APPLICATIONS

The valves illustrated herein are designed for use with different fluids. They can be used for applications as specified in Table 1 where the different fluids are indicated with the following symbols according to an already established code:
W = Water
L = Air
B = Secondary coolants (solutions of glycol and water)
O = Light oils (gas oil)

OPERATION

All valves are normally closed – N.C.: when the coil is de-energised there is no flow.

MATERIALS

The materials used for the main parts of the valves are:

- ST-UNI EN 12165 - CW 617 N hot-forged brass for the main body;
- austenitic stainless steel – AISI 305 for the enclosure in which the plunger can move;
- ferritic stainless steel – AISI 430 F with controlled magnetic properties for the plunger;
- nitril rubber (NBR) for outer seal gaskets;
- fluorocarbon rubber (FPM) for seat gaskets.

INSTALLATION

Before connecting the valve to pipework it is advisable to make sure that the line voltage corresponds to the voltage stamped on the coil and that pipings are clean. Furthermore, flow direction must correspond with the arrow stamped on the valve body. All valves can be installed in any position except with the coil pointing downwards.

Connectors are not included in the boxes and have to be ordered separately.

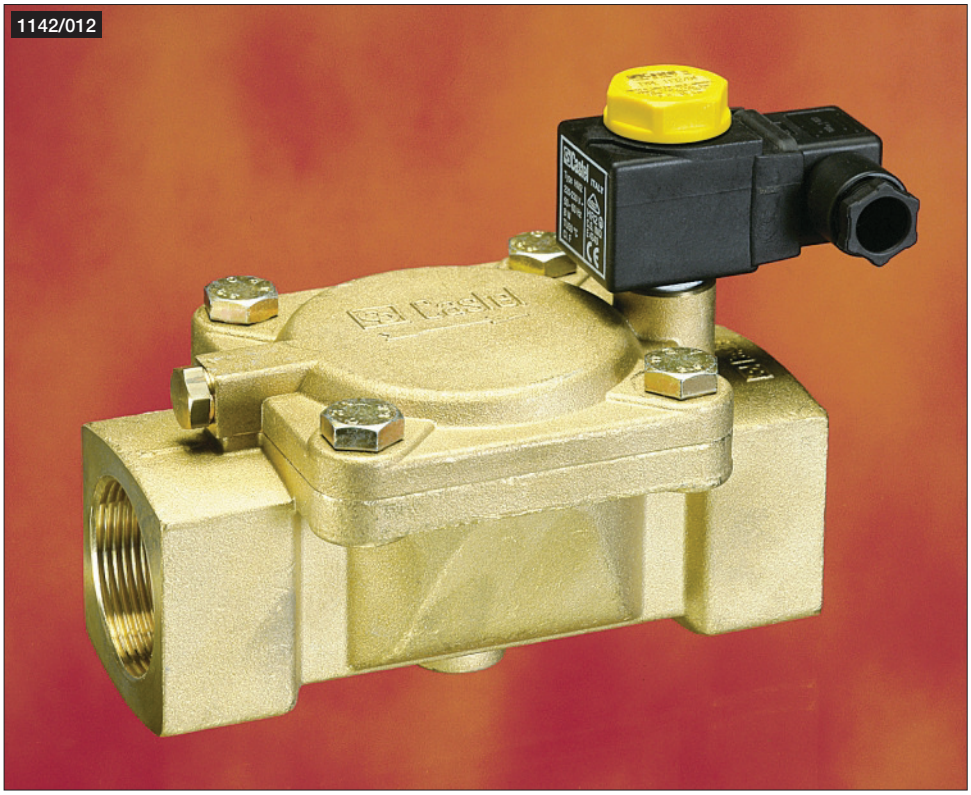


TABLE 1 - General Characteristics

Catalogue Number	Coils		Main use	Connectors FPT	Nominal orifice Ø [mm]	Opening pressure differential (1) [bar]		Fluid Temperature [°C]		Operating principles		kv Factor [m³/h]	Max Pressure [bar]
	Type	Degree of protection				min	max. (MOPD)	min	max	Direct operated	servo operated		
1132/03	HM2 (A.C.) CM2 (A.C.) HM3 (D.C.)	IP - 65 EN 60529	W.L.O.B.	G 3/8"	12,5	0,10	17	– 15	+ 110		☆	2,10	30
1132/04				G 1/2"								2,20	
1132/06				G 3/4"	20	0,15	12					5,50	15
1132/08				G 1"								6,00	
1142/010				G 1.1/4"	38	0,30	11		+ 90			19,00	
1142/012				G 1.1/2"								21,00	
1512/01			W.L.O.	G 1/8"	1,5	0	30		+110	☆		0,07	30
1522/02			W.O.	G 1/4"	4,5		4						
1522/03				G 3/8"								0,40	
1522/04				G 1/2"									

(1) Opening pressure differential:
– min = the minimum pressure differential at which the valve is fully open.
– max = Maximum Opening Pressure Differential at which a valve opens (it corresponds to MOPD in ARI STANDARD 760-87).

VISCOSITY

The values of maximum differential pressure specified in Table 1 are suitable for fluids with maximum cinematic viscosity of 12 cSt where

$1cSt = 10^{-6}\ m^2/sec.$

If the cinematic viscosity of the fluid under consideration is more than 12 cSt it is necessary to multiply the value of the maximum differential pressure by the following reducing factors:

Viscosity cSt	Reducing Factor
12	1
12 ÷ 30	0,8
30 ÷ 45	0,7

When the viscosity of the liquid is expressed as dynamic viscosity, i.e. cP, where:

$1cP = 10^{-3}\ N\ sec/m^2$

the corresponding value of cinematic viscosity in cSt is obtained by the following relation:

$$\nu = \frac{\mu}{\rho}$$

dove:

ν = cinematic viscosity [cSt]

μ = dynamic viscosity [cP]

ρ = volumic mass of the fluid at the considered temperature [kg/dm³]

Moreover, the fluid viscosity may remarkably vary according to changes in temperature. Therefore, if the temperature of the fluid does not ensure viscosity values compatible with the correct operation of the valve, the valve may not open.

LIQUIDS CAPACITY

The following ratio applies:

$$Q = kv\ \sqrt{\frac{\Delta p}{\rho}}$$

where:

kv = kv factor of the valve [m³/h]

Q = capacity [m³/h]

Δp = pressure drop through the valve [bar];

ρ = volumic mass of the liquid [kg/dm³].

AIR CAPACITY

Table 2 provides the values of air capacity under the following conditions

- temperature at valve inlet = 20 °C;
- discharge pressure (absolute) = 1 bar;
- kv factor of the valve under consideration = 1 m³/h.

The pressures upstream the valve specified in the table are absolute values.

EXAMPLE

Select the valve suitable for use with approximately 200 m³/h of air, assuming an absolute pressure of 8 bars at valve inlet (= 7 bars of relative pressure + 1 bar) and an acceptable pressure drop across the valve of 1.5 bars. In the column of pressures upstream the valve, the value 8 is shown; where this column intersects the horizontal column relating to the pressure drop of 1.5, the value of 87 m³/h is shown. This is the capacity value of a hypothetical valve with kv = 1 working under the above mentioned conditions.

200 / 87 = 2.29

This is the kv value required in the case under consideration. In Table 1, select the valve with the kv value nearest to 2.29, rounding off the value and subsequently checking that all the characteristics of the selected valve (max. opening pressure differential, temperature, connections, etc.) are suitable.

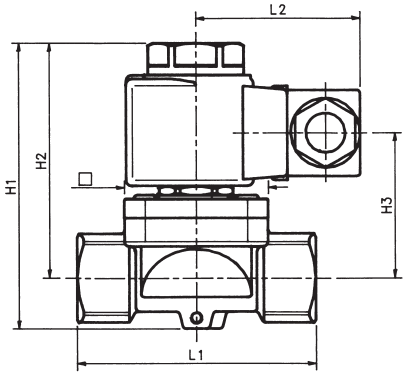
TABLE 2 - Air Capacity (kv = 1)

Pressure drop [bar]	CAPACITY [m³/h] (1) INLET PRESSURE (assolute) [bar]																							
	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1,5	1,3	1,2	1,1	1,05	1,03	1,015
0,0025																					1,46	1,42	1,40	1,35
0,005																				2,2	2,10	2,00	1,95	1,90
0,010																			3,0	3,0	3,00	2,85	2,80	2,75
0,015																		4,2	3,9	3,7	3,55	3,45	3,40	3,35
0,025																	6,2	5,4	5,0	4,8	4,56	4,45	4,40	
0,05																10,7	8,7	7,5	6,9	6,6	6,40	6,20		
0,10															17,4	15,0	12,2	10,2	9,6	9,2	8,80			
0,15														23,8	21,2	18,3	14,6	12,5	11,5	11,0				
0,25													33,4	30,4	27,0	23,2	18,5	15,6	13,9					
0,5	82,0	80,0	77,0	74,0	72,0	69,5	66,6	63,7	60,6	57,3	54,0	50,0	46,0	41,7	36,8	31,0	24,3	19,6						
1	115,0	111,0	108,0	104,0	100,0	96,0	92,0	88,0	83,0	78,6	73,5	68,0	62,0	55,6	48,0	39,3	27,8							
1,5	138,0	134,0	130,0	125,0	120,0	115,5	110,3	105,0	99,3	93,0	87,0	80,0	72,0	63,7	53,8	41,7								
2	157,0	152,0	147,0	142,0	136,0	130,0	124,0	118,0	111,0	96,0	96,0	88,0	78,0	68,0	55,6									
2,5	173,0	167,5	161,5	155,5	149,0	142,5	135,5	128,0	120,4	112,0	103,0	89,5	82,0	69,5										
3	186,0	180,0	174,0	167,0	160,0	152,0	144,5	136,0	127,0	118,0	108,0	96,0	83,0											
3,5	198,0	191,0	184,0	176,5	168,6	160,3	151,7	142,5	132,6	122,0	110,0	97,0												
4	208,0	200,0	193,0	184,0	176,0	167,0	157,0	147,0	136,0	124,0	111,0													
4,5	216,0	208,6	200,0	191,0	182,0	172,0	161,5	150,4	138,0	125,0														
5	224,0	215,0	206,0	195,5	186,0	176,0	164,5	152,3	139,0															
5,5	230,0	221,0	211,0	201,0	190,0	178,6	166,3	152,9																
6	236,0	226,0	215,0	204,0	192,7	180,0	166,8																	
6,5	240,0	230,0	218,0	206,7	194,0	180,7																		
7	244,0	233,0	220,0	208,0	194,7																			
7,5	246,0	234,0	222,0	208,5																				
8	249,0	236,0	222,5																					
8,5	250,0	236,5																						
9	250,5																							

(1) The table provides air capacity values in m³/h under the following conditions:
- temperature at valve inlet: + 20 °C
- pressure at outlet (absolute): 1 bar
- kv of the solenoid valve: 1 m³/h

TABLE 3 - Dimensions and Weights (Valves with HM2 coils)							
Catalogue Number	Dimensions [mm]						Weight [g]
	H_1	H_2	H_3	L_1	L_2	❑	
1132/03	86	70	47	75	50	45	670
1132/04							635
1132/06	101	81	52	88		57	960
1132/08							670
1142/010	136	103	82	168	104	104	4100
1142/012							4000
1512/01	69	57	34	44		–	310
1522/02	71	59	36	51	50	–	385
1522/03							370
1522/04							355

For coils 9120 the dimension L_2 is equal to 64 mm and the weight must be increased of 305 g.



1132/03
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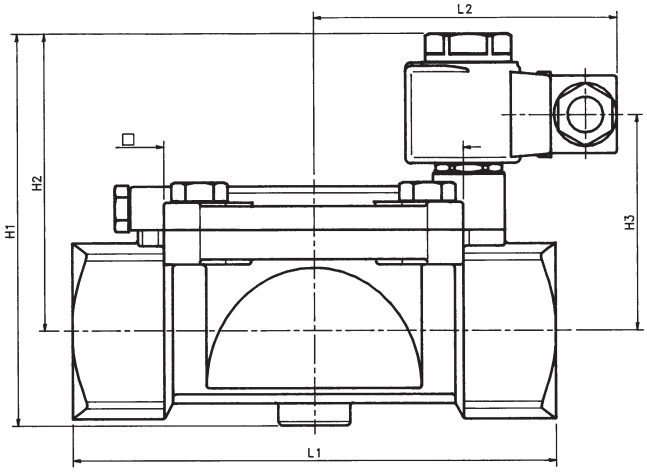

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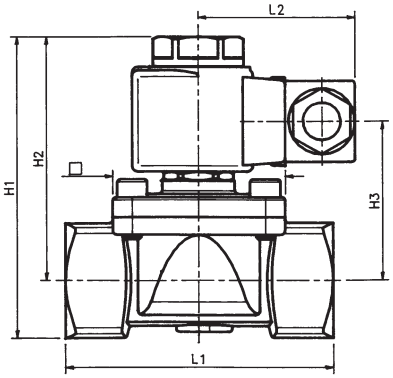

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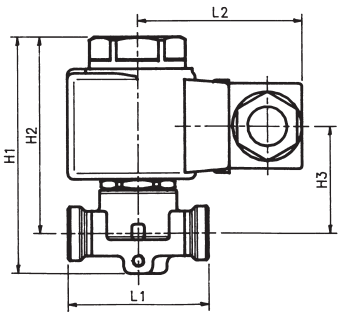

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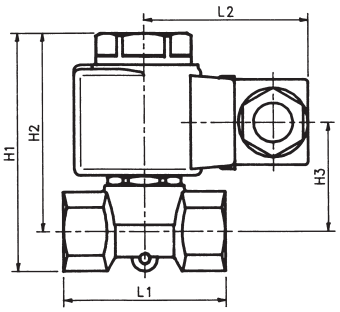

1522/02
1522/03
1522/04

Connectors are not included in the boxes to be ordered separately.