
Castel
Filter shell with replaceable solid cores or filter-block for liquid and suction lines
Media: R22 - R134a R404A - R407C - R507
Type
PS 32 bar (470 PSIG)
TS -40 / + 80 °C
V L
Lot N.
LISTED 81D4
PESSANO - MI MADE IN ITALY
FLOW DIRECTION

Castel

DEHYDRATION OF REFRIGERANTS

Among contaminating agents causing serious damages to refrigerating systems, moisture plays a major role. Its presence, even possible in the refrigerating system, is due to many factors:

- inadequate or insufficiently prolonged vacuum before refrigerant charging;
- oil used for topping up remained exposed to air humidity;
- refrigerant used for subsequent additions contained in non dried vessels;
- sealing defects especially in systems not designed for operation at low temperatures.

High temperatures combined with humidity give rise to complex phenomena enhancing acid formation both in lubricating oil and refrigerant.
Oil organic acids react with metal and favor the formation of sludge, which are viscous clots consisting of insoluble metal salts and large molecules of polymerized oil.
Sludge affects the lubrication of the moving elements of the compressor, can clog valves and filters and cause serious damages.
Acids, especially hydrofluoric acid, produced by the hydrolysis of the fluorinated refrigerant (in compressors iron and aluminum act as catalysts) are particularly corrosive.
Acids etch metal surfaces with the consequent formation of crystal salts, which stick to surfaces and affect the total heat exchange coefficient in the condenser and in the evaporator.
In the sealed and semi-sealed groups, these salts damage the windings of electric motors as in these groups cold gas cools windings through direct contact.
On the other hand, water solubility in refrigerants in a liquid phase, is quite reduced, especially at low temperatures.
As a consequence, when in the system water exceeds the very low limits of solubility admitted at low temperature, excess water turns into ice, and blocks expansion valves and capillaries either partially or totally.
Consequently, refrigerating plants must be equipped with a filter drier on the liquid line.

Castel supplies two types of dehydrators: molecular sieve and solid core dehydrators.
In filter driers (molecular sieves) with a charge constituted by non-agglomerated products, the dehydrating mass is pressed in between two fine steel mesh disks kept in place by a spring. In fact, the granules must neither be stirred by the flowing refrigerant nor be submitted to mutual abrasion (fig. 1).
In case of abrasion, a rather fine powder is produced which filters cannot block. Furthermore, due to its siliceous characteristics, the powder may damage compressor valves, pistons and cylinders.
Filters with this type of charges should never be mounted horizontally as granules tend to accumulate in the lower section, and might leave part of the flow area uncovered with the consequent formation of a sort of refrigerant by-pass.
The refrigerant should flow through the filter drier from top to bottom for two reasons:
The first relates to partially filled filter driers (molecular sieves). These must not become liquid receiver and interfere with the good operation of the system (especially in the case of a reduced refrigerant charge and of a large size filter drier).
The second reason is that dehydrating granules tend to jump and stir if the refrigerant flows from bottom to top.
Even if the charge is kept pressed by means of a spring, the fluid flow should complete the action of the spring and not be in contrast with it.
In solid core dehydrators, dehydrating and deacidifying products with binders constitute the block (fig. 2).
Water adsorption combines with the neutralization of acids that may be present in the refrigerant, and with a strong filtering action. As there is no risk of abrasion, the position of the solid core dehydrator is not a problem.
It is always advisable to install a moisture indicator downstream the filter, which will show the refrigerant moisture and, consequently, the degree of efficiency of the filter.

The dehydrating capacity of Castel drier is relative to the charge of refrigerant and not to the refrigeration potential of the plant. As a matter of fact, for the same refrigerant potential and for the same type of refrigerant fluid, there can be different refrigerant charges according to the type, design and working conditions of the plant as well as to the shutter degree.

The data shown in the following tables are deduced from the test results of the present Castel production.
It is important to note in the case of a high oil level in the circuit (> 5%) the data shown in the tables will be reduced considerably.

MOLECULAR SIEVE FILTER DRIERS - MSD

APPLICATIONS

The filters, shown in this chapter, are classified “Pressure vessels” in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.1 and are subject of Article 3, Section 1.1 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use refrigerant fluids proper to the Group II (as defined in Article 9, Section 2.2 of Directive 97/23/EC and referred to in Directive 67/548/EEC).

CONSTRUCTION

The filter is completely manufactured in steel, either with nickel-plated Flare threaded connections.
The product range also includes types with copper plated solder connections, offering the possibility to solder the copper pipe inside the connections (ODS) or outside the connections, using a copper sleeve (ODM). The filter charge is not replaceable.

EXAMPLE OF SELECTION

System data:
Refrigerant: R22
Condensing temperature: +50°C
Weight of refrigerant: 34 Kg

According to ARI STANDARDS 710:86, the adsorption capacity of the drier is given by:

(1.050 – 60) x 34 / 1.000 = 33,66 g of H_2O

where:

1.050 p.p.m. = moisture in the refrigerant entering the filter according to ARI STANDARD 710:86
60 p.p.m. = moisture in the refrigerant flowing out the filter according to ARI STANDARD 710:86

Comparing the absorption capacity required with the values shown in table 2, drier mod. 4032 should be selected, with a water absorption capacity of 47,1 g at 50 °C.
If the dehydrating capacity of products is expressed in water drops, it must be remembered that:

1 g of H_2O = 20 water drops.

In this case and when a molecular sieve drier is selected, the following result is obtained:
33,66 x 20 = 673 water drops.

If moisture exceeds the values specified in ARI STANDARDS, a drier with a higher adsorption capacity shall be selected.

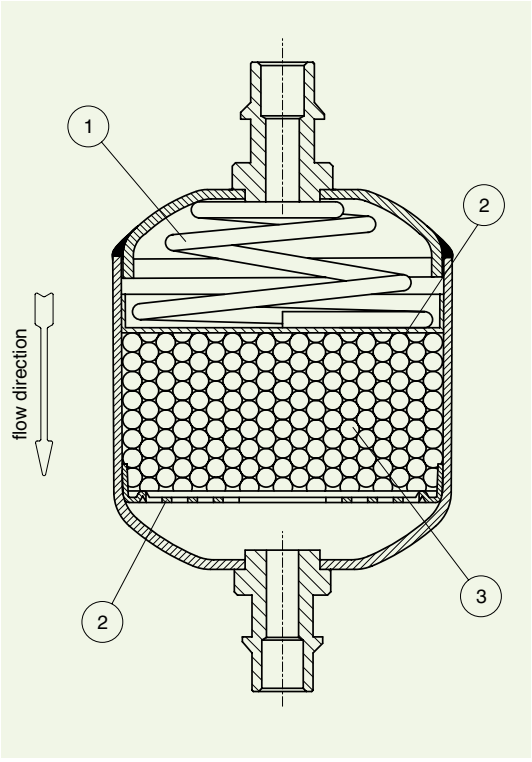


Fig. 1 – Molecular sieve dehydrator (MSD)
1 – Spring
2 – Stainless steel mesh
3 – Dehydrating charge

TABLE 1: General Characteristics

Catalogue Number		International Reference	Nominal Volume [cm³]	Connections					TS [°C]		PS [bar]	Risk Category according to PED
				SAE Flare	ODS		ODM		min.	max.		
Threaded Connections	Solder Connections				Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]				
4003/2	–	032	50	1/4"	–	–	–	–	– 40	+80	42	Art. 3.3
4003/2F (1) R	–	–		1/4"	–	–	–	–				
–	4003/2S R	032S		–	1/4"	–	3/8"	–				
4003/3	–	033		3/8"	–	–	–	–				
–	4003/3S R	033S		–	3/8"	–	1/2"	–				
4005/2	–	052	80	1/4"	–	–	–	–				
4005/2F (1) R	–	–		1/4"	–	–	–	–				
–	4005/2S R	052S		–	1/4"	–	3/8"	–				
4005/3	–	053		3/8"	–	–	–	–				
–	4005/3S R	053S		–	3/8"	–	1/2"	–				
4008/2	–	082	130	1/4"	–	–	–	–				
4008/2F (1) R	–	–		1/4"	–	–	–	–				
–	4008/2S R	082S		–	1/4"	–	3/8"	–				
4008/3	–	083		3/8"	–	–	–	–				
4008/3F (1) R	–	–		3/8"	–	–	–	–				
–	4008/3S R	083S		–	3/8"	–	1/2"	–				
–	4008/M10S R	–		–	–	10	–	12				
4008/4	–	084		1/2"	–	–	–	–				
–	4008/4S R	084S		–	1/2"	–	5/8"	16				
4016/2	–	162	250	1/4"	–	–	–	–				
4016/3	–	163		3/8"	–	–	–	–				
4016/3F (1) R	–	–		3/8"	–	–	–	–				
–	4016/3S R	163S		–	3/8"	–	1/2"	–				
–	4016/M10S R	–		–	–	10	–	12				
4016/4	–	164		1/2"	–	–	–	–				
–	4016/4S R	164S		–	1/2"	–	5/8"	16				
4016/5	–	165		5/8"	–	–	–	–				
4032/4	–	304	500	1/2"	–	–	–	–				
–	4032/4S R	304S		–	1/2"	–	5/8"	16				
4032/5	–	305		5/8"	–	–	–	–				
–	4032/5S R	305S		–	5/8"	16	3/4"	–				
4041/4	–	414	670	1/2"	–	–	–	–				
4041/5	–	415		5/8"	–	–	–	–				
–	4041/5S R	415S		–	5/8"	16	3/4"	–				
4041/6	–	416		3/4"	–	–	–	–				

(1) Male-female connections (Inlet female)

R *Available on request*

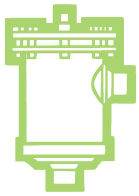
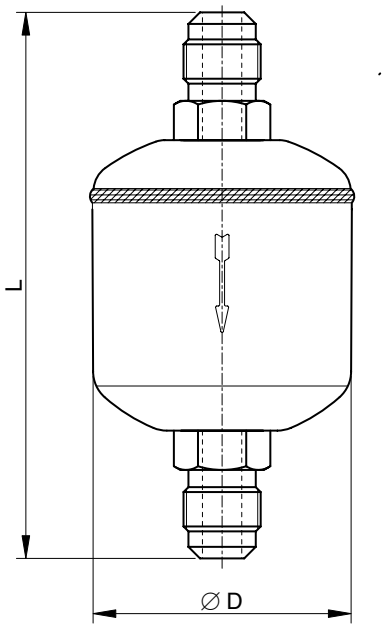


TABLE 2: Refrigerant Flow Capacity and Water Capacity

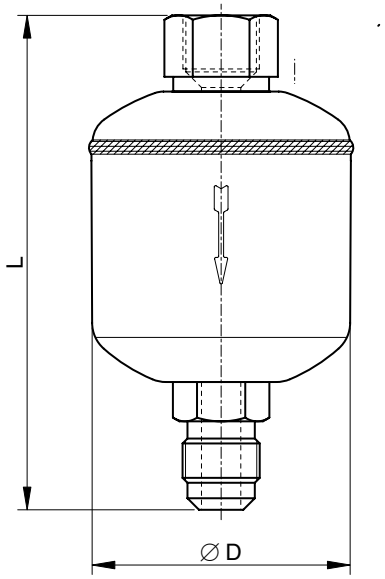
Catalogue Number	Refrigerant Flow Capacity, pressure drop 0,07 bar (1) [kW]					Water Capacity at + 25 °C [g H_2O]					Dehydratable Charge at + 25 °C [kg refrigerant]					Water Capacity at + 50 °C [g H_2O]					Dehydratable Charge at + 50 °C [kg refrigerant]				
	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	R410A
4003/2	5,8	6,3	4,1	6,2	6,3	5,2	4,6	5,3	4,3	4,7	5,6	4,9	5,7	4,6	5,0	4,7	4,0	5,2	3,6	3,9	5,1	4,3	5,6	3,8	4,2
4003/2F																									
4003/2S	7,1	7,7	5,4	7,6	7,7																				
4003/3	17,1	18,5	12,0	18,4	18,6																				
4003/3S	21,0	22,7	14,7	22,6	22,8																				
4005/2	6,4	6,9	4,5	6,8	6,9	10,1	8,9	10,3	8,3	9,0	11,0	9,5	11,1	8,9	9,7	9,1	7,7	10,0	6,9	7,6	9,8	8,3	10,8	7,4	8,2
4005/2F																									
4005/2S	7,9	8,5	5,5	8,3	8,5																				
4005/3	18,1	19,6	12,8	19,5	19,7																				
4005/3S	22,6	24,5	16,0	24,4	24,6																				
4008/2	6,7	7,2	4,7	7,1	7,2	17,8	15,6	18,2	14,5	15,8	19,2	16,8	19,5	15,6	17,0	16,1	13,6	17,6	12,2	13,4	17,3	14,6	18,9	13,1	14,4
4008/2F																									
4008/2S	8,2	8,8	5,8	8,7	8,8																				
4008/3	18,6	20,1	13,1	19,9	20,2																				
4008/3F																									
4008/3S	23,4	25,3	16,5	25,1	25,4																				
4008/M10S																									
4008/4	24,5	26,5	17,3	26,3	26,6																				
4008/4S	29,4	31,8	20,7	31,5	31,9																				
4016/2	6,7	7,2	4,7	7,1	7,2	34,1	29,8	34,8	27,8	30,3	36,7	32,1	37,4	29,9	32,5	30,7	26,0	33,6	23,3	25,6	33,0	28,0	36,2	25,1	27,5
4016/3	19,4	21,0	13,7	20,8	21,1																				
4016/3F																									
4016/3S	24,2	26,2	17,1	26,0	26,3																				
4016/M10S																									
4016/4	33,7	36,4	23,7	36,1	36,5																				
4016/4S	40,4	43,7	28,4	43,3	43,9																				
4016/5	39,3	42,5	27,7	42,2	42,7																				
4032/4	36,4	39,4	25,6	39,1	39,6	61,7	54,0	62,9	50,3	54,8	66,3	58,1	67,6	54,1	58,9	55,6	47,1	60,9	42,2	46,3	59,8	50,6	65,5	45,4	49,8
4032/4S	43,7	47,3	30,7	46,9	47,5																				
4032/5	42,6	46,0	29,9	45,6	46,2																				
4032/5S	51,1	55,2	35,9	54,7	55,4																				
4041/4	39,3	42,5	27,7	42,2	42,7	95,1	83,2	97,0	77,6	84,5	102	89,5	104	83,4	90,9	85,7	72,6	93,8	65,1	71,3	92,2	78,1	100	70,0	76,7
4041/5	46,0	49,7	32,4	49,3	49,9																				
4041/5S	55,2	59,6	38,9	59,1	59,8																				
4041/6	58,8	63,6	41,4	63,1	63,9																				

(1) Maximum values of the refrigerant flow capacity at which the drier can be used when fluid dehydration is not the a major problem, provided that the original moisture is limited before the installation of the drier. The maximum refrigerant flow capacities are referred to a total pressure drop of 0,07 bar, inlet and outlet connections included, (according to ARI STANDARD 710:86 – with condensing temperature at + 30 °C and evaporating temperature at -15 °C).

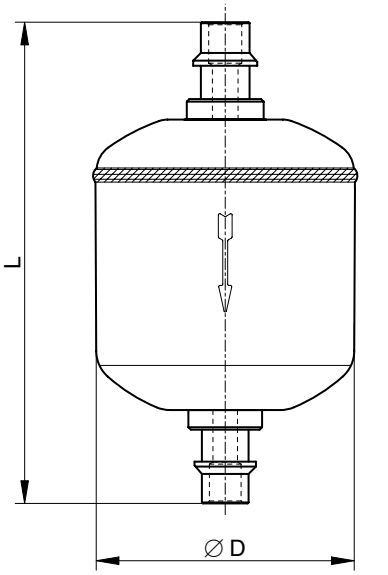
(2) : Water capacity values with R22 are referred to the following conditions, fixed in ARI STANDARD 710:86:
- Liquid temperatures: 25 °C and 50 °C
- Equilibrium point dryness, EPD: 60 ppm
Water capacity values with the other refrigerant fluids are referred to the following conditions, fixed in DIN 8949:2000 Standard:
- Liquid temperatures: 25 °C and 50 °C
- Equilibrium point dryness, EPD: 50 ppm



male connections



male - female connections (female - in)



solder connections

TABLE 3: Dimensions and Weights

Catalogue Number	Connections			Dimensions [mm]		Weight [g]
	SAE Flare	ODS				
		Ø [in.]	Ø [mm]	Ø D	L	
4003/2	1/4"	–	–	52	103	260
4003/2F	1/4"	–	–		92	250
4003/2S	–	1/4"	–		94	235
4003/3	3/8"	–	–		111	275
4003/3S	–	3/8"	–		96	235
4005/2	1/4"	–	–		119	300
4005/2F	1/4"	–	–		108	300
4005/2S	–	1/4"	–		110	285
4005/3	3/8"	–	–		127	320
4005/3S	–	3/8"	–		112	275
4008/2	1/4"	–	–		146	400
4008/2F	1/4"	–	–		135	390
4008/2S	–	1/4"	–		137	375
4008/3	3/8"	–	–		154	415
4008/3F	3/8"	–	–		142	395
4008/3S	–	3/8"	–		139	375
4008/M10S	–	–	10			375
4008/4	1/2"	–	–		162	450
4008/4S	–	1/2"	–		146	390
4016/2	1/4"	–	–	73	158	720
4016/3	3/8"	–	–		166	735
4016/3F	3/8"	–	–		154	720
4016/3S	–	3/8"	–		151	745
4016/M10S	–	–	10			695
4016/4	1/2"	–	–		174	780
4016/4S	–	1/2"	–		158	695
4016/5	5/8"	–	–		183	820
4032/4	1/2"	–	–	91	187	1415
4032/4S	–	1/2"	–		173	1355
4032/5	5/8"	–	–		196	1460
4032/5S	–	5/8"	16		179	1400
4041/4	1/2"	–	–		222	1715
4041/5	5/8"	–	–		231	1810
4041/5S	–	5/8"	16		214	1620
4041/6	3/4"	–	–		232	1920

ANTI-ACID SOLID CORE FILTER DRIERS

Approved by Underwriters Laboratories Inc. (UL)

APPLICATIONS

The filters, shown in this chapter, are classified “Pressure vessels” in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.1 and are subject of Article 3, Section 1.1 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use refrigerant fluids proper to the Group II (as defined in Article 9, Section 2.2 of Directive 97/23/EC and referred to in Directive 67/548/EEC).
New filters series 4303, 4305 and 4308 have been developed for specific installations on refrigerating systems using HFC refrigerant fluids, particularly R134a, R404A, R407C, R410A and R507 mixed with polyolester lubricants. In spite of this, the new block may be successfully used also in refrigerating systems using the old CFC, or HCFC refrigerant fluids, mixed with mineral lubricants.

CONSTRUCTION

The filter is completely manufactured in steel, either with nickel-plated Flare threaded connections.

The product range also includes types with copper plated solder connections, offering the possibility to solder the copper pipe inside the connections (ODS) or outside the connections, using a copper sleeve (ODM).
On specific customers’ request, Castel is also able the supply them filters series 4303, 4305, 4308, 4316, 4332 and 4341 with solder connections made of copper tube EN 12735-1 – Cu-DHP.
The blocks in the filters series 4303, 4305 and 4308 are molded from a blend of dehydrating charge, totally made of 3 Å molecular sieves, and a special binding agent in appropriate proportions. The choice of the 3 Å molecular sieves, as sole dehydrating material, gives to the block a very high capacity of water adsorption also maintaining good deacidifying characteristics; this choice also keep unchanged the original concentration of additives in the polyolester lubricant.
Whereas the blocks in the filters series 4316, 4332 and 4341 are moulded from adequately proportioned granules of different dehydrating materials and special binders. The manufacturing process gives a considerable compacted ness and stoutness to both the products so that they are resistant to shocks and abrasions.

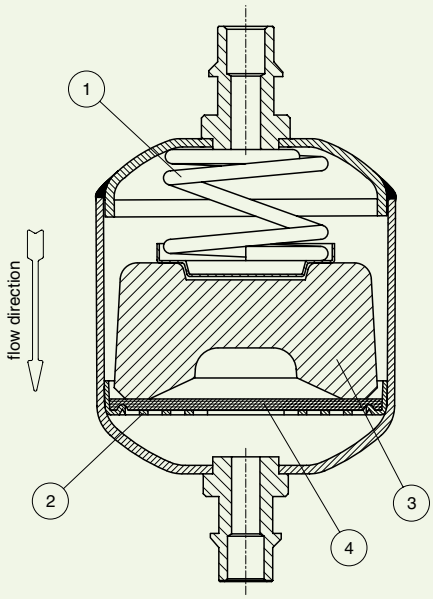


Fig. 2 – Solid core dehydrator
1 – Spring
2 – Stainless steel mesh
3 – Block
4 – Felt

The shape of the block is designed in order to offer the maximum possible surface area to the incoming fluid. The internal cavity is also positioned in such a way as to have a uniform wall thickness. As a result, the fluid encounters a constant strength at all points, flows linearly through the block, and ensures efficient dehydration and minimum charge loss. The block is chemically inert, not deliquescent, does not react with refrigerating fluids, and is capable of blocking oil by-products dragged into the circuit. Impurities accumulate in the ring between the metal shell and the block; this prevents filter clogging.

TABLE 1: General Characteristics

Catalogue Number		International Reference	Block Filtering Surface [cm²]	Nominal Volume [cm³]	Attacchi					TS [°C]		PS [bar]	Risk Category according to PED
Threaded Connections	Solder Connections				SAE Flare	ODS		ODM		min.	max.		
						Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]				
4303/2	–	032	47	50	1/4"	–	–	–	–	– 40	+80	42 (2)	Art. 3.3
4303/2F (1)	–	–			1/4"	–	–	–	–				
–	4303/2S	032S			–	1/4"	–	3/8"	–				
4303/3	–	033			3/8"	–	–	–	–				
4305/2	–	052	70	80	1/4"	–	–	–	–				
4305/2F (1)	–	–			1/4"	–	–	–	–				
–	4305/2S	052S			–	1/4"	–	3/8"	–				
4305/3	–	053			3/8"	–	–	–	–				
–	4305/3S	053S			–	3/8"	–	1/2"	–				
–	4305/M10S	–			–	–	10	–	12				
4308/2	–	082	103	130	1/4"	–	–	–	–				
4308/2F (1)	–	–			1/4"	–	–	–	–				
–	4308/2S	082S			–	1/4"	–	3/8"	–				
4308/3	–	083			3/8"	–	–	–	–				
4308/3F (1)	–	–			3/8"	–	–	–	–				
–	4308/3S	083S			–	3/8"	–	1/2"	–				
–	4308/M10S	–			–	–	10	–	12				
–	4308/M12S	–			–	–	12	–	14				
4308/4	–	084			1/2"	–	–	–	–				
–	4308/4S	084S			–	1/2"	–	5/8"	16				
4316/2	–	162	155	250	1/4"	–	–	–	–				
4316/3	–	163			3/8"	–	–	–	–				
4316/3F (1)	–	–			3/8"	–	–	–	–				
–	4316/3S	163S			–	3/8"	–	1/2"	–				
–	4316/M10S	–			–	–	10	–	12				
–	4316/M12S	–			–	–	12	–	14				
4316/4	–	164			1/2"	–	–	–	–				
–	4316/4S	164S			–	1/2"	–	5/8"	16				
4316/5	–	165			5/8"	–	–	–	–				
–	4316/5S	165S			–	5/8"	16	3/4"	–				
4332/4	–	304	255	500	1/2"	–	–	–	–				
–	4332/4S	304S			–	1/2"	–	5/8"	16				
4332/5	–	305			5/8"	–	–	–	–				
–	4332/5S	305S			–	5/8"	16	3/4"	–				
4341/5	–	415	330	670	5/8"	–	–	–	–				
–	4341/5S	415S			–	5/8"	16	3/4"	–				
4341/6	–	416			3/4"	–	–	–	–				
–	4341/6S	416S			–	3/4"	–	7/8"	–				
–	4341/7S	417S			–	7/8"	–	1.1/8"	–				

(1) Male-female connections (Inlet female)

(2) PS = 400 psig in compliance with the UL approval

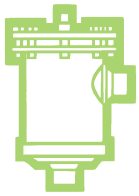
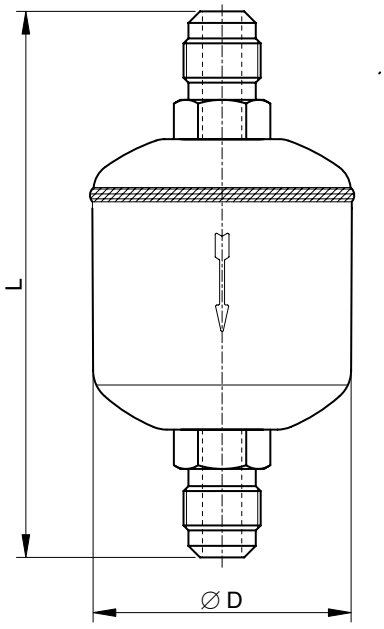


TABLE 2: Refrigerant Flow Capacity and Water Capacity

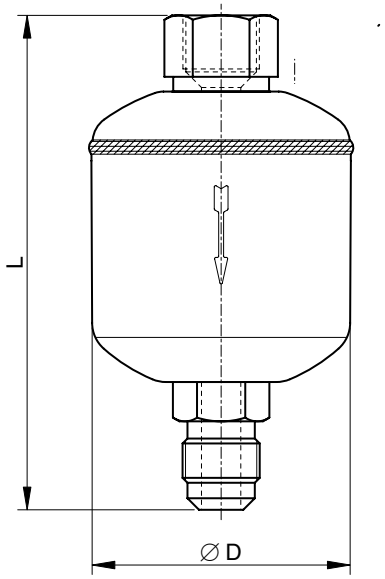
Catalogue Number	Refrigerant Flow Capacity, pressure drop 0,07 bar (1) [kW]					Water Capacity at + 25 °C [g H_2O]					Dehydratable Charge at + 25 °C [kg refrigerant]					Water Capacity at + 50 °C [g H_2O]					Dehydratable Charge at + 50 °C [kg refrigerant]				
	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	R410A	R134a	R22	R404A R507	R407C	
4303/2	6,5	7,0	4,6	6,9	7,0	4,1	3,8	4,2	3,4	3,7	4,4	4,0	4,5	3,6	3,9	3,5	3,0	3,9	2,7	2,9	3,8	3,2	4,2	2,9	3,2
4303/2F																									
4303/2S	8,0	8,6	5,6	8,5	8,6																				
4303/3	14,9	16,1	10,5	16,0	16,2																				
4305/2	6,7	7,2	4,7	7,1	7,2	7,3	6,7	7,4	6,0	6,5	7,8	7,2	8,0	6,4	7,0	6,3	5,3	6,9	4,8	5,2	6,8	5,7	7,4	5,2	5,6
4305/2F																									
4305/2S	8,2	8,9	5,8	8,8	9,0																				
4305/3	15,4	16,6	10,8	16,5	16,7																				
4305/3S	19,4	21,0	13,7	20,8	21,2																				
4305/M10S																									
4308/2	6,9	7,5	4,9	7,4	7,5	12,7	11,6	13,0	10,4	11,3	13,7	12,5	13,9	11,2	12,2	10,9	9,3	12,0	8,4	9,1	11,8	10,0	13,0	9,0	9,8
4308/2F																									
4308/2S	8,5	9,2	6,0	9,1	9,3																				
4308/3	18,0	19,5	12,7	19,3	19,6																				
4308/3F																									
4308/3S	22,8	24,7	16,1	24,5	24,8																				
4308/M10S																									
4308/M12S	29,0	31,3	20,4	31,0	31,4																				
4308/4	24,0	25,9	16,9	25,7	26,0																				
4308/4S	29,0	31,3	20,4	31,0	31,4																				
4316/2	6,9	7,5	4,9	7,4	7,5	8,5	8,5	8,1	7,7	8,3	9,1	9,1	8,7	8,2	8,9	7,0	7,0	6,7	6,3	6,8	7,5	7,5	7,2	6,8	7,3
4316/3	19,7	21,3	13,9	21,1	21,4																				
4316/3F																									
4316/3S	24,6	26,6	17,3	26,4	26,7																				
4316/M10S	34,1	36,9	24,0	36,6	37,0																				
4316/M12S	28,2	30,5	19,9	30,3	30,6																				
4316/4	34,1	36,9	24,0	36,6	37,0																				
4316/4S	37,6	40,6	26,4	40,3	40,8																				
4316/5	45,0	48,7	31,7	48,3	48,9																				
4316/5S	33,6	36,3	23,6	36,0	36,4																				
4332/4	40,5	43,8	28,5	43,4	44,0	15,9	15,9	15,3	14,4	15,6	17,1	17,1	16,5	15,5	16,8	13,2	13,2	12,6	12,0	12,9	14,2	14,2	13,5	12,9	13,9
4332/4S	39,9	43,1	28,1	42,8	43,0																				
4332/5	48,2	52,1	33,9	51,7	52,3																				
4332/5S	40,9	44,2	28,8	43,8	44,4																				
4341/5	49,5	53,5	34,8	53,1	53,7	20,7	20,7	20,0	18,7	20,3	22,3	22,3	21,5	20,1	21,8	17,1	17,1	16,3	15,5	16,7	18,4	18,4	17,5	16,7	18,0
4341/5S	67,2	72,6	47,3	72,0	73,0																				
4341/6																									
4341/6S	74,2	80,2	52,2	79,6	80,5																				
4341/7S																									

(1) Maximum values of the refrigerant flow capacity at which the drier can be used when fluid dehydration is not the a major problem, provided that the original moisture is limited before the installation of the drier. The maximum refrigerant flow capacities are referred to a total pressure drop of 0,07 bar, inlet and outlet connections included, (according to ARI STANDARD 710:86 - with condensing temperature at +30 °C and evaporating temperature at -15 °C)

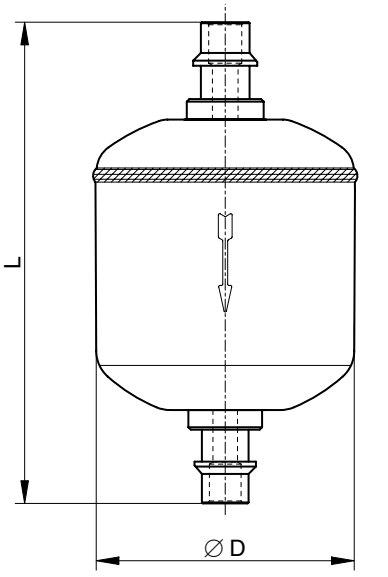
(2) Water capacity values with R22 are referred to the following conditions, fixed in ARI STANDARD 710:86:
- Liquid temperatures: 25 °C and 50 °C
- Equilibrium point dryness, EPD: 60 ppm
Water capacity values with the other refrigerant fluids are referred to the following conditions, fixed in DIN 8949:2000 Standard:
- Liquid temperatures: 25 °C and 50 °C
- Equilibrium point dryness, EPD: 50 ppm



male connections



male - female connections (female - in)



solder connections

TABLE 3: Dimensions and Weights

Catalogue Number	Connections			Dimensions [mm]		Weight [g]
	SAE Flare	ODS				
		Ø [in.]	Ø [mm]	Ø D	L	
4303/2	1/4"	–	–	52	103	240
4303/2F	1/4"	–	–		92	230
4303/2S	–	1/4"	–		94	220
4303/3	3/8"	–	–		111	235
4305/2	1/4"	–	–		119	275
4305/2F	1/4"	–	–		109	
4305/2S	–	1/4"	–		110	260
4305/3	3/8"	–	–		127	295
4305/3S	–	3/8"	–		112	260
4305/M10S	–	–	10			
4308/2	1/4"	–	–		146	380
4308/2F	1/4"	–	–		135	
4308/2S	–	1/4"	–		137	345
4308/3	3/8"	–	–		154	395
4308/3F	3/8"	–	–		142	380
4308/3S	–	3/8"	–		139	345
4308/M10S	–	–	10			
4308/M12S	–	–	12		146	380
4308/4	1/2"	–	–		162	430
4308/4S	–	1/2"	–		146	380
4316/2	1/4"	–	–	73	158	635
4316/3	3/8"	–	–		166	690
4316/3F	3/8"	–	–		154	680
4316/3S	–	3/8"	–		151	620
4316/M10S	–	–	10			630
4316/M12S	–	–	12		158	640
4316/4	1/2"	–	–		174	680
4316/4S	–	1/2"	–		158	640
4316/5	5/8"	–	–		183	740
4316/5S	–	5/8"	16		166	640
4332/4	1/2"	–	–	91	187	1300
4332/4S	–	1/2"	–		173	1200
4332/5	5/8"	–	–		196	1320
4332/5S	–	5/8"	16		179	1250
4341/5	5/8"	–	–		231	1580
4341/5S	–	5/8"	16		214	1470
4341/6	3/4"	–	–		232	1640
4341/6S	–	3/4"	–		219	1560
4341/7S	–	7/8"	–			1600

FILTER DRIERS WITH REPLACEABLE ANTI-ACID SOLID CORE

Approved by Underwriters Laboratories Inc. (UL)
Except filters 4423/17A, /21A, /25A and 4424/25A, /33A

APPLICATIONS

The filters, shown in this chapter, are classified “Pressure vessels” in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.1 and are subject of Article 3, Section 1.1 of the same Directive. They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use refrigerant fluids proper to the Group II (as defined in Article 9, Section 2.2 of Directive 97/23/EC and referred to in Directive 67/548/EEC).

OPERATION

In the case of filters with more than one block, the passage of the fluid takes place in parallel; as a result, the pressure drop does not increase proportionately to the number of blocks. A large ring between the block and the inner surface of the filter permits the accumulation of solid particles, and prevents clogging. Before leaving the filter, the refrigerant fluid must pass through the mesh sieve on which blocks are mounted. The danger that small particles of dehydrating material being introduced into the system is thus avoided. Furthermore, at filter outlet, a plastic cup, the edge of which closely adheres to the inner surface of the filter, prevents dirt from reaching the outlet connection during normal operation and block change.

CONSTRUCTION

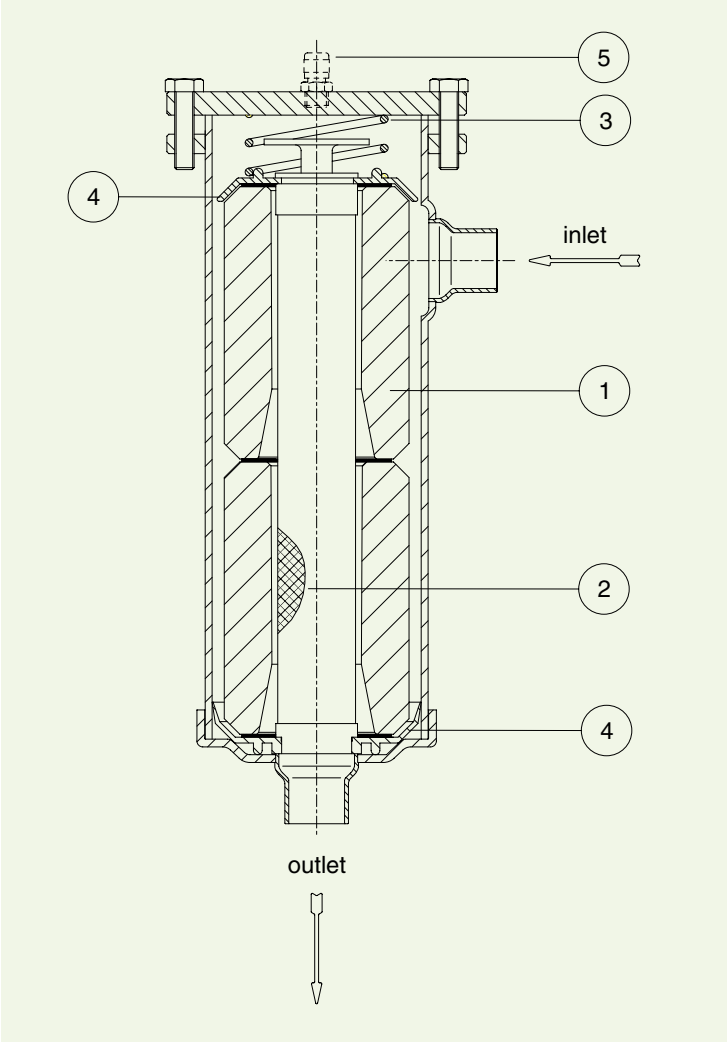
The filters type 4410 are manufactured in steel, with the exception of the connections which are made of EN 12735-1-Cu-DHP copper tube.
The filters type 4420 are completely manufactured in steel and solder connection, are machined with a steel bar EN 10277-3 11S Mn Pb 37 + C.
Blocks type 4490/A – 4490/B – 4491/A are chemically inert, are not deliquescent and are capable of blocking products resulting

TABLE 1: General Characteristics

Catalogue Number	Core Cat. Number	Number of Cores	Core Filtering Surface [cm²]	Nominal Volume		Connections			TS [°C]		PS [bar]	Risk Category according to PED
						ODS		ODM				
				[cu.in]	[cm³]	Ø [in.]	Ø [mm]	Ø [mm]	min.	max.		
4411/5A	4490/A - 4490/B - 4490/HA	1	420	48	800	5/8"	16	–	– 40	+80	32	I
4411/7A						7/8"	22					
4411/9A						1.1/8"	–					
4411/11A						1.3/8"	35					
4411/13A						1.5/8"	–					
4411/M42A						–	42					
4411/17A						2.1/8"	54					
4412/7A		2	840	96	1600	7/8"	22					
4412/9A						1.1/8"	–					
4412/11A						1.3/8"	35					
4412/M42A						–	42					
4412/17A						2.1/8"	54					
4413/11A		3	1260	144	2400	1.3/8"	–					
4413/13A						1.5/8"	42					
4413/M42A						–	–					
4414/13A		4	1680	192	3200	1.5/8"	42					
4414/M42A						–	54					
4414/17A						2.1/8"	54					
4423/17A	4491/A	3	1890	300	4800	2.1/8"	–	60,3				II
4423/21A						2.5/8"	–	76,1				
4423/25A						3.1/8"	–	88,9				
4424/25A		4	2520	400	6400	3.1/8"	–	88,9				
4424/33A						4.1/8"		114,3				

from an alteration process of lubrication oil. These blocks are moulded from a blend of granules of dehydrating materials and a special binding agent in appropriate proportions.
The new blocks type 4490/HA has been developed for specific installations on refrigerating systems using HFC refrigerant fluids, particularly R134a, R404A, R407C, R410A ed R507 mixed with polyolester lubricants. In spite of this, the new block may be successfully used also in refrigerating systems using the old CFC or HCFC refrigerant fluids, mixed with mineral lubricants.
These new blocks are molded from a blend of dehydrating charge, totally made of 3 Å molecular sieves, and a special binding agent in appropriate proportions. The choice of the 3 Å molecular sieves, as sole dehydrating material, gives to the block a very high capacity of water adsorption also maintaining good deacidifying characteristics; this choice also keeps unchanged the original concentration of additives in the polyolester lubricant.
Either the manufacturing process of blocks 4490/A - /B, 4491/A or the one of new blocks 4490/HA give a considerable compacted ness and stoutness to the product so that it is resistant to shocks and abrasions.
The blocks 4490/A; /B; /HA have a volume of 48 cu.in., equivalent to approx. 800 cm^3, and it is used with type 4411, 4412, 4413 and 4414 filters.

The block 4491 has a volume of 96 cu.in., equivalent to approx. 1600 cm^3, and it is used with type 4421, 4423 and 4424 filters.
The two blocks are shaped as a hollow cylinder and their overall dimensions correspond to those of other international brands.
Consequently they are interchangeable. The hollow cylinder shape offers a large surface area to the inflowing fluid, which crosses the block in radial sense. As a result, dehydration is highly efficient with a minimum loss of charge.
Filters may be supplied also with an access fitting kit G9150/R05, to be ordered separately.



Sketch of filter with 2 blocks
1 – Block
2 – Mesh sieve serving as block support
3 – Spring
4 – Retainer cup
5 – Access fitting 1/4" SAE flare (to order separately)

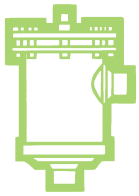


TABLE 2A: Refrigerant Flow Capacity and Water Capacity (standard blocks)

Catalogue Number	Refrigerant Flow Capacity, pressure drop 0,07 bar (1) [kW]				Water Capacity at + 25 °C [g H_2O]				Dehydratable Charge at + 25 °C [kg refrigerant]				Water Capacity at + 50 °C [g H_2O]				Dehydratable Charge at + 50 °C [kg refrigerant]			
	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C
4411/5A	83	90	59	89																
4411/7A	146	158	103	156																
4411/9A	200	216	141	214																
4411/11A	233	252	164	250	31	31	30	28	34	34	32	30	26	26	25	24	28	28	27	26
4411/13A																				
4411/M42A	250	270	176	268																
4411/17A																				
4412/7A	146	158	103	156																
4412/9A	226	244	159	242																
4412/11A	306	331	215	328	62	62	60	56	67	67	65	60	52	52	50	48	56	56	54	52
4412/M42A	333	361	234	357																
4412/17A																				
4413/11A	327	354	230	351																
4413/13A	361	391	254	387	94	94	91	84	101	101	97	90	78	78	76	72	84	84	81	77
4413/M42A																				
4414/13A																				
4414/M42A	426	460	300	456	125	125	121	112	134	134	130	120	104	104	101	96	112	112	108	103
4414/17A																				
4423/17A	447	483	315	479																
4423/21A	492	532	346	527	187	187	180	169	201	201	194	182	155	155	151	147	167	167	162	158
4423/25A	670	725	472	719																
4424/25A	737	797	519	791	249	249	240	225	268	268	258	242	207	207	201	196	222	222	216	211
4424/33A	1180	1276	830	1265																

TABLE 2B: Refrigerant Flow Capacity and Water Capacity

Nr. Catalogo	Refrigerant Flow Capacity, pressure drop 0,07 bar (1) [kW]				Water Capacity at + 25 °C [g H_2O]				Dehydratable Charge at + 25 °C [kg refrigerant]				Water Capacity at + 50 °C [g H_2O]				Dehydratable Charge at + 50 °C [kg refrigerant]			
	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C	R134a	R22	R404A	R407C
4490/HA	(3)				84	77	86	69	90	83	92	74	72	61	80	56	77	66	86	60

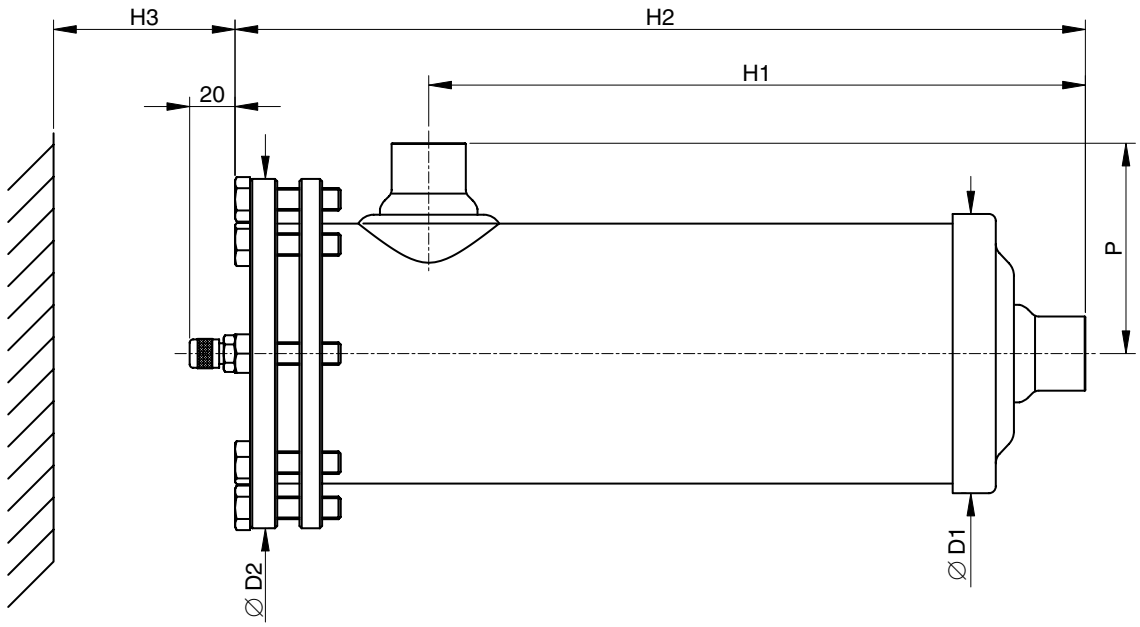
(1) Maximum values of the refrigerant flow capacity at which the drier can be used when fluid dehydration is not the a major problem, provided that the original moisture is limited before the installation of the drier. The maximum refrigerant flow capacities are referred to a total pressure drop of 0,07 bar, inlet and outlet connections included, (according to ARI STANDARD 710:86 - with condensing temperature at + 30 °C and evaporating temperature at -15 °C)

(2) Water capacity values with R22 are referred to the following conditions, fixed in ARI STANDARD 710:86:
- Liquid temperatures: 25 °C and 50 °C
- Equilibrium point dryness, EPD: 60 ppm
Water capacity values with the other refrigerant fluids are referred to the following conditions, fixed in DIN 8949:2000 Standard:
- Liquid temperatures: 25 °C and 50 °C
- Equilibrium point dryness, EPD: 50 ppm

(3) Maximum values of the refrigerant flow capacity (according to ARI STANDARD 710:86) at which filter driers series 4411, 4412, 4413 and 4414 can be used with 4490/HA blocks, when fluid dehydration is not the a major problem, are the same achieved with 4490/A and 4490/B blocks.

TABLE 3: Dimensions and Weights

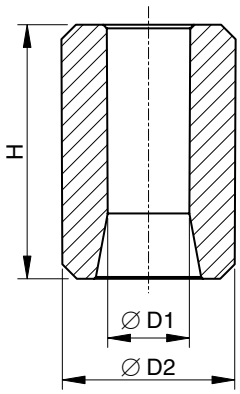
Catalogue Number	Connections			Dimensions [mm]						Weight [g]
	ODS		W							
	Ø [in.]	Ø [mm]	Ø [mm]	Ø D_1	Ø D_2	H_1	H_2	H_3	P	
4411/5A	5/8"	16	–	123	154	144	231	185	88	5360
4411/7A	7/8"	22				149	236		93	5405
4411/9A	1.1/8"	–								5395
4411/11A	1.3/8"	35				154	241		98	5464
4411/13A	1.5/8"	–				159	246		103	5435
4411/M42A	–	42								5410
4411/17A	2.1/8"	54				169	256		113	5585
4412/7A	7/8"	22				290	377	324	93	6880
4412/9A	1.1/8"	–								
4412/11A	1.3/8"	35				295	382		98	7015
4412/M42A	–	42				299	385		103	6985
4412/17A	2.1/8"	54				309	395		113	7136
4413/11A	1.3/8"	35				435	524		98	8510
4413/13A	1.5/8"	–				440	529		103	8470
4413/M42A	–	42								8445
4414/13A	1.5/8"	–				582	670			9940
4414/M42A	–	42								10010
4414/17A	2.1/8"	54				592	680		113	
4423/17A	2.1/8"	54	60,3	163	200	520	641	600	143	18000
4423/21A	2.5/8"	–	76,1							18200
4423/25A	3.1/8"	–	88,9			525	646		148	18400
4424/25A	3.1/8"	–	88,9			693	814	760		21600
4424/33A	4.1/8"	–	114,3							22000



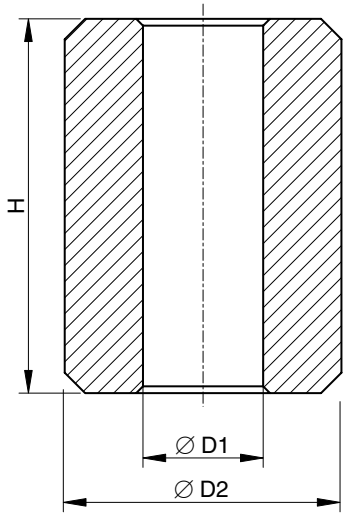
BLOCKS REPLACEMENT

Blocks must be ordered separately from the filter. They are supplied in individual packages, which are hermetically sealed in suitable wrappings (type 4490), and in special bags (type 4491) for safe storage over long periods of time.
Every cartridge is equipped of two seals in synthetic material to use like seal between the two cartridges and between the cartridge and its covers.
If the filter is installed in a system without any by-pass, the block replacement has to be done following these instructions:

1 Close the valve on the departing line.
2 Start the compressor and its auxiliaries in order to transfer the refrigerant charge into the high pressure side of the plant (liquid receiver).
3 Stop the compressor at a suction pressure sufficiently higher than the atmospheric pressure.
4 Shutt off the service valve at the suction side of the compressor.
NOTE: if during the transfer of the refrigerant to the high-pressure side of the plant, the discharge pressures reach too high values (the condenser is flooded due to insufficient capacity of the liquid receiver), shut off the valve on the compressor suction side and stop immediately the compressor.
5 Replace quickly the filter block. During the preparation of the new block, close the filter with a clean cloth. The slight over-pressure inside the filter and the ability of the technician will prevent air from getting into the plant.
6 The internal cleanliness of the body is guaranteed by the cleaning effect of the cup which is characteristic of Castel filters.
if air is supposed to have entered the plant during filter block replacement, produce a vacuum in the low-pressure side of the plant, and always in the sector of the circuit involved.
7 Open the valve on the departure of liquid line
8 Slowly open the suction valve of the compressor and start the compressor and its auxiliaries.
9 Top the charge up, if necessary.



4490



4491

TABLE 4: General Characteristics, Dimensions and Weights

Catalogue Number	Catalogue Number	Nominal Volume		Dimensions [mm]			Weight [g]
		[cu.in]	[cm³]	Ø D_1	Ø D_2	H	
4490/A	420	48	800	47	96	140	600
4490/B (1)							
4490/HA							530
4491/A	630	96	1600	53	122	165	1250

(1) Supplied without cover gasket as spare part

MECHANICAL FILTERS WITH REPLACEABLE FILTERING BLOCK

Approved by Underwriters Laboratories Inc. (UL)
Except filters 4421/21C, /25C, /M80C, /33C

APPLICATIONS

The filters, shown in this chapter, are classified “Pressure vessels” in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.1 and are subject of Article 3, Section 1.1 of the same Directive. They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use refrigerant fluids proper to the Group II (as defined in Article 9, Section 2.2 of Directive 97/23/EC and referred to in Directive 67/548/EEC).

OPERATION

Good filtering of the refrigerant on the low-pressure side of the system is a guarantee of protection for the compressor. System cleanliness is ensured by micro filtering cores, which filter out impurities derived from manufacture and assembly of the refrigerating system.

CONSTRUCTION

The filters type 4410 are manufactured in steel, with the exception of the connections which are made of EN 12735-1 – Cu-DHP copper tube.
The filters type 4420 are completely manufactured in steel and solder connection, are machined with a steel bar EN 10277-3 11S Mn Pb 37 +C.
Zinc plated wire cloths and a filtering baffle form the block, which features a large surface, with controlled porosity.
The block can stop solid particles up to 20 micron. At the two ends, soft felt gaskets ensure perfect sealing with the plastic cups.
Filters are supplied with an access fitting kit G9150/R05.

SUCTION LINE

SELECTION CRITERION

With clean systems, refrigerant flow capacity and pressure drops of table 2 are reported to a gas speed of 20 m/s for pipes adequate to the filter connections.

For refrigerant flow capacities different from the table values, under the other same conditions, gas speeds and relative pressure drops through the filter can be gained for simple proportionality.

EXAMPLE

System data:
Refrigerant: R22
Refrigerant flow capacity: 130 [kW]
Evaporating temperature: + 5 [°C]
Suction pipe: Ø 2.1/8”
Filter: 4411/17C

In table 2, corresponding to filter type 4411/17C refrigerant and evaporating temperature, the following data is given:

– refrigerant flow capacity = 162 [kW];
– pressure drop = 0,23 [bar].

The gas speed in the suction line will be:

$$20 \times \frac{130^2}{162^2} = 16 \quad [m/s]$$

Pressure drop through the filter:

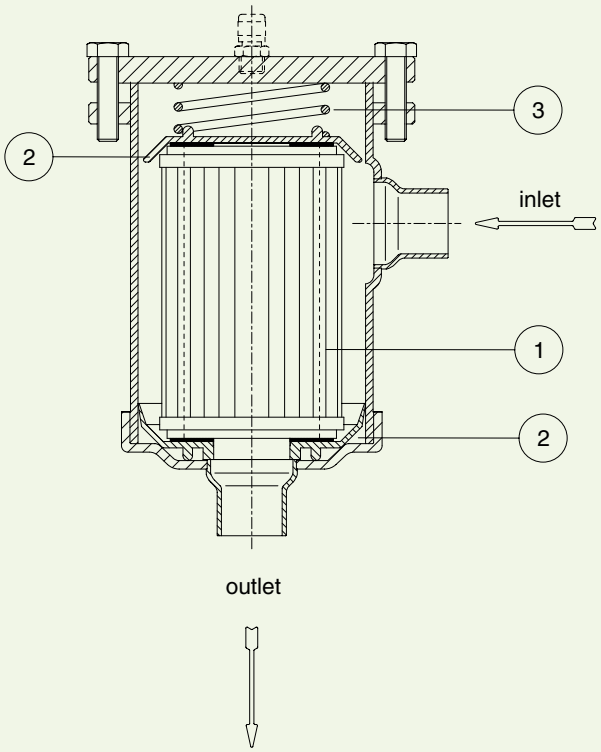
$$0,23 \times \frac{130^2}{162^2} = 0,148 \quad [bar]$$

Remember that the dimensioning of the suction line in a refrigerating system requires great attention.
In fact the relative pressure loss, included filter, which implies a reduction of flow capacity sucked by the compressor, influences directly the refrigerating capacity of the plant.
This line is normally sized to have a total pressure loss lower then a variation of the saturation temperature of 1° C.
For example diagram 1, referred to R22, allows to estimate the aforesaid variation in function of pressure loss and evaporating temperature.
After all it’s always important to remember that the refrigerant flow capacity of a compressor, under the other same conditions, can reduce considerably

because of the decrease of the saturation temperature, consequent to the pressure loss in the suction line.
To such purpose diagram 2 illustrates the existing relation between saturation temperature, in the suction line, and variation of the refrigerant flow capacity of a compressor.

TABLE 1: General Characteristics

Catalogue Number	Core Cat. Number	Number of Cores	Core Filtering Surface [cm²]	Connections			TS [°C]		PS [bar]	Risk Category according to PED
				ODS		W				
				Ø [in.]	Ø [mm]	Ø [mm]	min.	max.		
4411/7C	4495/C	1	820	7/8"	22	–	– 40	+80	32	I
4411/9C				1.1/8"	–					
4411/11C				1.3/8"	35					
4411/13C				1.5/8"	–					
4411/M42C				–	42					
4411/17C				2.1/8"	54					
4411/21C				2.5/8"	–					
4421/21C	4496/C		1850	2.5/8"	–	76,1				
4421/25C				3.1/8"	–	88,9				
4421/M80C				–	80	88,9				
4421/33C				4.1/8"	–	114,3				



Sketch of filter with mechanical block
1 – Block
2 – Retainer cup
3 – Spring

DIAGRAM 1

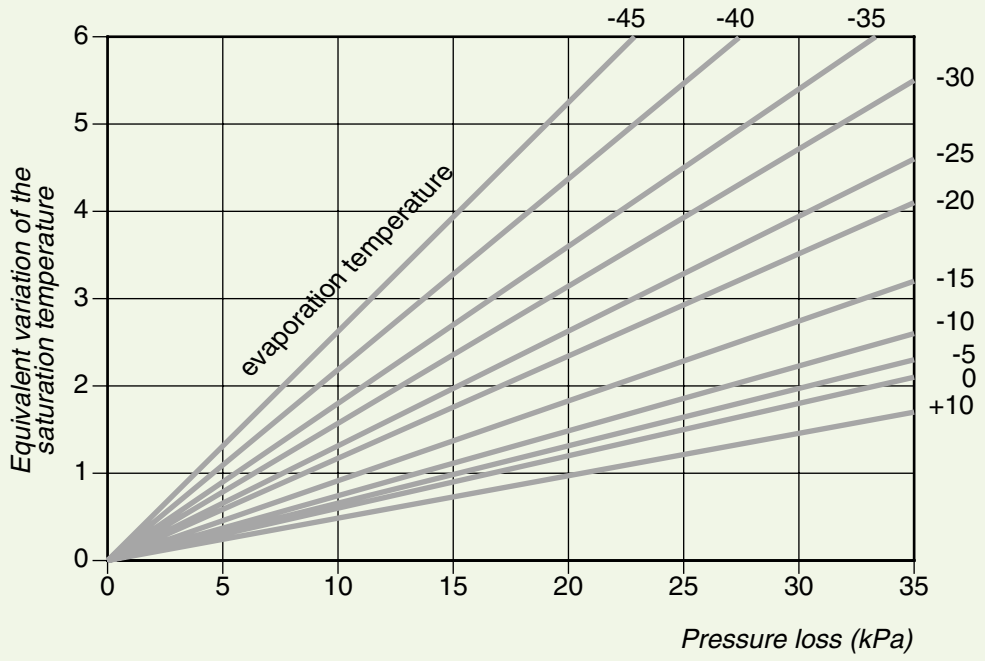


DIAGRAM 2

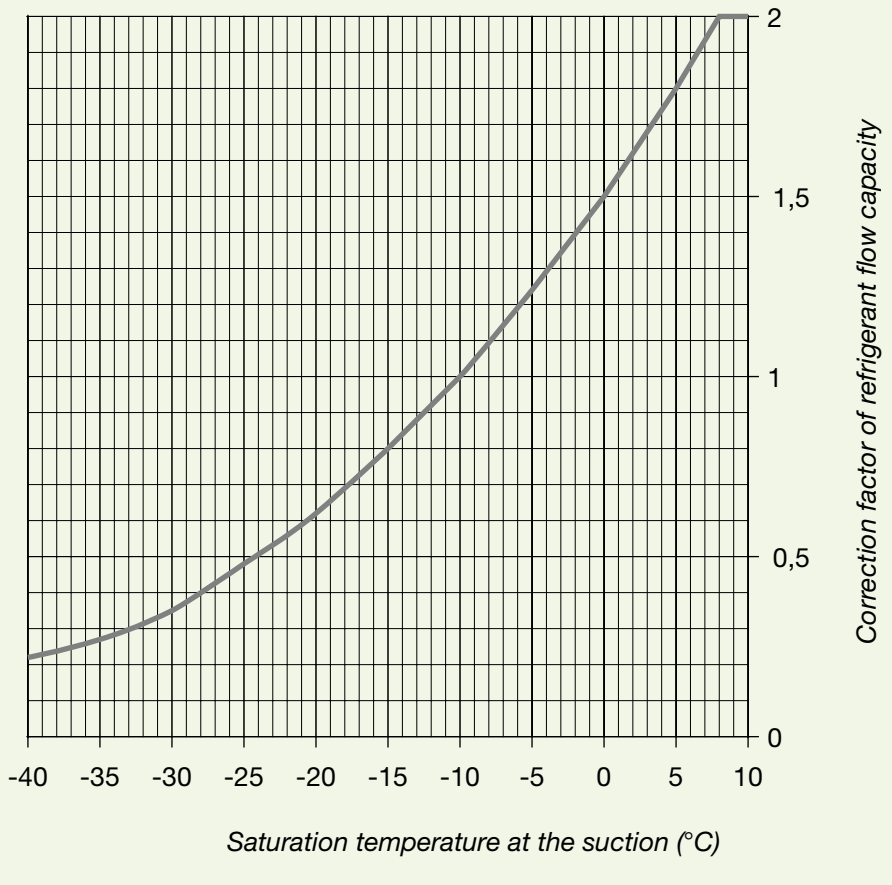


TABLE 2: Refrigerant Flow Capacity and Pressure Drop

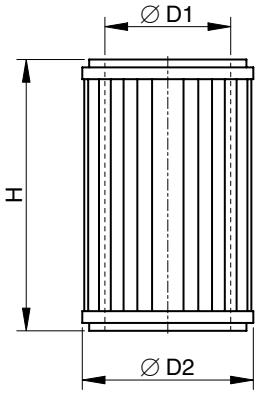
Catalogue Number	Refrigerant	Evaporating Temperature [°C]									
		+5		0		-10		-20		-30	
		[kW]	[bar]	[kW]	[bar]	[kW]	[bar]	[kW]	[bar]	[kW]	[bar]
4411/7C	R134a	17,0	0,084	13,7	0,070	9,0	0,048	6,0	0,033	3,5	0,021
	R22	26,0	0,120	21,5	0,100	15,6	0,074	10,8	0,052	7,2	0,037
	R404A	23,7	0,150	20,0	0,130	14,0	0,090	9,0	0,060	6,0	0,040
	R407C	22,2	0,100	19,0	0,090	12,8	0,060	8,4	0,043	5,1	0,028
4411/9C	R134a	28,7	0,091	23,0	0,074	15,0	0,051	10,0	0,035	6,0	0,022
	R22	43,0	0,130	36,4	0,110	26,0	0,080	18,0	0,056	12,0	0,040
	R404A	40,0	0,160	34,0	0,140	24,0	0,100	15,0	0,070	10,0	0,050
	R407C	37,6	0,110	32,1	0,100	21,3	0,066	14,2	0,047	8,7	0,031
4411/11C	R134a	43,5	0,092	35,0	0,075	23,0	0,052	15,0	0,036	9,0	0,023
	R22	65,0	0,130	55,0	0,110	39,0	0,080	27,0	0,056	18,0	0,040
	R404A	60,7	0,160	51,4	0,140	36,2	0,100	22,7	0,070	14,5	0,050
	R407C	57,0	0,110	48,6	0,100	33,2	0,068	21,9	0,047	13,4	0,031
4411/13C 4411/M42C	R134a	62,0	0,110	50,0	0,090	33,0	0,062	21,4	0,043	13,0	0,027
	R22	93,0	0,150	79,0	0,130	56,0	0,090	39,0	0,064	26,0	0,046
	R404A	86,8	0,200	73,5	0,170	51,7	0,120	32,4	0,080	20,7	0,060
	R407C	81,4	0,136	69,5	0,120	47,5	0,080	31,3	0,056	19,2	0,037
4411/17C	R134a	108,3	0,170	87,0	0,140	57,2	0,100	37,3	0,070	22,4	0,040
	R22	162,0	0,230	137,0	0,190	97,0	0,150	66,4	0,100	44,0	0,070
	R404A	151,3	0,310	128,0	0,270	90,0	0,190	56,5	0,130	36,0	0,100
	R407C	141,7	0,210	121,1	0,180	82,6	0,125	54,4	0,087	33,4	0,057
4411/21C	R134a	167,0	0,300	133,5	0,250	87,5	0,180	57,0	0,120	34,3	0,070
	R22	249,0	0,420	211,0	0,360	149,0	0,270	102,0	0,180	68,0	0,120
	R404A	232,7	0,550	197,0	0,480	138,6	0,330	87,0	0,230	55,5	0,170
	R407C	218,0	0,380	186,4	0,330	127,0	0,210	83,7	0,150	51,4	0,100
4421/21C	R134a	167,0	0,120	133,5	0,100	87,5	0,070	57,0	0,050	34,3	0,030
	R22	249,0	0,170	211,0	0,150	149,0	0,110	102,0	0,074	68,0	0,050
	R404A	232,7	0,220	197,0	0,200	138,6	0,130	87,0	0,100	55,5	0,070
	R407C	218,0	0,160	186,4	0,140	127,0	0,090	83,7	0,060	51,4	0,040
4421/25C 4421/M80C	R134a	238,0	0,210	191,0	0,180	125,0	0,120	81,5	0,090	49,0	0,050
	R22	256,0	0,300	302,0	0,260	213,0	0,190	146,0	0,130	97,0	0,090
	R404A	332,0	0,390	281,0	0,340	198,0	0,220	124,0	0,170	79,3	0,120
	R407C	312,0	0,270	266,0	0,230	182,0	0,150	119,7	0,100	73,5	0,070
4421/33C	R134a	416,0	0,630	334,0	0,540	218,0	0,360	142,0	0,270	85,0	0,150
	R22	623,0	0,900	528,0	0,770	372,0	0,570	255,0	0,390	170,0	0,270
	R404A	581,0	1,170	491,0	1,000	346,0	0,660	217,0	0,500	138,7	0,360
	R407C	547,0	0,790	468,0	0,690	320,0	0,440	210,0	0,300	129,0	0,200

Refrigerant flow capacities and pressure drops are referred to the following working conditions:

- *Liquid temperature ahead expansion valve: + 35 °C*
- *Overheating of suction gas: 6 °C*

TABLE 3: Dimensions and Weights

Catalogue Number	Connections			Dimensions [mm]						Weight [g]
	ODS		W							
	Ø [in.]	Ø [mm]	Ø [mm]	Ø D_1	Ø D_2	H_1	H_2	H_3	P	
4411/7C	7/8"	22	–	123	154	149	236	185	93	5450
4411/9C	1.1/8"	–								5375
4411/11C	1.3/8"	35				154	241		98	5435
4411/13C	1.5/8"	–				159	246		103	5410
4411/M42C	–	42								
4411/17C	2.1/8"	54				169	256		113	5585
4411/21C	2.5/8"	–				184	271		128	6030
4421/21C	2.5/8"	–	76,1	163	200	187	308	200	143	12000
4421/25C	3.1/8"	–	88,9			192	313		148	12200
4421/M80C	–	80	88,9							
4421/33C	4.1/8"	–	114,3							12500



4495 - 4496

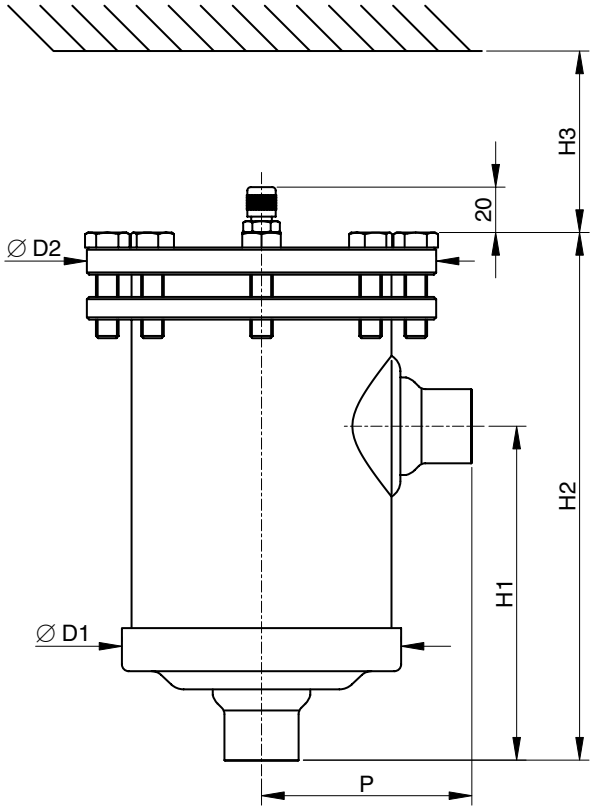


TABLE 4: General Characteristics Dimensions and Weights

Catalogue Number	Filtering Surface		Dimensions [mm]			Weight [g]
	[sq.in]	[cm^2]	Ø D_1	Ø D_2	H	
4495/C	127	820	60	87	138	480
4496/C	287	1850	80	113	168	750

STRAINERS

APPLICATIONS

The filters, shown in this chapter, are classified “Pressure vessels” in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.1 and are subject of Article 3, Section 1.1 of the same Directive. They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use refrigerant fluids proper to the Group II (as defined in Article 9, Section 2.2 of Directive 97/23/EC and referred to in Directive 67/548/EEC).

CONSTRUCTION

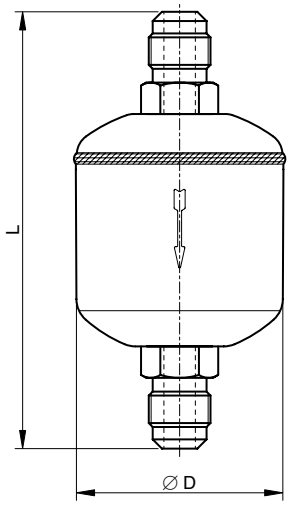
The filter is completely manufactured in steel, either with nickel-plated Flare threaded connections. The product range also includes types with copper plated solder connections, offering the possibility to solder the copper pipe inside the connections (ODS) or outside the connections, using a copper sleeve (ODM). Inside the filters there is a screen basket, with wide filtering surface, made of austenitic stainless steel AISI 304. These filters may not be cleaned.

TABLE 1: General Characteristics

Catalogue Number	Filtering Surface [cm²]	Useful Passage Surface [%]	Mesh Opening [mm]	Connections					Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category according to PED
				SAE Flare	ODS		ODM			min.	max.		
					Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]					
4510/3	58	36,6	0,166	3/8"	–	–	–	–	2,4	– 40	+80	42	Art. 3.3
4510/4	142			1/2"	–	–	–	–	3,2				
4520/3	58			–	3/8"	–	1/2"	–	2,4				
4520/M10				–	–	10	–	12					
4520/M12				–	–	12	–	14	3,4				
4520/4				–	1/2"	–	5/8"	16					
4520/5				–	5/8"	16	3/4"	–					
4520/M18	142			–	–	18	–	22	8,0				

TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]		Weight [g]
	Ø D	L	
4510/3	52	110	195
4510/4	76	174	515
4520/3	52	109	195
4520/M10			
4520/M12		113	205
4520/4		122	215
4520/5		126	245
4520/M18	76	170	495



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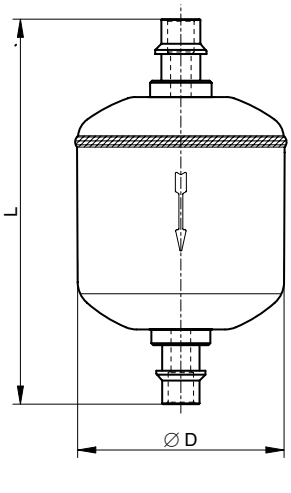

4520

DESSICCANTS

For using on refrigerating systems, Castel puts the following desiccants at disposal of its own customers:

- Activated alumina Code No 4901/AA
- Molecular sieve Code No 4901/MS
- Silicagel Code No 4901/SG

hermetically sealed in steel cans with a weight of about 0,750 kg and supplied in multiply package of 15 cans.