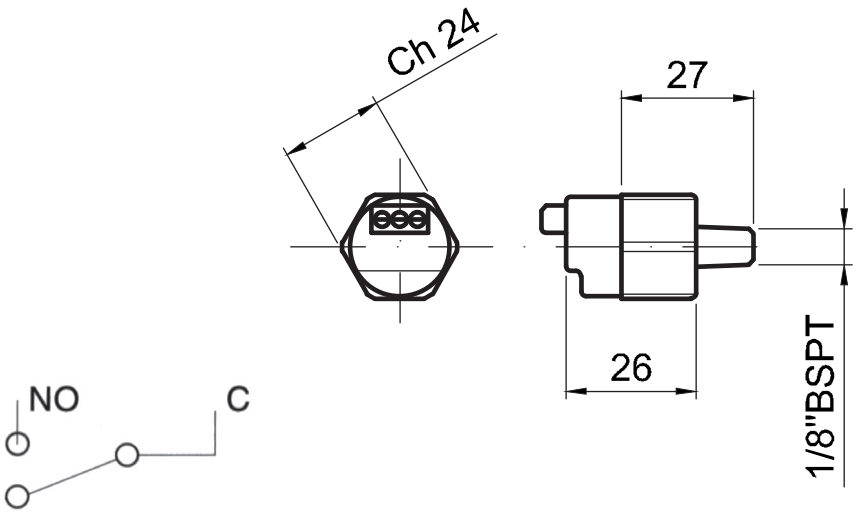
VCIP PRESSURE GAUGE 1.7 bar
VCIV VACUUM GAUGE 0.2 bar

- Pressure Gauge O.D. 43 mm
- ABS case. Dry Type.
- Colour scale: Green, Yellow, Red
- 1/8" BSPT back connection.

ORDERING CODE

VCIP pressure gauge
VCIV vacuum gauge

EIP-EIV - *Electric clogging indicator*



TECHNICAL FEATURES

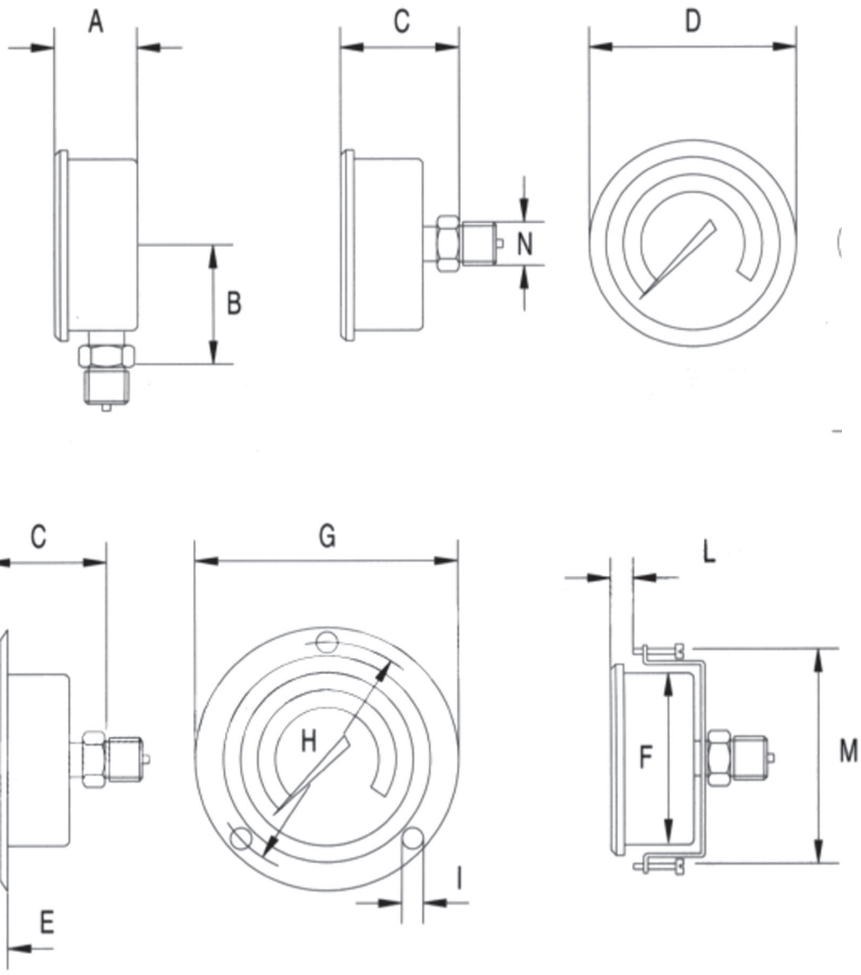
EIP PRESSURE SWITCH 1.7 bar
EIV VACUUM SWITCH 0.2 bar

- oil-proof rubber membran
- Micro Switch max 3A-250V A.C.
- Contacts in exchange.
- Working temp. -25 + 85°C.
- Test pressure 10 bar

ORDERING CODE

EIP electric pressure gauge
EIV electric vacuum gauge

PG - *Pressure gauge*



PG

These are glycerine filled pressure gauges and can be supplied in two different nominal sizes Ø 63 mm and Ø 100 mm and different type of connection and fixations.

Type	A	B	C	D	E	F	G	H	I	L	M	N BSP/ NPT	Weight Kg
PG - 63	30	76	46	68,5	9	62	87	75	3,6	6,5	79	¼"	0,2
PG - 100	31	69	50	107	9	100	132	116	4,8	6	126	½"	0,5

ORDERING CODE

PG 63 B / 0-160

1 2 3 4

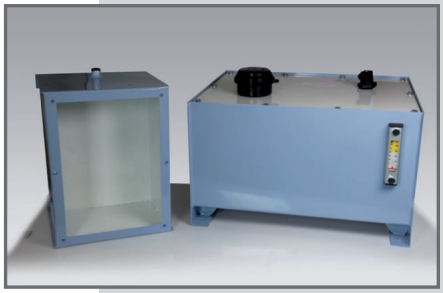
1- PG
pressure gauge

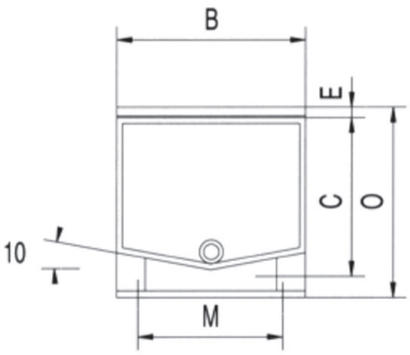
2- Size
(see table above)

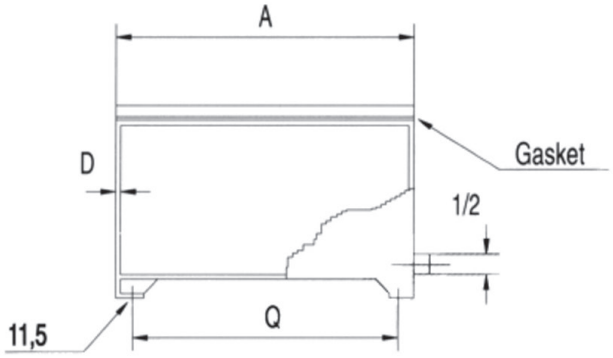
3- Connection
B - bottom
R - rear
C - rear connection with clamp
F - rear connection with 3 hole flange

4- Scale
0-10
0-20
0-60
0-100
0-160
0-250
0-315
0-400
0-600

OT - *Oil tank*







OT

Oil tank constructed in steel plate, oil and rust proof pre-painted.

Other sizes and wall thickness available on request.

Complete oil tank	Oil tank	Cover	Capacity Lt	A	B	C	D	E	M	O	Q	Cover fix
OTC - 12	OT - 12	C - 12	13	335	270	235	1,5	4	208	290	286	6 x M8
OTC - 16	OT - 16	C - 16	20	410	325	250	1,5	4	270	305	364	6 x M8
OTC - 30	OT - 30	C - 30	30	470	375	280	1,5	4	312	335	428	6 x M8
OTC - 55	OT - 55	C - 75	55	600	470	310	2	4	401	365	548	6 x M8
OTC - 75	OT - 75	C - 75	72	600	470	400	2	4	401	455	548	10 x M8
OTC - 100	OT - 100	C - 100	98	675	520	450	2,5	5	455	505	625	10 x M8
OTC -180	OT - 180	C - 180	160	805	620	500	2,5	5	555	555	755	10 x M8

DTOT Oil tank with "drip tray" lid

OIL LEAKAGES ARE COLLECTED ON THE LID FOR EASY OF CLEANING

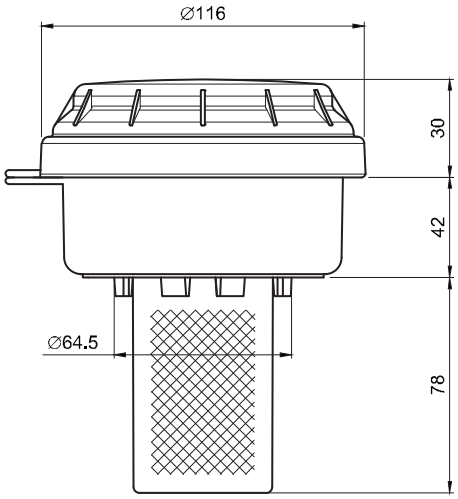
Complete oil tank	Oil tank	Cover	Capacity Lt	A	B	C	D	E	M	O	Q	Cover fix.
DTOT - 12	DT - 12	C - 12	13	339	274	235	1,5	10	208	290	286	6 x M8
DTOT - 16	DT - 16	C - 16	20	414	329	250	1,5	10	270	305	364	6 x M8
DTOT - 30	DT - 30	C - 30	30	474	379	280	1,5	10	312	335	428	6 x M8
DTOT - 55	DT - 55	C - 75	55	604	474	310	2	10	401	365	548	6 x M8
DTOT - 75	DT - 75	C - 75	72	604	474	400	2	10	401	455	548	10 x M8
DTOT - 100	DT - 100	C - 100	98	679	524	450	2,5	10	455	505	625	10 x M8
DTOT - 180	DT - 180	C - 180	160	809	624	500	2,5	10	555	555	755	10 x M8

FBLC- *Lockable, cleanable filler breather*

FBLC

LOCKABLE, CLEANABLE FILLER BREATHER.

- Just one hole (65 mm ±) on tank cover is needed to fix it. No more troubles machining several small fixing holes.
- The 5 µm. filter element can be removed for clearing or replacement.
- Lockable
- Basket can be removed
- Rated air flow 1400 lt/min



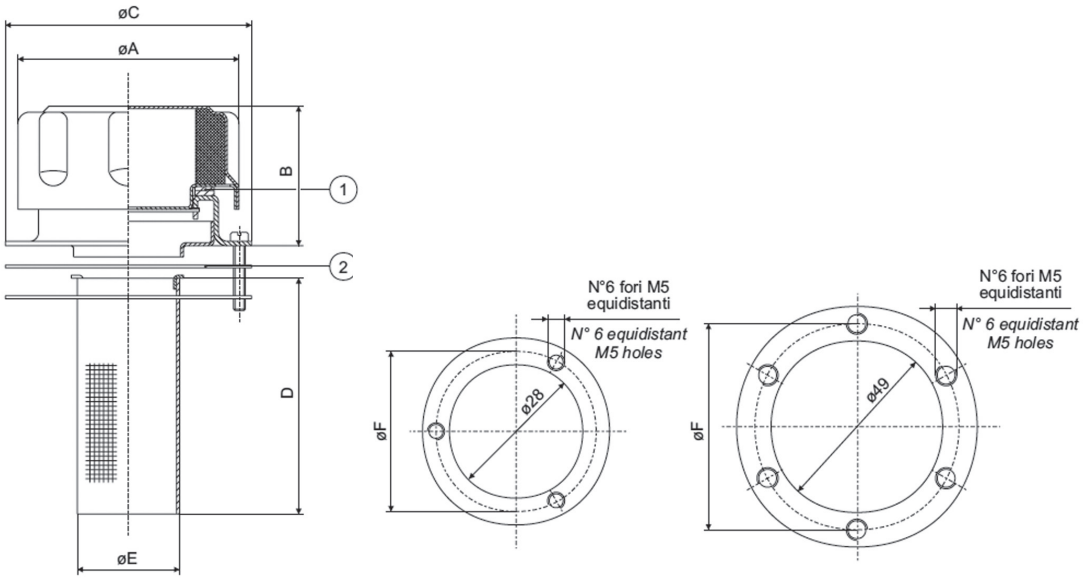
ORDERING CODE

FBLC

FB - *Filler breather*

FB

Filler caps perform a dual function, air filtration at the tank inlet and prefiltration of the fluid by means of the strainer, in order to prevent the ingress of foreign material into the tank during filling and top-up operations.
Correct operation of breather filters makes for longer life of the filter cartridges installed in the hydraulic circuit, and in applications where high level of contamination are present.

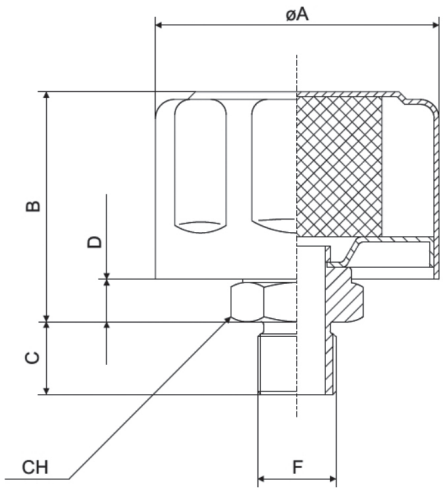


Code	Rated flow	rating	A	B	D	E	E	Weight (Kg)	Screws
FB 1	30m³/min	40 µm	52	48	63	29	111	0.10	n°3 M5x12
FB 2	0.75m³/min	40 µm	83	56	78	50	134	0.30	n°6 M5x12
FB 3	0.75m³/min	40 µm	83	56	148	50	201	0.35	n°6 M5x12

ORDERING CODE

FB1
FB2
FB3

AB - *Air filler breather*



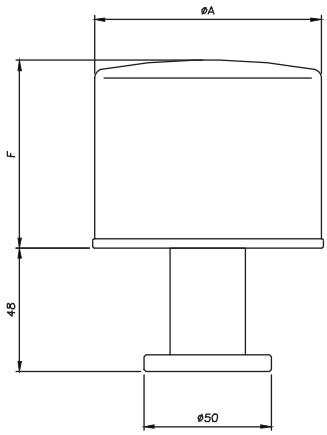
ORDERING CODE

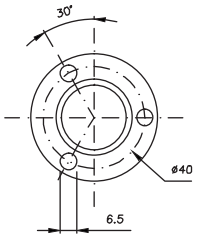
AB1
AB2

Type	Rated Flow	Rating	F BSPP/ NPT	B	D	C	A	Weight (Kg)
AB - 1*	0,30 m³/min	40 µm	¼"	55	7	13	47	0,06
AB - 2*	0,75 m³/min	40 µm	¾"	71	7	16	80	0,20

The function of breather filters is to intercept environmental contamination.
The correct use of breather filters ensures longer life of filter cartridges installed in the hydraulic circuit, and in applications where high level of contamination are present.
The use of breather filters calls for the simultaneous installation of plugs for filling and topping up fluids

ABC - *Filler air breather*





ORDERING CODE

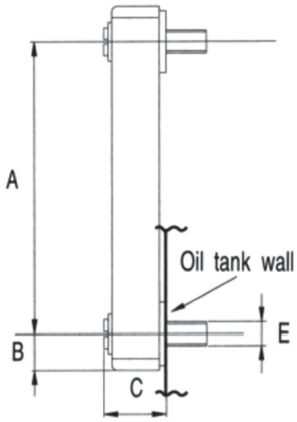
ABC1
ABC2

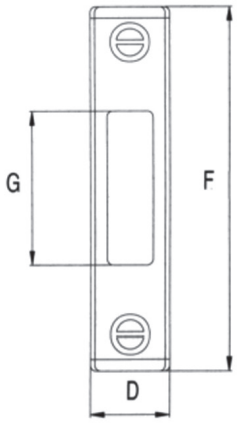
Type	Rated Flow	Rating	A	Weight Kg	Replacement Element
ABC - 1	0,7 m³/min	5µm	96	66	SE - 1
ABC - 2	1,5 m³/min	5µm	96	148	SE - 2

LI - *Level gauge indicators*

LI

Level and temperature gauges
LI level indicator.
LIT level indicator with alcohol thermometer.





Type	A	B	C	D	E	F	G
LI1	76	16	25,2	34,4	M10 / M12	107	37
LI2	127	16	25,2	34,4	M10 / M12	158	82
LI3	254	16	25,2	34,4	M10 / M12	285	209

ORDERING CODE

LI T 1
1 2 3

1 - LI level indicator

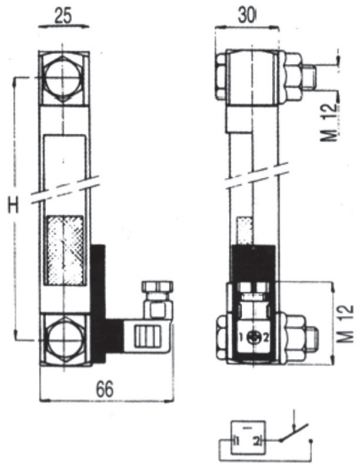
2 - Option
T - with thermoneter
- witout

3 - Size (see table below)

LIE - *Electric Type*

LIE

Electric level indicator: electric contact normally open (N.A.) in "non alarm" position. Electric protection: IP 65. Maximum contact load: alterating current up to 220V (0,5A) Direct current up to 125V (0,3A).

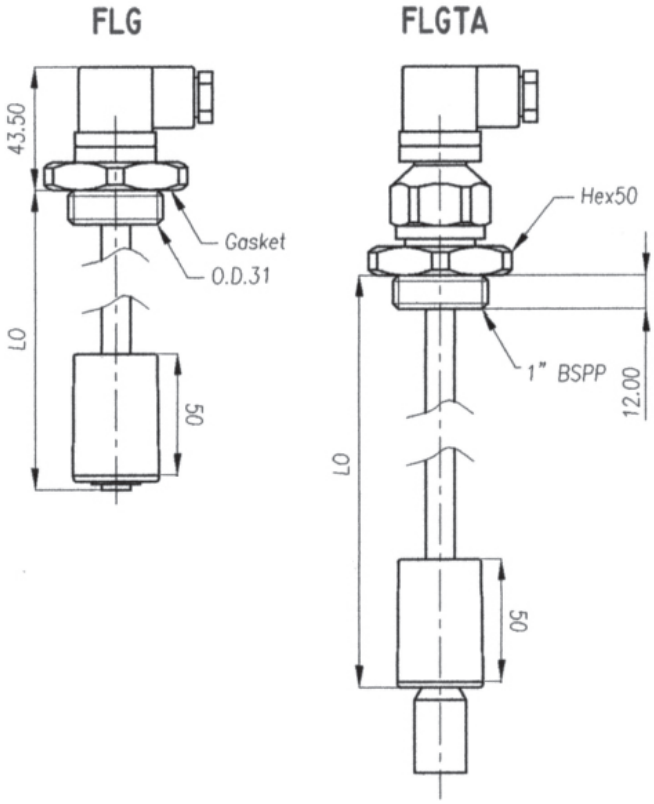


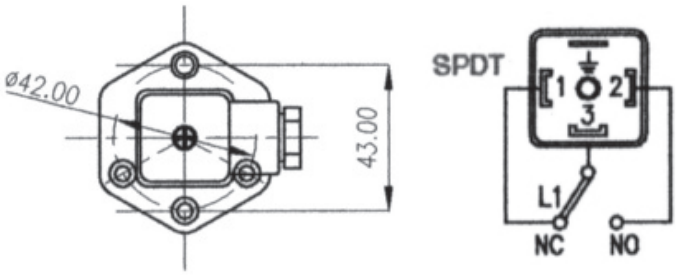
Type	H	Fixing screws	Type of contacts
LIE 2	127 mm	M 12	in exchange
LIE 3	254 mm	M 12	in exchange

ORDERING CODE

LIE 2
LIE 3

FLG - *Floating livel indicators*





FLG

Compatible with minerals oils, oil-water emulsions, diesel and water. Unsinkable floater.
Electric contact hermetically sealed inside the floater rod.
Flanged and screw type fixations both together.

MATERIALS:

Rod: Stainless Steel
Floater: unsinkable rubber

Contacts in exchange:
AC max 48V - 1A
DC max 48V - 0,5 A

Size L0= 100,1 50, 200, 250, 300, 350, 400, 450, and 500 mm.

ORDERING CODE

FLG 100

1 2

1- FLG floating level
FLGT floating level with thermometer

2- Dimension (L0)
0-500

NOTE:

RB Hydraulics S.r.l.
Via Kennedy, 13/15
20100 Boffalora Ticino (MI)
Tel/Fax +39 02 97250475
info@rbhydraulics.eu - www.rbhydraulics.eu

hydraulics

www.rbhydraulics.eu