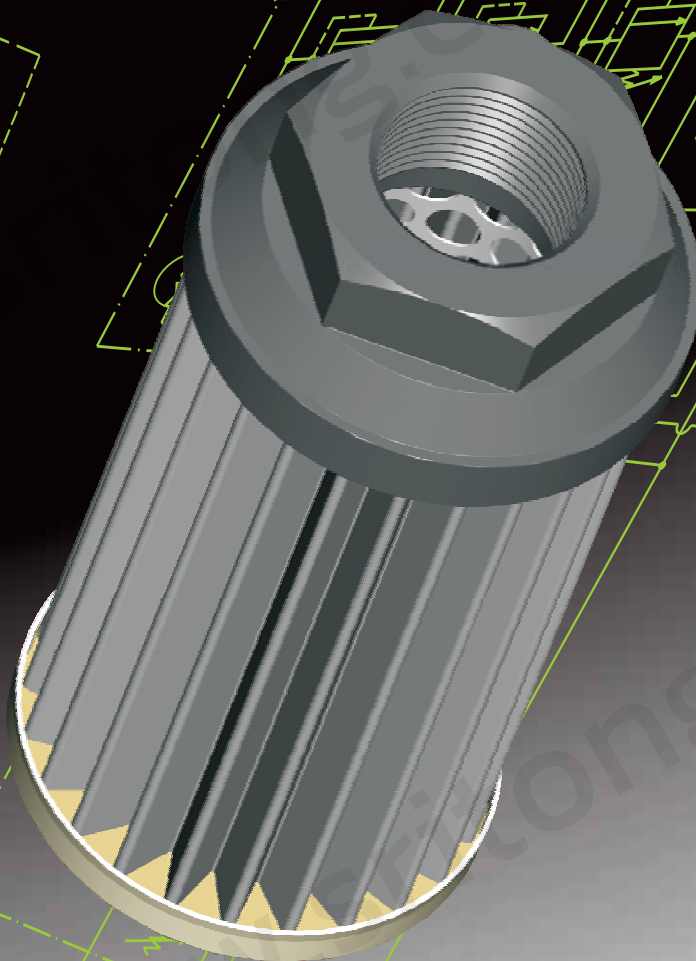


Suction filters

HF 410 / HF 412 series



THE IMPORTANCE OF AN EFFICIENT FILTRATION

The main cause of anomalies in hydraulic systems has to be attributed to the presence of contaminants in the fluid. The nature of the contaminant may be: gaseous, namely air mixed with the fluid; fluid, it depends on water penetrating the fluid; solid, therefore particles of various origins and dimensions.

Customers who operate equipments are always focused on obtaining the best possible performance, lower energy consumptions and greater respect for the environment.

These characteristics can be attained by using top quality components in the hydraulic system for generating and regulating the fluid power, which are also more sensitive to the presence of contaminants in the fluid.

Starting from these requirements, we understand how important and fundamental it is to prevent the presence of air and water from mixing in the fluid tank by using dedicated solutions.

It is also crucial to limit the presence of solid particles in the hydraulic circuit through a suitable filtering system, which is indispensable to maintain the project requirements of the system over time and to keep running costs low.

The correct choice of a filter and its optimum position in the hydraulic system requires the same care and experience needed to choose all the other components.

The use of filters with larger filtering surfaces reduces, at equal flow rates, the superficial contaminant load and therefore the filter's life is extended proportionally.

To maintain the maximum efficiency of the system, the filters must have a clogging indicator showing the differential pressure on the filtering cartridge and to immediately point out when the cartridge needs replacing in order to prevent the by-pass valve from opening.

The following factors should be analysed when choosing the ideal filter:

- The filtration degree required to protect the most sensitive component from contamination
- The points of the circuit in which the filters have to be installed
- The working pressure of the system
- The maximum flow rate and the type of fluid to be filtered
- The duty cycle
- The retention efficiency of the filtering cartridge
- The contaminant accumulation capacity of the filtering cartridge
- The working ambient temperature

Each filter used generates a pressure drop that increases continuously as time goes by. This pressure drop represents an efficiency index of the filter itself.

When the hydraulic system is about to be assembled, all the components must be perfectly clean and the fluid has to be added through a device complete with a filter.

During the test phase, it is advisable to run some work cycles at low pressure in order to create the best possible conditions for all the components.

TECHNICAL CHARACTERISTICS

The HF 410 and HF 412 suction line filters series are directly connected to the circuit's suction line and protect the system's components against contaminant particles.

The filters can be supplied with by-pass valve set at 2.9 psi (0,2 bar).

In the 10-20-30 dimensions, the HF 412 serie is made with an outside diameter smaller than the relative HF 410 versions.

- Flow up to 80 US gpm (300 l/min)
- By-pass valve
- "FS" version with oversized filtering surface

MATERIALS

Head	Reinforced nylon
End cap	Zinc plated steel
Inner tube	Zinc plated steel
Filter media	Steel wire mesh
	Stainless steel wire mesh

FLUID COMPATIBILITY

Conforming to ISO 2943 (Norm ISO 6743/4)

Oil mineral	HH - HL - HM - HR - HV - HG
Water emulsion	HFAE - HFAS
Water glycol	HFC
Syntetic fluid	HS - HFDR - HFDU - HFDS

FLOW

Flow max.	80 US gpm (300 l/min)
-----------	-----------------------

PRESSURE

Element collapse pressure rating (conforming to ISO 2941)	14.50 psi (1 bar)
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BY-PASS VALVE

By-pass setting	2.90 psi (0,2 bar)
-----------------	--------------------

OPERATING TEMPERATURE

-22 ÷ 195 °F (-30 ÷ 90 °C)

DEGREE OF FILTRATION

Code	Material	Degree of filtration
MI025	Stainless steel wire mesh	25 µm
MI060	Stainless steel wire mesh	60 µm
MS090	Steel wire mesh	90 µm
MI125	Stainless steel wire mesh	125 µm
MI250	Stainless steel wire mesh	250 µm

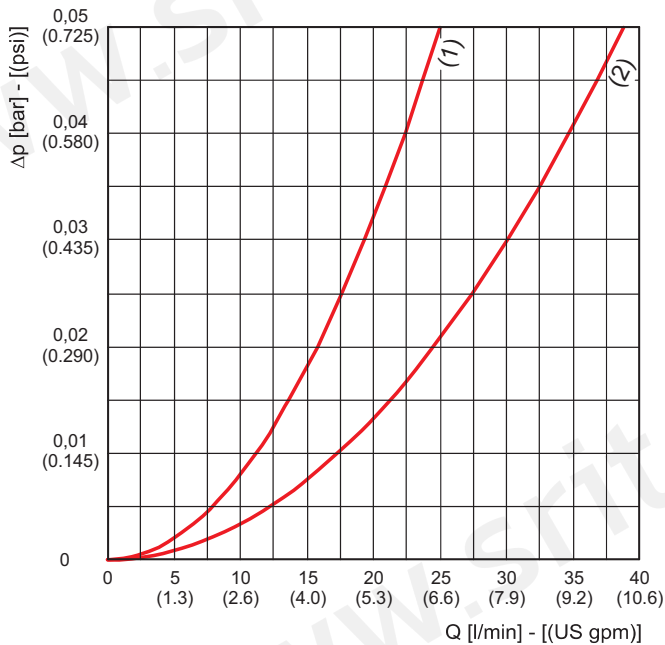
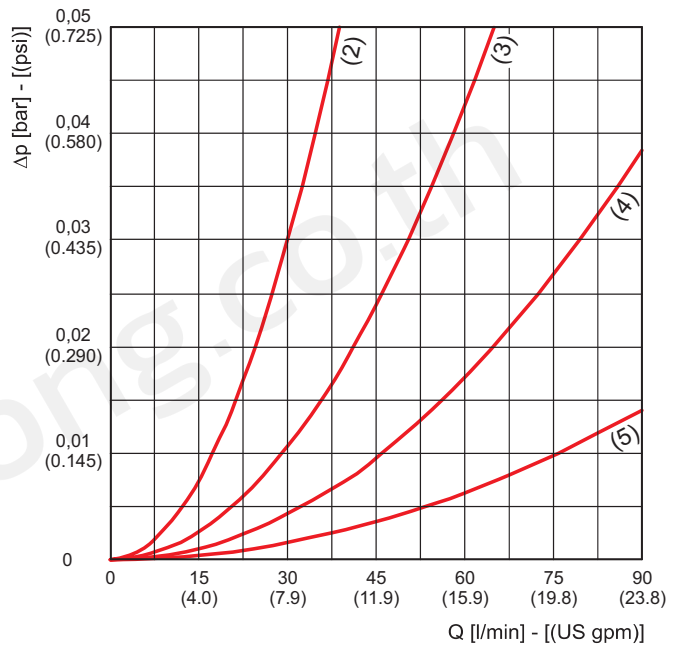
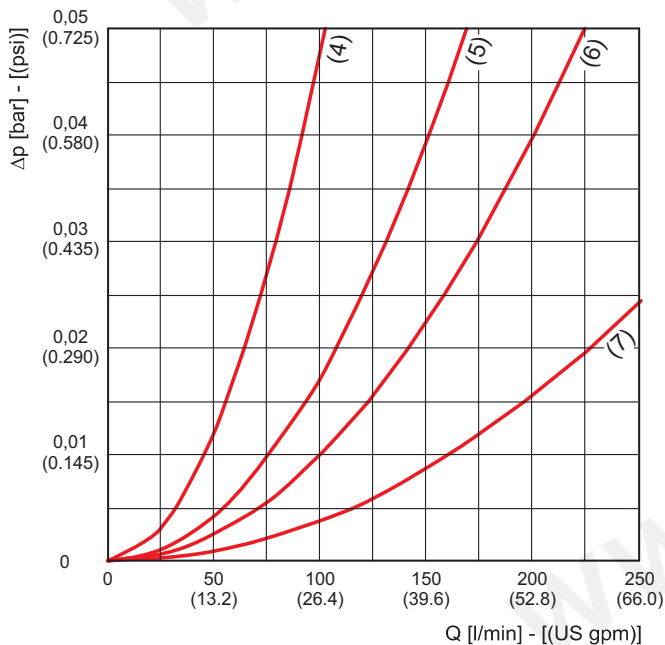
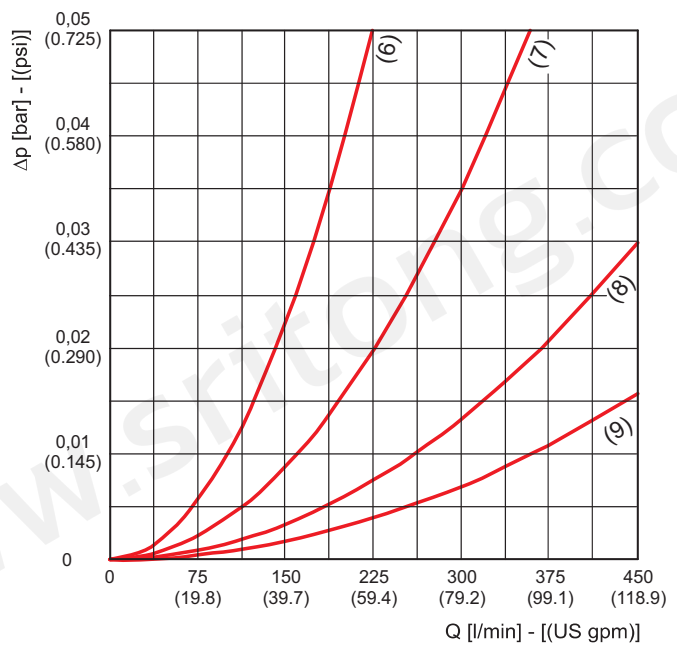
01/05.2011

PRESSURE DROP CURVES IN THE CONNECTION THREADS

The curves are obtained in the following conditions:
Mineral oil type ISO VG46
Kinematic viscosity 120 SSU (30 cSt)
Density 7.29 lb/gal (0,856 kg/dm³).

- | | | |
|-----------|-------------|-------------|
| (1) G 3/8 | (4) G 1 | (7) G 2 |
| (2) G 1/2 | (5) G 1 1/4 | (8) G 2 1/2 |
| (3) G 3/4 | (6) G 1 1/2 | (9) G 3 |

Please refer to nominal flows rates at page 3 and page 4 for a correct dimensional selection of the filters.

HF410-10 / HF412-10

HF410-20 / HF412-20

HF410-30 / HF412-30

HF410-40


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NOMINAL FLOWS

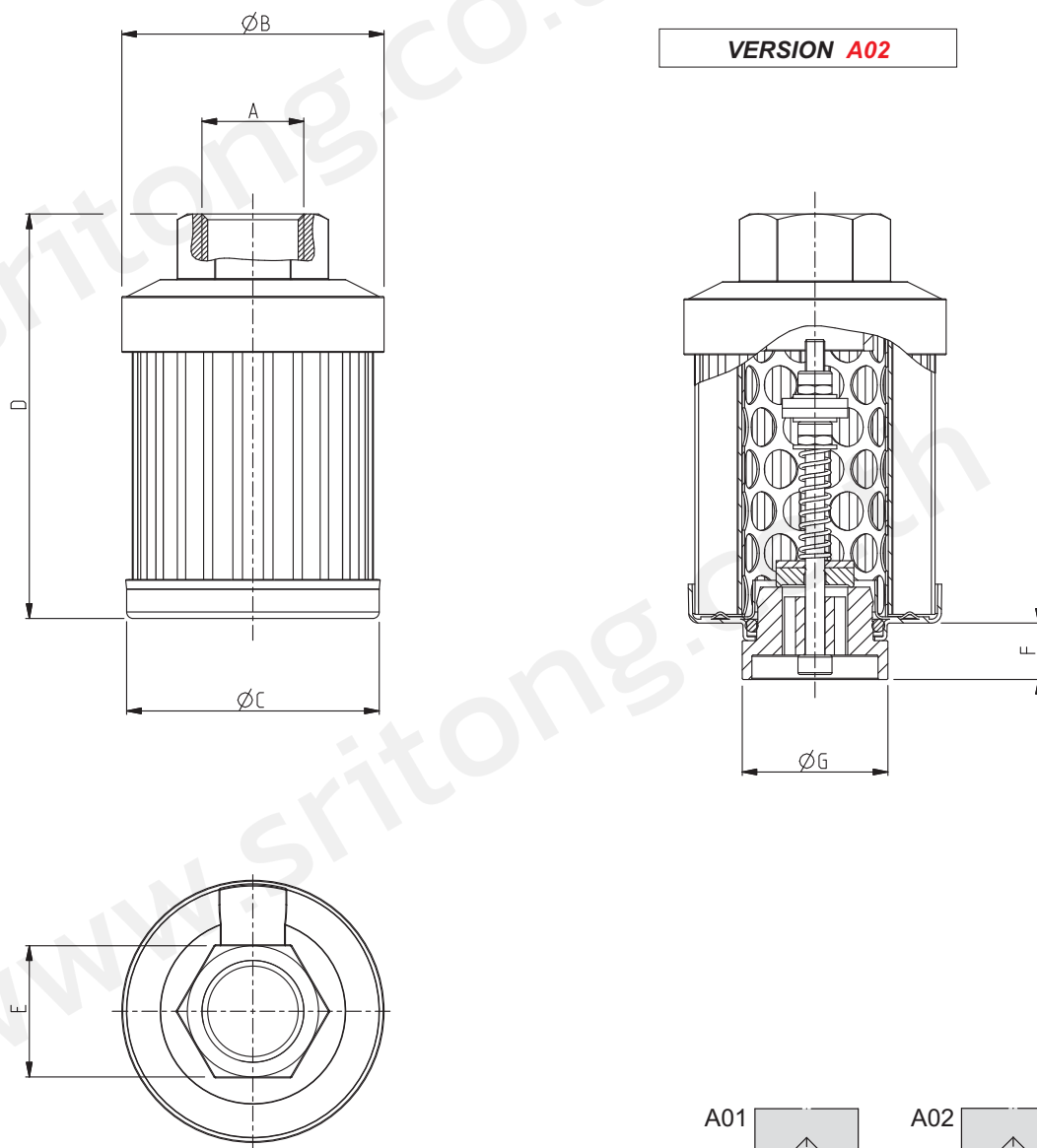
Filter type	Ports GAS (BSPP)	Degree of filtration				
		MI025	MI060	MS090	MI125	MI250
		Nominal Flow ("AS" version values)				
		US gpm (l/min)				
HF 410-10.060	G 3/8	1.3 (5)	2.6 (10)	4.0 (15)	4.0 (15)	4.0 (15)
	G 1/2	4.0 (15)	5.3 (20)	6.6 (25)	6.6 (25)	6.6 (25)
HF 410-20.077	G 1/2	4.0 (15)	5.3 (20)	6.6 (25)	6.6 (25)	6.6 (25)
	G 3/4	5.3 (20)	6.6 (25)	7.9 (30)	7.9 (30)	7.9 (30)
	G 1	6.6 (25)	7.9 (30)	10.6 (40)	10.6 (40)	10.6 (40)
HF 410-20.122	G 1 1/4	7.9 (30)	11.9 (45)	14.5 (55)	14.5 (55)	14.5 (55)
	G 1/2	5.3 (20)	6.6 (25)	7.9 (30)	7.9 (30)	7.9 (30)
	G 3/4	6.6 (25)	7.9 (30)	9.2 (35)	9.2 (35)	9.2 (35)
	G 1	7.9 (30)	9.2 (35)	11.9 (45)	11.9 (45)	11.9 (45)
HF 410-30.077	G 1 1/4	9.2 (35)	13.2 (50)	15.9 (60)	15.9 (60)	15.9 (60)
	G 1	6.6 (25)	7.9 (30)	10.6 (40)	10.6 (40)	10.6 (40)
	G 1 1/4	7.9 (30)	11.9 (45)	14.5 (55)	14.5 (55)	14.5 (55)
	G 1 1/2	9.2 (35)	13.2 (50)	15.9 (60)	15.9 (60)	15.9 (60)
HF 410-30.122	G 2	10.6 (40)	14.5 (55)	18.5 (70)	18.5 (70)	18.5 (70)
	G 1	9.2 (35)	13.2 (50)	15.9 (60)	15.9 (60)	15.9 (60)
	G 1 1/4	11.9 (45)	15.9 (60)	19.8 (75)	19.8 (75)	19.8 (75)
	G 1 1/2	13.2 (50)	17.2 (65)	21.1 (80)	21.1 (80)	21.1 (80)
HF 410-30.162	G 2	14.5 (55)	18.5 (70)	23.8 (90)	23.8 (90)	23.8 (90)
	G 1	14.5 (55)	18.5 (70)	23.8 (90)	23.8 (90)	23.8 (90)
	G 1 1/4	15.9 (60)	22.5 (85)	27.7 (105)	27.7 (105)	27.7 (105)
	G 1 1/2	17.2 (65)	23.8 (90)	29.0 (110)	29.0 (110)	29.0 (110)
HF 410-30.195	G 2	18.5 (70)	25.1 (95)	31.7 (120)	31.7 (120)	31.7 (120)
	G 1	17.2 (65)	23.8 (90)	29.0 (110)	29.0 (110)	29.0 (110)
	G 1 1/4	19.8 (75)	26.4 (100)	33.0 (125)	33.0 (125)	33.0 (125)
	G 1 1/2	21.1 (80)	27.7 (105)	34.3 (130)	34.3 (130)	34.3 (130)
HF 410-40.077	G 2	22.5 (85)	29.0 (110)	37.0 (140)	37.0 (140)	37.0 (140)
	G 1 1/2	14.5 (55)	18.5 (70)	23.8 (90)	23.8 (90)	23.8 (90)
	G 2	17.2 (65)	23.8 (90)	29.0 (110)	29.0 (110)	29.0 (110)
	G 2 1/2	19.8 (75)	26.4 (100)	33.0 (125)	33.0 (125)	33.0 (125)
HF 410-40.122	G 3	22.5 (85)	29.0 (110)	37.0 (140)	37.0 (140)	37.0 (140)
	G 1 1/2	21.1 (80)	27.7 (105)	34.3 (130)	34.3 (130)	34.3 (130)
	G 2	23.8 (90)	31.7 (120)	39.7 (150)	39.7 (150)	39.7 (150)
	G 2 1/2	26.4 (100)	34.3 (130)	43.8 (165)	43.8 (165)	43.8 (165)
HF 410-40.162	G 3	29.0 (110)	38.3 (145)	47.6 (180)	47.6 (180)	47.6 (180)
	G 1 1/2	26.4 (100)	35.7 (135)	44.9 (170)	44.9 (170)	44.9 (170)
	G 2	30.4 (115)	39.7 (150)	50.2 (190)	50.2 (190)	50.2 (190)
	G 2 1/2	33.0 (125)	43.8 (165)	54.2 (205)	54.2 (205)	54.2 (205)
HF 410-40.195	G 3	34.3 (130)	46.2 (175)	58.1 (220)	58.1 (220)	58.1 (220)
	G 1 1/2	33.0 (125)	44.9 (170)	55.5 (210)	55.5 (210)	55.5 (210)
	G 2	37.0 (140)	48.9 (185)	60.8 (230)	60.8 (230)	60.8 (230)
	G 2 1/2	38.3 (145)	51.5 (195)	64.7 (245)	64.7 (245)	64.7 (245)
HF 410-40.239	G 3	40.9 (155)	55.5 (210)	68.7 (260)	68.7 (260)	68.7 (260)
	G 1 1/2	39.7 (150)	52.9 (200)	66.0 (250)	66.0 (250)	66.0 (250)
	G 2	42.3 (160)	56.8 (215)	71.3 (270)	71.3 (270)	71.3 (270)
	G 2 1/2	44.9 (170)	60.8 (230)	75.3 (285)	75.3 (285)	75.3 (285)
	G 3	47.6 (180)	63.4 (240)	79.3 (300)	79.3 (300)	79.3 (300)

01/05.2011

NOMINAL FLOWS

Filter type	Ports GAS (BSPP)	Degree of filtration				
		MI025	MI060	MS090	MI125	MI250
		Nominal Flow ("AS" version values)				
		US gpm (l/min)				
HF 412-10.075	G 3/8	1.3 (5)	2.6 (10)	4.0 (15)	4.0 (15)	4.0 (15)
	G 1/2	2.6 (10)	4.0 (15)	5.3 (20)	5.3 (20)	5.3 (20)
HF 412-10.090	G 3/8	1.3 (5)	4.0 (15)	5.3 (20)	5.3 (20)	5.3 (20)
	G 1/2	4.0 (15)	5.3 (20)	6.6 (25)	6.6 (25)	6.6 (25)
HF 412-20.090	G 3/4	5.3 (20)	6.6 (25)	7.9 (30)	7.9 (30)	7.9 (30)
	G 1	6.6 (25)	7.9 (30)	10.6 (40)	10.6 (40)	10.6 (40)
HF 412-20.120	G 3/4	6.6 (25)	7.9 (30)	9.2 (35)	9.2 (35)	9.2 (35)
	G 1	7.9 (30)	9.2 (35)	11.9 (45)	11.9 (45)	11.9 (45)
HF 412-30.120	G 1	9.2 (35)	13.2 (50)	15.9 (60)	15.9 (60)	15.9 (60)
	G 1 1/4	11.9 (45)	15.9 (60)	19.8 (75)	19.8 (75)	19.8 (75)
	G 1 1/2	13.2 (50)	17.2 (65)	21.1 (80)	21.1 (80)	21.1 (80)
	G 2	14.5 (55)	18.5 (70)	23.8 (90)	23.8 (90)	23.8 (90)
HF 412-30.181	G 1	14.5 (55)	18.5 (70)	23.8 (90)	23.8 (90)	23.8 (90)
	G 1 1/4	15.9 (60)	22.5 (85)	27.7 (105)	27.7 (105)	27.7 (105)
	G 1 1/2	17.2 (65)	23.8 (90)	29.0 (110)	29.0 (110)	29.0 (110)
	G 2	18.5 (70)	25.1 (95)	31.7 (120)	31.7 (120)	31.7 (120)
HF 412-30.241	G 1	17.2 (65)	23.8 (90)	29.0 (110)	29.0 (110)	29.0 (110)
	G 1 1/4	19.8 (75)	26.4 (100)	33.0 (125)	33.0 (125)	33.0 (125)
	G 1 1/2	21.1 (80)	27.7 (105)	34.3 (130)	34.3 (130)	34.3 (130)
	G 2	22.5 (85)	29.0 (110)	37.0 (140)	37.0 (140)	37.0 (140)

HF410-10 DIMENSION



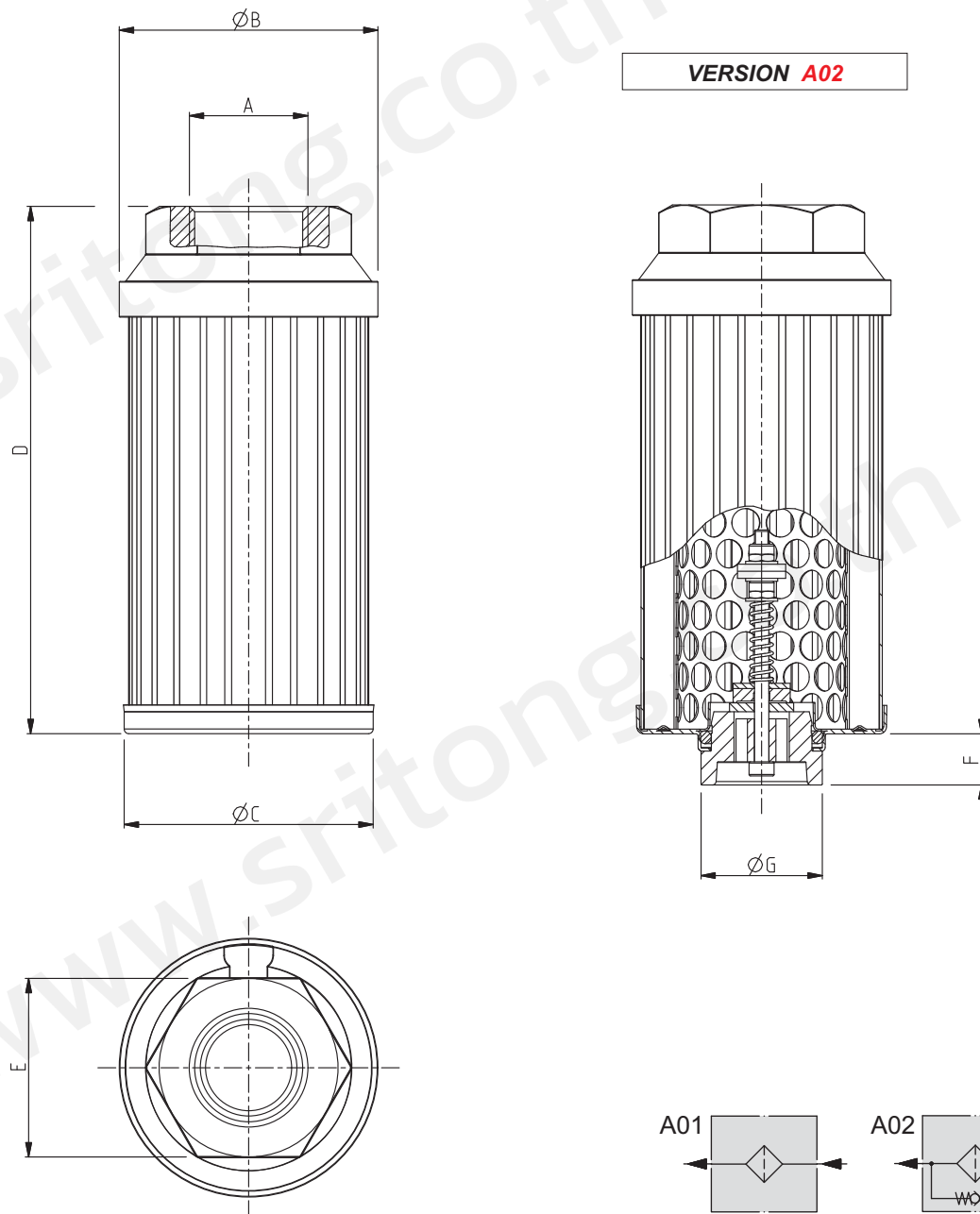
ICAT_004_001_HF410

01/05.2011

Filter type	Weight	A (Thread GAS-BSP)		ØB	ØC	D	E	F	G
	kg (lbs)	Standard	On request	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
HF 410-10.060	0,10 (0.22)	G 3/8	G 1/2	54 (2.1259)	52 (2.0472)	84 (3.3070)	27 (1.0629)	12 (0.4724)	30 (1.1810)

NPT threads are available (consult our technical department).

HF410-20 DIMENSION



ICAT_004_002_HF410

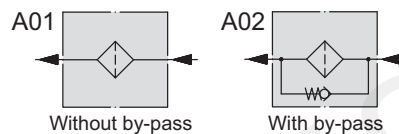
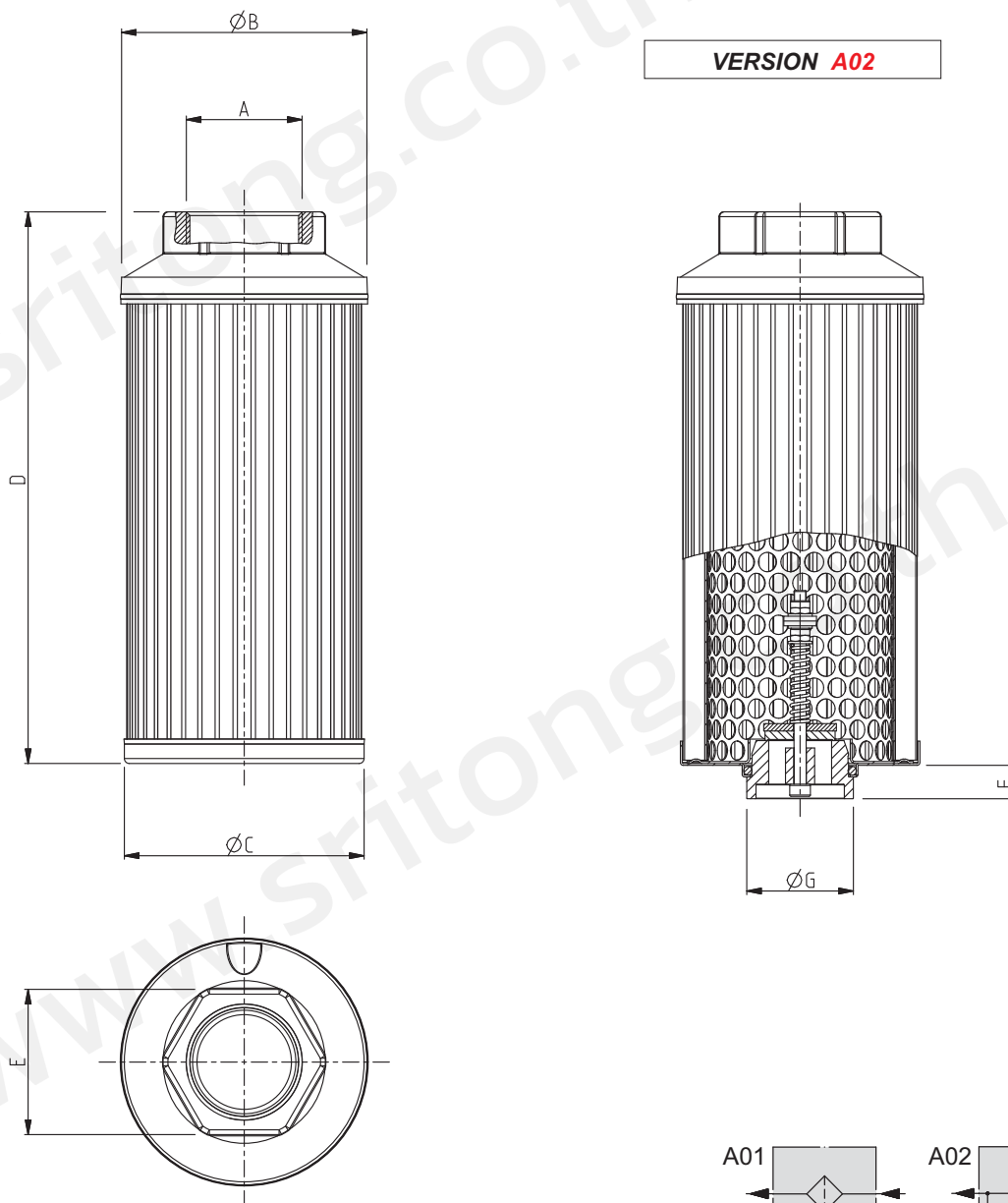
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Filter type	Weight	A (Thread GAS-BSPP)		ØB	ØC	D	E	F	G
	kg (lbs)	Standard	On request						
HF 410-20.077	0,20 (0.44)	G 1/2	G 3/4 - G 1 - G 1 1/4	72,5 (2.8543)	70 (2.7558)	104 (4.0944)	34 (1.3385)	14 (0.5511)	34 (1.3385)
	0,25 (0.55)	G 3/4	G 1/2 - G 1 - G 1 1/4			148 (5.8267)	(50*) (1.9684)		

NPT threads are available (consult our technical department).

(*) Only version with A= G 1 - G 1 1/4.

HF410-30 DIMENSION

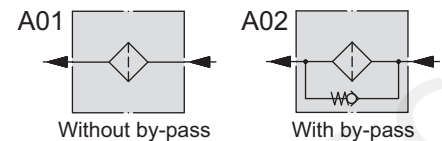
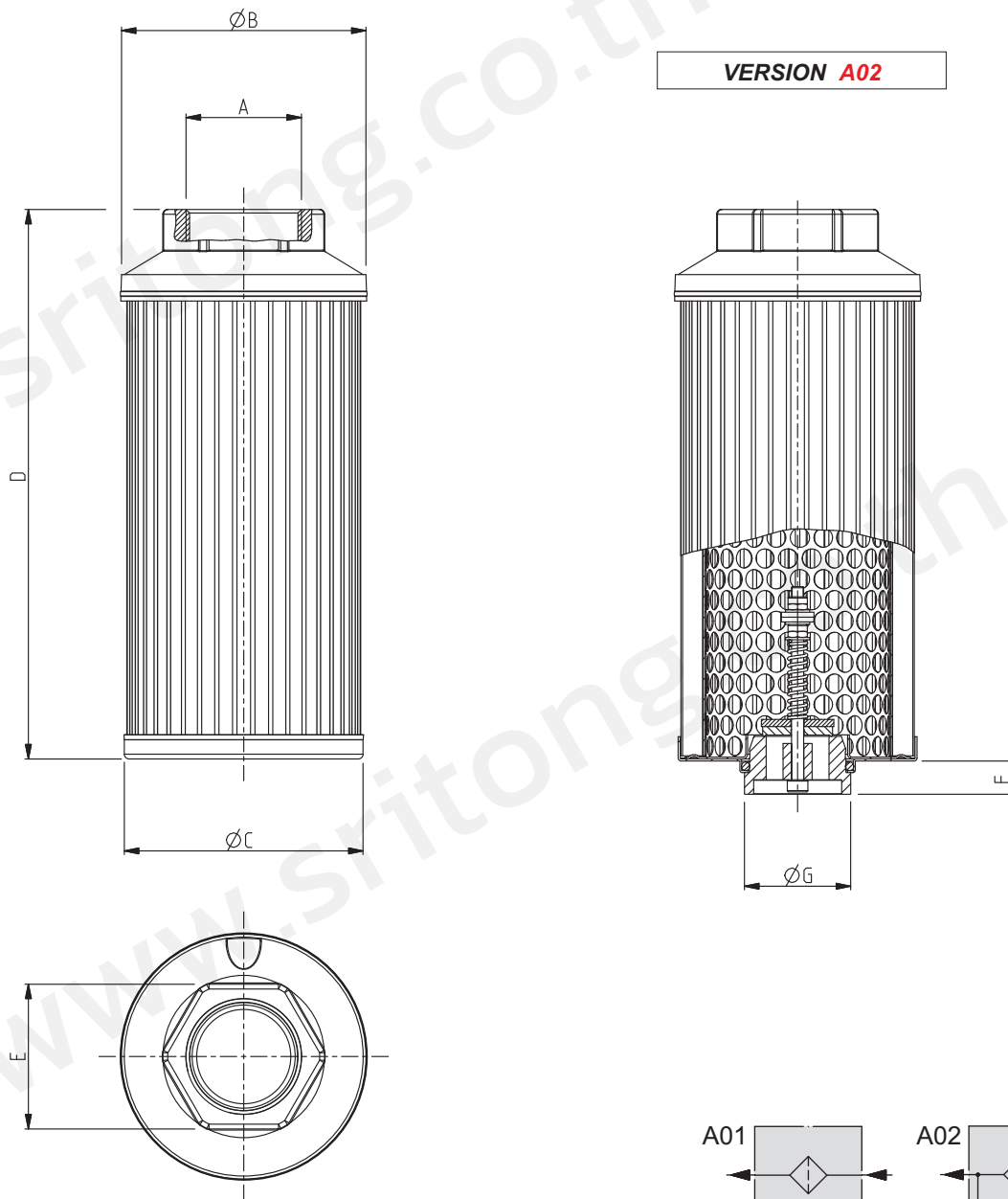


Filter type	Weight		A (Thread GAS-BSPP)		ØB	ØC	D	E	F	G
	kg (lbs)		Standard	On request	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
HF 410-30.077	0,35 (0.77)		G 1	G 1 1/4 - G 1 1/2 - G 2			110 (4.3306)			
HF 410-30.122	0,40 (0.88)						155 (6.1023)	60 (2.3621)		
HF 410-30.162	0,45 (0.99)		G 1 1/4	G 1 - G 1 1/2 - G 2	102 (4.0157)	99 (3.8976)	195 (7.6771)	(70*) (2.7558)	14 (0.551)	44 (1.7322)
HF 410-30.195	0,50 (1.10)		G 1 1/2	G 1 - G 1 1/4 - G 2			228 (8.9763)			

NPT threads are available (consult our technical department).

(*) Only version with A= G 2.

HF 410-40 DIMENSION



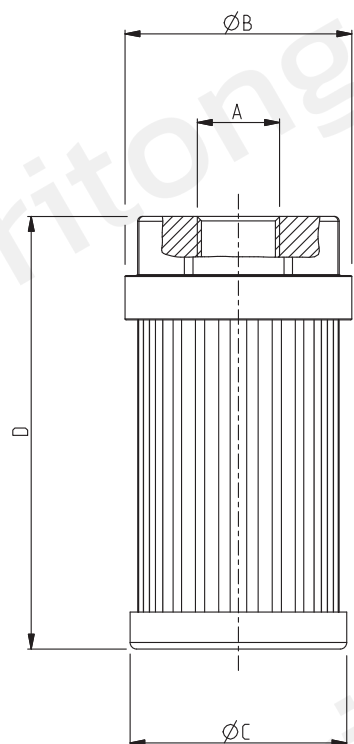
ICAT_004_003_HF410

Filter type	Weight		A (Thread GAS-BSPP)		$\varnothing B$	$\varnothing C$	D	E	F	G
	kg (lbs)		standard	On request	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
HF 410-40.077	0,80 (1.76)						117 (4.6062)			
HF 410-40.122	0,85 (1.87)						162 (6.3779)			
HF 410-40.162	1,00 (2.20)	G 2	G 1 1/2 - G 2 1/2 - G 3		132,5 (5.2165)	130 (5.1180)	202 (7.9527)	100 (3.9369)	14 (0.5511)	73 (2.8740)
HF 410-40.195	1,15 (2.53)						235 (9.2519)			
HF 410-40.239	1,35 (2.97)						278 (10.9448)			

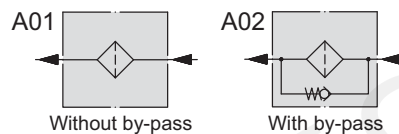
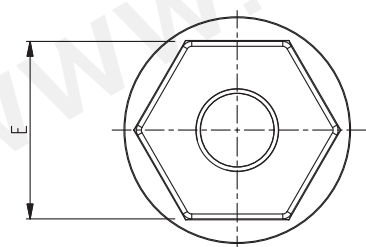
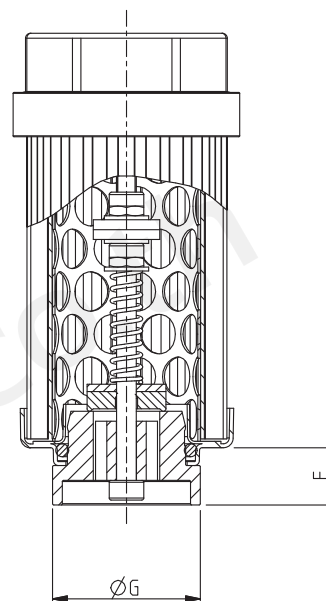
NPT threads are available (consult our technical department).

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HF412-10 DIMENSION



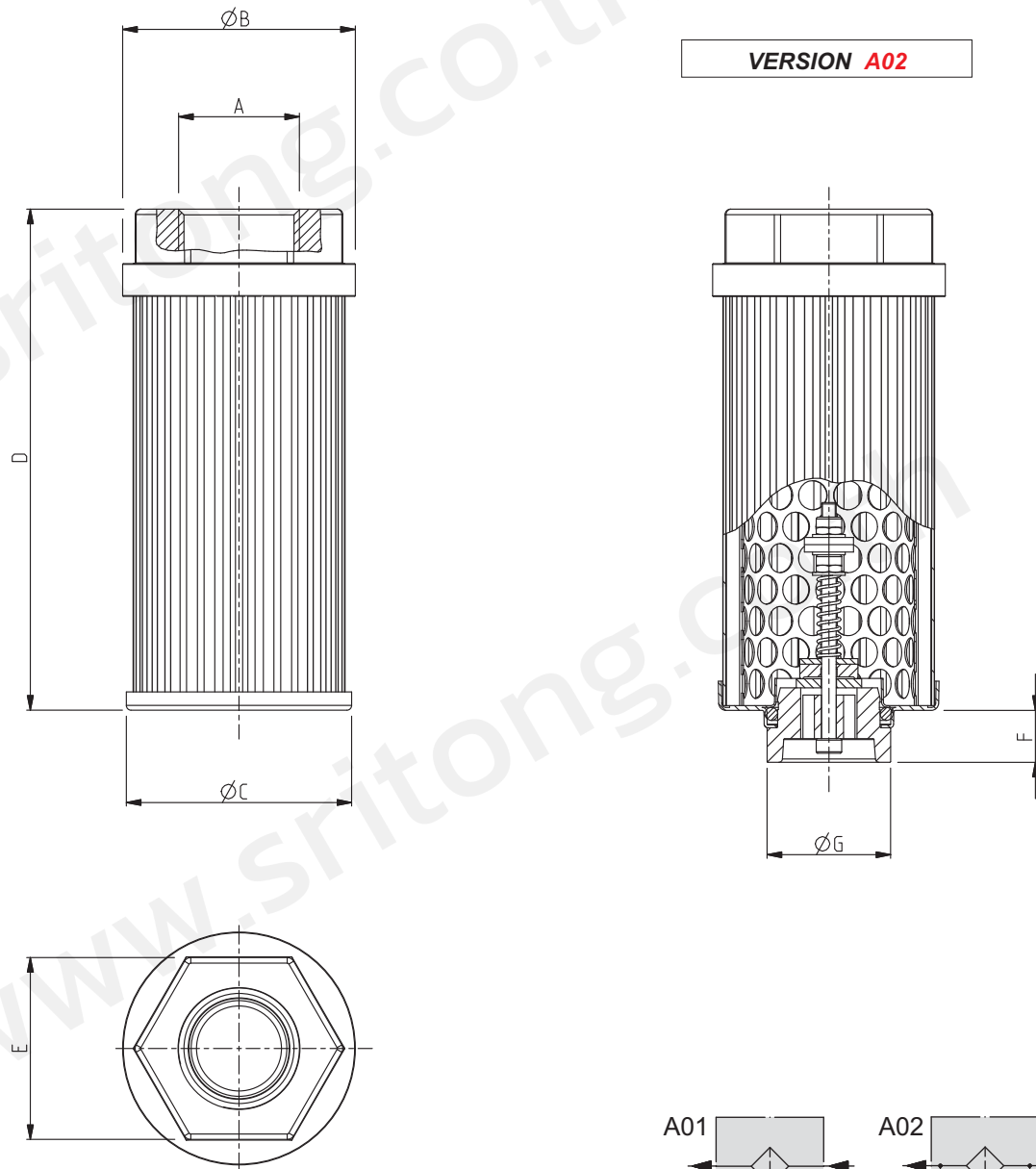
VERSION **A02**



Filter type	Weight	A (Thread GAS-BSPP)		ØB	ØC	D	E	F	ØG
	kg (lbs)	Standard	On request	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
HF 412-10.075	0,10 (0.22)	G 3/8	G 1/2	46	44	90 (3.5432)	36	12	30
				(1.8110)	(1.7322)		(1.4173)	(0.4724)	(1.1810)
HF 412-10.090	0,15 (0.33)	G 1/2	G 3/8			105 (4.1338)			

NPT threads are available (consult our technical department).

HF412-20 DIMENSION



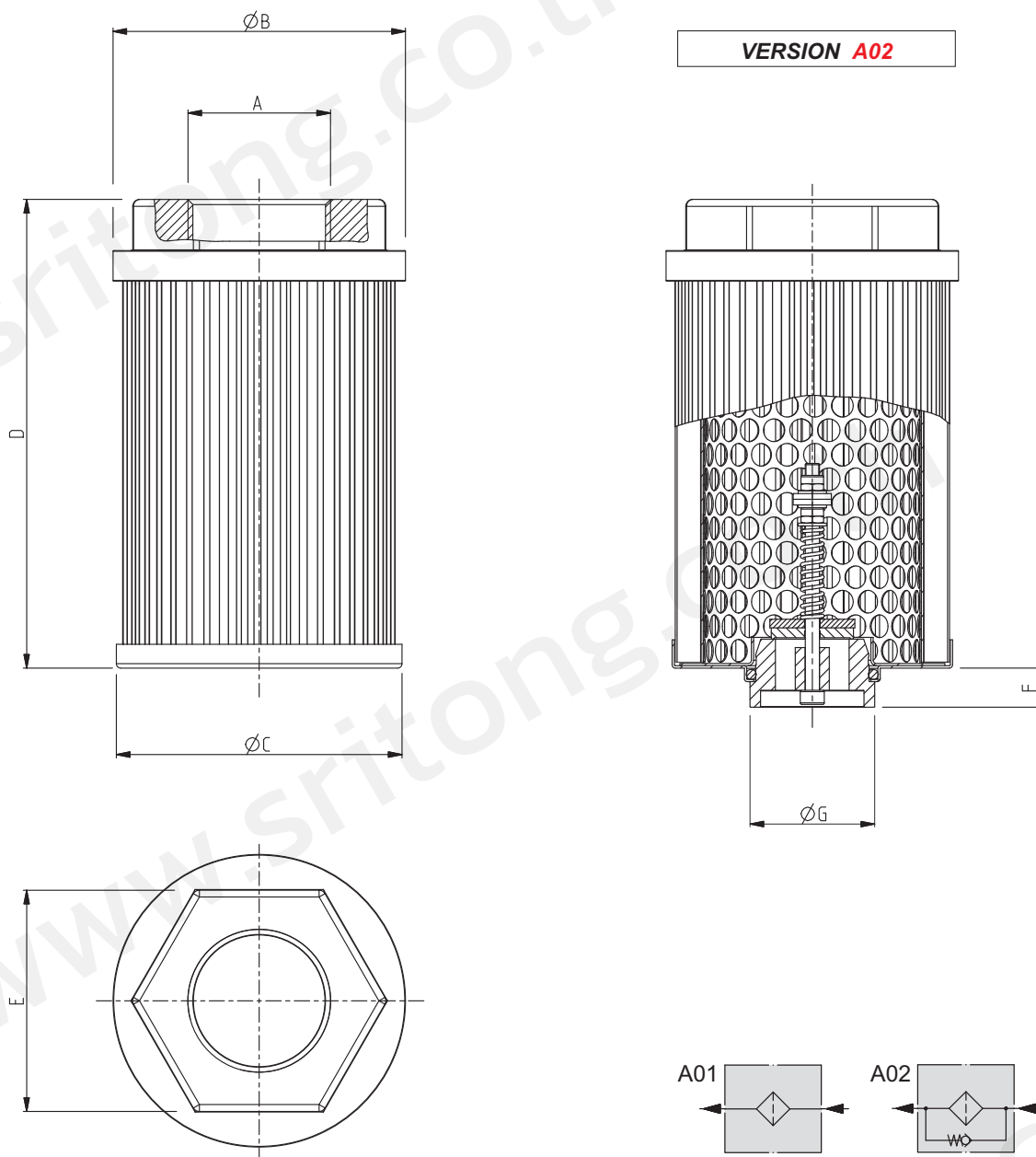
ICAT_004_006_HF410

01/05.2011

Filter type	Weight	A (Thread GAS-BSP)		ØB	ØC	D	E	F	ØG
	kg (lbs)	Standard	On request	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
HF 412-20.090	0,20 (0.44)	G 3/4	G 1	64	62	109 (4.2913)	50	14	34
				(2.5196)	(2.4409)		(1.9684)	(0.5511)	(1.3385)
HF 412-20.120	0,25 (0.55)	G 1	G 3/4			139 (5.4724)			

NPT threads are available (consult our technical department).

HF412-30 DIMENSION



ICAT_004_007_HF410

01/05.2011

Filter type	Weight	A (Thread GAS-BSPP)		ØB	ØC	D	E	F	ØG
	kg (lbs)	Standard	On request	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
HF 412-30.120	0,40 (0.88)	G 1	G 1 1/4 - G 1 1/2 - G 2			139 (5.4724)	65 (2.5590)		
HF 412-30.181	0,45 (0.99)	G 1 1/2	G 1 - G 1 1/4 - G 2	86 (3.3858)	84 (3.3070)	200 (7.8739)		14 (0.5511)	44 (1.7322)
HF 412-30.241	0,50 (1.10)	G 2	G 1 - G 1 1/4 - G 1 1/2			260 (10.2361)	75 (2.9527)		

NPT threads are available (consult our technical department).

FILTERING SURFACES

Filter type	Standard filtering surface (AS)	Oversize filtering surface (FS)
	cm ² (in ²)	cm ² (in ²)
HF 410-10.060	290 (44.9500)	370 (57.3501)
HF 410-20.077	370 (57.3501)	490 (75.9501)
HF 410-20.122	585 (90.6751)	780 (120.9002)
HF 410-30.077	525 (81.3751)	680 (105.4002)
HF 410-30.122	830 (128.6503)	1075 (166.6253)
HF 410-30.162	1295 (200.7254)	1425 (220.8754)
HF 410-30.195	1560 (241.8005)	1870 (289.8506)
HF 410-40.077	955 (148.0253)	1260 (195.3004)
HF 410-40.122	1515 (234.8255)	2000 (310.0006)
HF 410-40.162	2010 (311.5506)	2655 (411.5258)
HF 410-40.195	2420 (375.1008)	3200 (496.001)
HF 410-40.239	3970 (615.3512)	5260 (815.3016)
HF 412-10.075	285 (44.1750)	360 (55.8001)
HF 412-10.090	345 (53.4751)	430 (66.6501)
HF 412-20.090	430 (66.6501)	560 (86.8001)
HF 412-20.120	575 (89.1251)	750 (116.2502)
HF 412-30.120	835 (129.4253)	1035 (160.4253)
HF 412-30.181	1260 (195.3004)	1564 (242.4205)
HF 412-30.241	1675 (259.6255)	2080 (322.4006)

01/05.2011

HF410 CONNECTION THREADS

Filter type	PORTS TYPE	
	Nominal size	Gas BSPP
HF 410-10	3/8"	GC
	1/2"	GD
HF 410-20	1/2"	GD
	3/4"	GE
	1"	GF
	1" 1/4	GG
	1"	GF
HF 410-30	1" 1/4	GG
	1" 1/2	GH
	2"	GL
HF 410-40	1" 1/2	GH
	2"	GL
	2" 1/2	GM
	3"	GN

HF412 CONNECTION THREADS

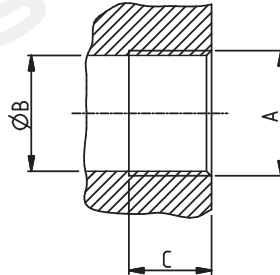
Filter type	PORTS TYPE	
	Nominal size	Gas BSPP
HF 412-10	3/8"	GC
	1/2"	GD
HF 412-20	3/4"	GE
	1"	GF
	1"	GF
HF 412-30	1" 1/4	GG
	1" 1/2	GH
	2"	GL

01/05.2011

GAS THREAD
BSPP

Cylindrical GAS thread (55°) in accordance with UNI - ISO 228

ICAT_011_008_HF760



CODE	Nominal dimension	A	Ø B	C
			mm (in)	mm (in)
GC	3/8"	G 3/8	15 (0.5906)	14 (0.5511)
GD	1/2"	G 1/2	19 (0.7480)	17 (0.6692)
GE	3/4"	G 3/4	24,5 (0.9646)	20 (0.7873)
GF	1"	G 1	30,5 (1.2008)	22 (0.8661)
GG	1"1/4	G 1 1/4	39 (1.5354)	24 (0.9448)
GH	1"1/2	G 1 1/2	45 (1.7716)	26 (1.0236)
GL	2"	G 2	57 (2.2440)	32 (1.2598)
GM	2"1/2	G 2 1/2	72,5 (2.8543)	32 (1.2598)
GN	3"	G 3	85 (3.3464)	32 (1.2598)

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ASSEMBLY AND FILTER SUBSTITUTION INSTRUCTIONS

ASSEMBLY

Once you have checked the integrity of the filter inside its package, proceed as follows:

- A Screw the filter on the male junction until getting the attainment of a reassuring filtering torque, possibly using anti unscrewing devices.
- B Make sure that the liquid's minimum level in the tank totally covers the filters, in both static and dynamic work situations.
- C Make sure that the machine works normally, always verifying the depression level through an eventual indicator put on the suction line.
- D We suggest the filter's horizontal position to considerably reduce the oil's minimum level.

FILTER SUBSTITUTION

Once the working hour limit indicated in the maintenance instructions of the system has been reached, or when the suction line's clogging indicators reach the maximum depression's limit established, the filter needs to be substituted taking care of the eventual oil leaks due to this operation. So it is advisable to hold containers for the collection. Proceed as follows:

- A Stop the system in "Machine stopped" status.
- B Secure any shut-off valves on the hydraulic circuit.
- C Take the filter off from the tank.
- D Unscrew the filter.
- E Proceed following the assembly instructions.
- F Restart the machine.
- G Make sure that the machine works normally, always verifying the depression level through an eventual indicator put on the suction line.



HOW TO ORDER A COMPLETE FILTER

	1	2	3	4	5
HF410	-	10.060	-	AS	-
HF412	-	10.060	-	AS	-
				MS090	-
				GD	-
					A01

1	Filter type	CODE
	See table from pag. 5 to pag. 8	HF410-
	See table from pag. 9 to pag. 11	HF412-
2	Filtering surface	CODE
	Standard	AS
	Oversized	FS
3	Degree of filtration	CODE
	25 [µm] Stainless steel wire mesh	MI025
	60 [µm] Stainless steel wire mesh	MI060
	90 [µm] Steel wire mesh	MS090
	125[µm] Stainless steel wire mesh	MI125
	250[µm] Stainless steel wire mesh	MI250

4	Inlet port	CODE
	Thread GAS (BSPP)	
	G 3/8	GC
	G 1/2	GD
	G 3/4	GE
	G 1	GF
	G 1 1/4	GG
	G 1 1/2	GH
	G 2	GL
	G 2 1/2	GM
	G 3	GN

*In case of NPT inlet port, substitute letter G in the code to letter N.
(ex. thread 1" NPT = NF).

5	Optionals	CODE
	None (standard)	A01
	With By-pass	A02

☒ Standard
☐ On request

Building &
construction

Agriculture

Truck
Market

Material
Handling

Industrial



Full range of filters
for all hydraulic circuits

Suction filters

HF 410
HF 412
HF 431
HF 434
HF 437

Tank mounted return line filters

HF 502
HF 508
HF 547
HF 554
HF 570
HF 575
HF 578
HF 595

In line filters Spin-On

HF 620
HF 625
HF 650

In line medium and high pressure filters

HF 690
HF 705
HF 710
HF 725
HF 735
HF 745
HF 760
HF 761

Accessories

Filler breathers
Air filters
Level and temperature gauges
Pressure gauges
Pressure/vacuum gauges
Clogging indicators



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