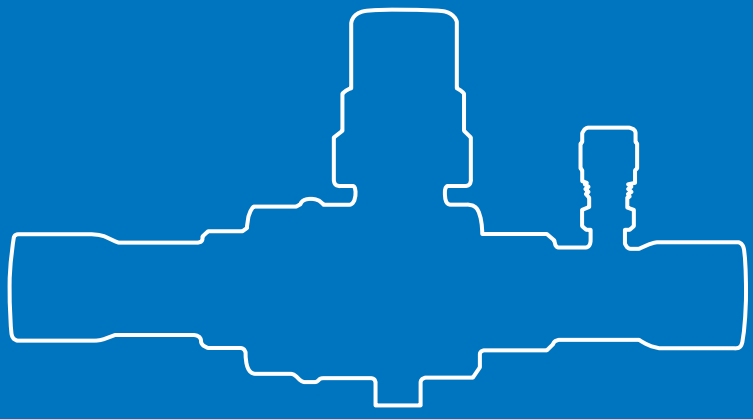


HANDBOOK

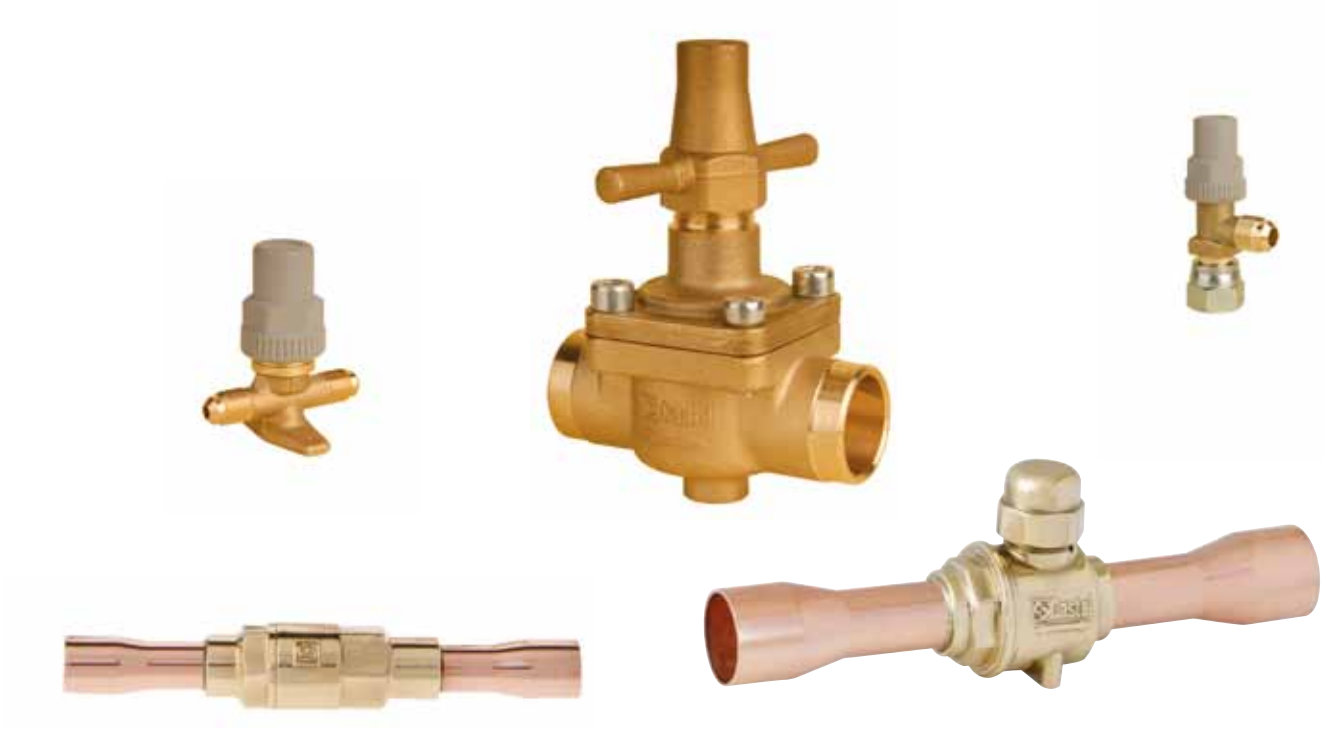
VALVES FOR REFRIGERATING SYSTEMS

Castel®
Italian technology

INDEX

FROM QUALITY OUR NATURAL DEVELOPMENT

Achieved the goal of fifty years working in the industry of Refrigeration and Air Conditioning, Castel Quality Range of Products is well known and highly appreciated all over the world. Quality is the main issue of our Company and it has a special priority, in every step, all along the production cycle. UNI EN ISO 9001:2008, issued by ICIM, certifies the Quality System of the Factory. Moreover Castel Products count a number of certifications in conformity with EEC Directives and with European and American Quality Approval.
We produce on high tech machinery and updated automatic production lines, operating in conformity with the safety and environment standards currently enforced.
Castel offers to the Refrigeration and Air Conditioning Market and to the Manufacturers fully tested products suitable with HCFC and HFC Refrigerants currently used in the Refrigeration & Air Conditioning Industry.



External leakage

All the products illustrated in this Handbook are submitted, one by one, to tightness tests besides to functional tests. Allowable external leakage, measurable during the test, agrees to the definition given in Par. 9.4 of EN 12284 : 2003 Standard:
"During the test, no bubbles shall form over a period of at least one minute when the specimen is immersed in water with low surface tension, …".

Pressure containment

All the products illustrated in this Handbook, if submitted to hydrostatic test, guarantee a pressure strength at least equal to 1,43 x PS in compliance with the Directive 97/23/EC.
All the products illustrated in this Handbook, if submitted to burst test, guarantee a pressure strength at least equal to 3 x PS according to EN 378-2 : 2008 Standard.
A great number of products illustrated in this Handbook can guarantee an higher pressure strength, equal to 5 x PS according the UL Standard 207: 2009.

Weight

The weights of the items listed in this Handbook include packaging.

Guarantee

All Castel products are covered by a 12 – months warranty. This warranty covers all products or parts thereof that turn out to be defective within the warranty period. In this case, at his own expenses, the customer shall return the defective item with a detailed description of the claimed defects. The warranty doesn't apply if the defect of Castel products are due to mistakes either by customer or by third parties such wrong installations, use contrary to Castel indications, tampering. In case of defects of its own products, Castel will only replace the defective goods and will not refund damages of any kind.
The technical data shown on this catalogue are indicative. Castel reserves the right to modify the same at any time without any previous notice.

APPLICATIONS

The check valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

MATERIALS

The main parts of the valves are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body and cover
- Copper tube EN 12735-1 – Cu-DHP for solder connections
- Austenitic stainless steel AISI 302 for the spring
- Chloroprene rubber (CR) for outlet seal gaskets. Metal-rubber laminated gaskets for the valves series 3122, 3142 and 3182
- P.T.F.E. for seat gasket

INSTALLATION

The valves can be installed in any section of a refrigerating system, where it is necessary to avoid an inversion of the refrigerating flow, in compliance with the limits and capacities indicated in table 2. Table 1 shows the following functional characteristics of a check valve.

- PS
- TS
- Kv factor
- Minimum opening pressure differential, which is the minimum pressure differential between inlet and outlet at which a check valve can open and stay opened.

Before connecting the valve to the pipe it is advisable to make sure that the refrigerating system is clean. In fact the valves with P.T.F.E. gaskets are particularly sensitive to dirt and debris. Furthermore check that the flow direction in the pipe corresponds to the arrow stamped on the body of the valve.
The allowed operating positions are:

- types 3122 and 3142 with horizontal axis and valve cover facing upward
- types 3182 with inlet facing down and the valve cover facing upward
- types 3112, 3132 and 3133 preferably with vertical axis and arrow upward. Sloping axis, up to horizontal position, are tolerable.

The brazing of valves with solder connections should be carried out with care, using a low melting point filler material. Before starting to braze, it's necessary to disassemble the valves series 3122, while this operation is not necessary with solder connection valves. In any case, to avoid direct contact between the torch flame and the valve body, which could be damaged and compromise the proper functioning of the valve.

TABLE 1: General Characteristics

Catalogue Number	Connections					Kv Factor [m^3/h]	Minimum Opening Pressure Differential [bar]	PED Directive			
	SAE Flare	ODS		ODM				TS [°C]		PS [bar]	Risk Category
		Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]			min.	max.		
3112/2	1/4"	–	–	–	–	0,5	0,1	– 40	+105	45	Art. 3.3
3112/3	3/8"					1,5					
3112/4	1/2"					1,8					
3112/5	5/8"					3,3					
3112/6	3/4"					5,0					
3122/M22	–	–	22	–	28	6,6	0,1	– 35	+160	45	
3122/7		7/8"	–	1.1/8"	–						
3122/M28		–	28	1.3/8"	35	8,8					
3122/9		1.1/8"	–	1.3/8"	35						
3122/11		1.3/8"	35	1.5/8"	–	15,2					
3122/13		1.5/8"	–	2"		25					I
3122/M42		–	42	2"							
3122/17		2.1/8"	54	–		40					
3132/2		1/4"	–			0,5	0,1	– 40	+105	45	Art. 3.3
3132/3		3/8"	–			1,5					
3132/M10		–	10								
3132/M12		–	12			1,8					
3132/4		1/2"	–								
3132/5		5/8"	16			3,3					
3132/M18		–	18			5,0					
3132/6		3/4"	–								
3132/7		7/8"	22								
3133/M10		–	10			1,5	0,3				
3133/M12		–	12			1,8					
3133/5		5/8"	16			3,3					
3133/7		7/8"	22			5,0					
3142/7		7/8"	22	–		6,6	0,1	+35	+160	45	
3142/M28		–	28			8,8					
3142/9		1.1/8"	–								
3142/11		1.3/8"	35			15,2					
3142/13		1.5/8"	–			25,0					
3142/M42		–	42								
3142/17		2.1/8"	54			40					
3142/21		2.5/8"	–								
3142/25		3.1/8"	–								
3182/7		7/8"	22			8,5					Art. 3.3
3182/M28		–	28			9,5					
3182/9		1.1/8"	–								
3182/11		1.3/8"	35			19					
3182/13		1.5/8"	–			37,0					I
3182/M42		–	42								
3182/17		2.1/8"	54			45,4					

TABLE 2: Refrigerant Flow Capacity [kW]

Catalogue Number	Liquid line						Suction line						Hot Gas line					
	R134a	R22	R404A	R407C	R410A	R507	R134a	R22	R404A	R407C	R410A	R507	R134a	R22	R404A	R407C	R410A	R507
3112/2	8,5	9,2	6,0	8,6	8,6	5,8	0,9	1,3	1,1	1,1	1,5	1,1	4,3	5,4	4,8	5,8	6,8	4,8
3112/3	25,5	27,5	17,9	25,8	25,8	17,3	2,8	3,8	3,3	3,4	4,5	3,3	12,8	16,2	14,4	17,4	20,4	14,3
3112/4	30,6	32,9	21,4	31,0	30,9	20,7	3,4	4,6	4,0	4,1	5,4	4,0	15,3	19,4	17,3	20,9	24,5	17,2
3112/5	56,1	60,4	39,3	56,9	56,7	38,0	6,2	8,4	7,4	7,5	9,9	7,4	28,1	35,6	31,7	38,3	44,9	31,5
3112/6	85,0	91,5	59,5	86,2	85,9	57,5	9,5	12,8	11,2	11,4	15,0	11,2	42,5	54,0	48,0	58,1	68,0	47,7
3122/M22	112,2	120,8	78,5	113,7	113,3	75,9	12,5	16,8	14,7	15,0	19,8	14,7	56,1	71,3	63,4	76,7	89,8	63,0
3122/7																		
3122/M28	149,6	161,0	104,7	151,6	151,1	101,2	16,6	22,4	19,6	20,0	26,4	19,6	74,8	95,0	84,5	102,3	119,7	84,0
3122/9																		
3122/11	258,4	278,2	180,9	261,9	261,0	174,8	28,7	38,8	33,9	34,5	45,6	33,9	129,2	164,2	145,9	176,6	206,7	145,0
3122/13	425,0	457,5	297,5	430,8	429,3	287,5	47,3	63,8	55,8	56,8	75,0	55,8	212,5	270,0	240,0	290,5	340,0	238,5
3122/M42																		
3122/17	680,0	732,0	476,0	689,2	686,8	460,0	75,6	102,0	89,2	90,8	120,0	89,2	340,0	432,0	384,0	464,8	544,0	381,6
3132/2	8,5	9,2	6,0	8,6	8,6	5,8	0,9	1,3	1,1	1,1	1,5	1,1	4,3	5,4	4,8	5,8	6,8	4,8
3132/3	25,5	27,5	17,9	25,8	25,8	17,3	2,8	3,8	3,3	3,4	4,5	3,3	12,8	16,2	14,4	17,4	20,4	14,3
3132/M10																		
3132/M12	30,6	32,9	21,4	31,0	30,9	20,7	3,4	4,6	4,0	4,1	5,4	4,0	15,3	19,4	17,3	20,9	24,5	17,2
3132/4																		
3132/5	56,1	60,4	39,3	56,9	56,7	38,0	6,2	8,4	7,4	7,5	9,9	7,4	28,1	35,6	31,7	38,3	44,9	31,5
3132/M18	85,0	91,5	59,5	86,2	85,9	57,5	9,5	12,8	11,2	11,4	15,0	11,2	42,5	54,0	48,0	58,1	68,0	47,7
3132/6																		
3132/7																		
3133/M10	25,5	27,5	17,9	25,8	25,8	17,3	2,8	3,8	3,3	3,4	4,5	3,3	12,8	16,2	14,4	17,4	20,4	14,3
3133/M12	30,6	32,9	21,4	31,0	30,9	20,7	3,4	4,6	4,0	4,1	5,4	4,0	15,3	19,4	17,3	20,9	24,5	17,2
3133/5	56,1	60,4	39,3	56,9	56,7	38,0	6,2	8,4	7,4	7,5	9,9	7,4	28,1	35,6	31,7	38,3	44,9	31,5
3133/7	85,0	91,5	59,5	86,2	85,9	57,5	9,5	12,8	11,2	11,4	15,0	11,2	42,5	54,0	48,0	58,1	68,0	47,7
3142/7	112,2	120,8	78,5	113,7	113,3	75,9	12,5	16,8	14,7	15,0	19,8	14,7	56,1	71,3	63,4	76,7	89,8	63,0
3142/M28	149,6	161,0	104,7	151,6	151,1	101,2	16,6	22,4	19,6	20,0	26,4	19,6	74,8	95,0	84,5	102,3	119,7	84,0
3142/9																		
3142/11	258,4	278,2	180,9	261,9	261,0	174,8	28,7	38,8	33,9	34,5	45,6	33,9	129,2	164,2	145,9	176,6	206,7	145,0
3142/13	425,0	457,5	297,5	430,8	429,3	287,5	47,3	63,8	55,8	56,8	75,0	55,8	212,5	270,0	240,0	290,5	340,0	238,5
3142/M42																		
3142/17	680,0	732,0	476,0	689,2	686,8	460,0	75,6	102,0	89,2	90,8	120,0	89,2	340,0	432,0	384,0	464,8	544,0	381,6
3142/21																		
3142/25																		
3182/7	144,5	155,6	101,2	146,5	145,9	97,8	16,1	21,7	19,0	19,3	25,5	19,0	72,3	91,8	81,6	98,8	115,6	81,1
3182/M28	161,5	173,9	113,1	163,7	163,1	109,3	18,0	24,2	21,2	21,6	28,5	21,2	80,8	102,6	91,2	110,4	129,2	90,6
3182/9																		
3182/11	323,0	347,7	226,1	327,4	326,2	218,5	35,9	48,5	42,4	43,1	57,0	42,4	161,5	205,2	182,4	220,8	258,4	181,3
3182/13	629,0	677,1	440,3	637,5	635,3	425,5	69,9	94,4	82,5	84,0	111,0	82,5	314,5	399,6	355,2	429,9	503,2	353,0
3182/M42																		
3182/17	771,8	830,8	540,3	782,2	779,5	522,1	85,8	115,8	101,2	103,1	136,2	101,2	385,9	490,3	435,8	527,5	617,4	433,1

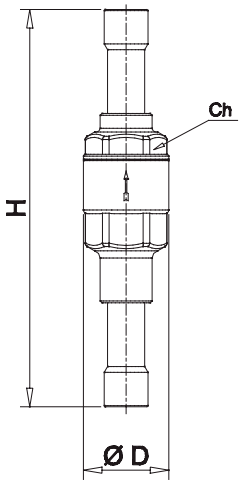
Standard rating conditions according to AHRI Standard 760-2007

Condensing temperature	110 °F	(43,3 °C)
Liquid temperature	100 °F	(37,8 °C)
Subcooling	10 °R	(5,5 °K)
Evaporating temperature	40 °F	(4,4 °C)
Suction temperature	65 °F	(18,3 °C)
Superheating	25 °R	(13,9 °K)
Discharge temperature	160 °F	(71,1 °C)

TABLE 3: Dimensions and Weights

Catalogue Number	Dimensions [mm]							Weight [g]
	H	H_1	L	L_1	Q	Ø D	Ch	
3112/2	56	–	–	–	–	19	16	86
3112/3	68					23	20	131
3112/4	73					25	22	166
3112/5	85					29	25	242
3112/6	98					36	32	400
3122/M22	84,5	28,5	100	–	60	–	–	1180
3122/7								
3122/M28								1090
3122/9								
3122/11	101,5	34	118		68			1625
3122/13	125,5	37	141		88			2955
3122/M42								
3122/17	142	42,5	173		104			4225
3132/2	92	–	–		–	19		111
3132/3	107					23		131
3132/M10								
3132/M12	132					25		171
3132/4								
3132/5	139					29		232
3132/M18	165					36		360
3132/6								
3132/7								
3133/M10	107					23		131
3133/M12	132					25		171
3133/5	139					29		232
3133/7	165					36		360
3142/7	84,5	28,5	170		60	–		1320
3142/M28			201					
3142/9								
3142/11	101,5	34	232		68			1885
3142/13	125,5	37	256		88			3315
3142/M42								
3142/17	142	42,5	285		104			4875
3142/21								
3142/25			329					5690
3182/7	151	95	130,5	100,5	60			1280
3182/M28								1295
3182/9								
3182/11	177	109,5	150	116	68			1855
3182/13	221	123,5	195,5	143,5	104			3255
3182/M42								
3182/17								4780

3132
3133



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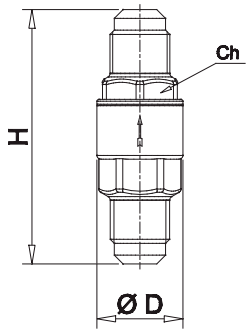

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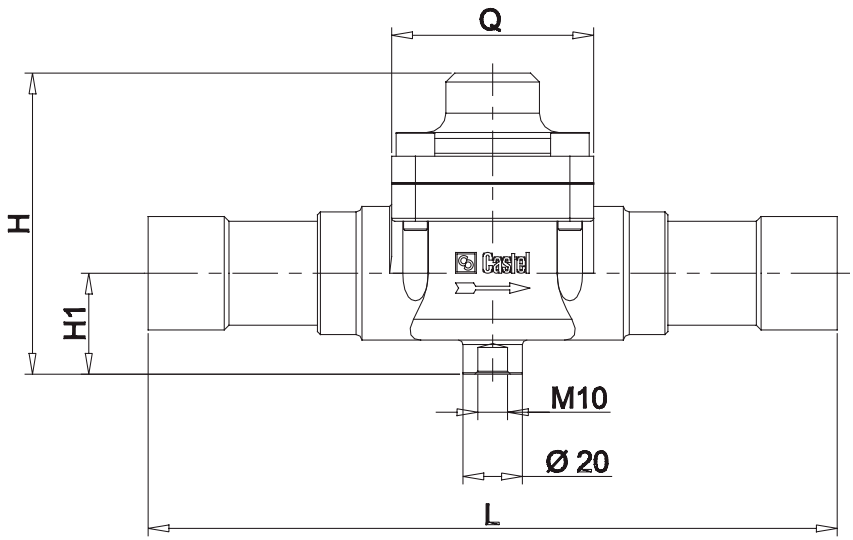

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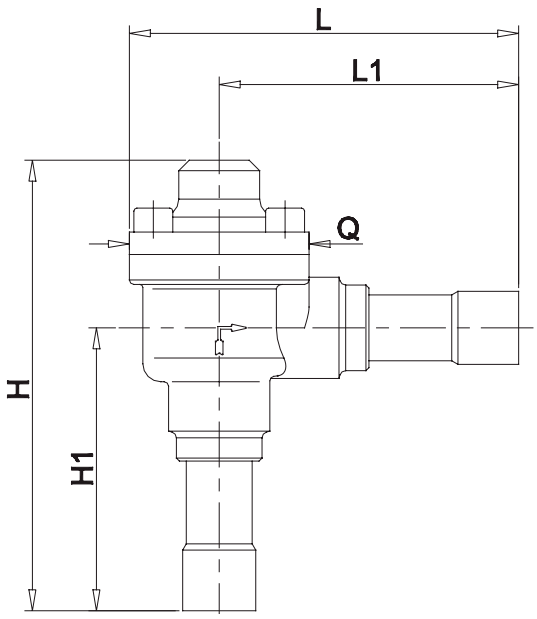

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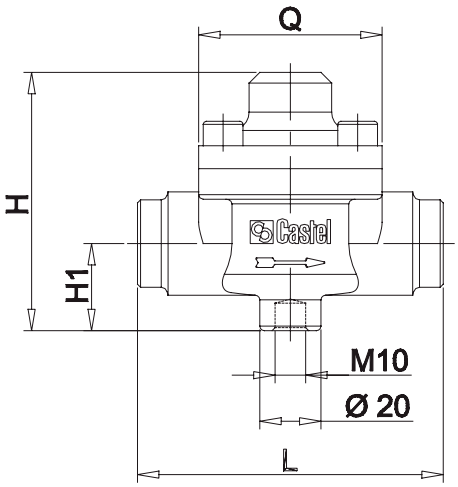


HERMETIC VALVES

APPLICATIONS

The hermetic valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive. They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

COSTRUCTION

These valves are available in the following two types:
- Two-ways shut-off valves types 6010/2 and 6012/22
- Three-ways valves; two main connections plus a third one for charging types:
- 6065, with right access connection
- 6075, with left access connection

N.B. : the third way must be equipped with a valve core (for example type 8394/A or other similar ones) to be ordered separately.

The main parts of the hermetic valves are made with the following materials:
- Hot forged brass EN 12420 – CW 617N for body
- Steel, with proper surface protection, or brass for the spindle
- Chloroprene rubber (CR) and aramidic fibers for gland seal
- Glass reinforced PBT for cap that covers the spindle

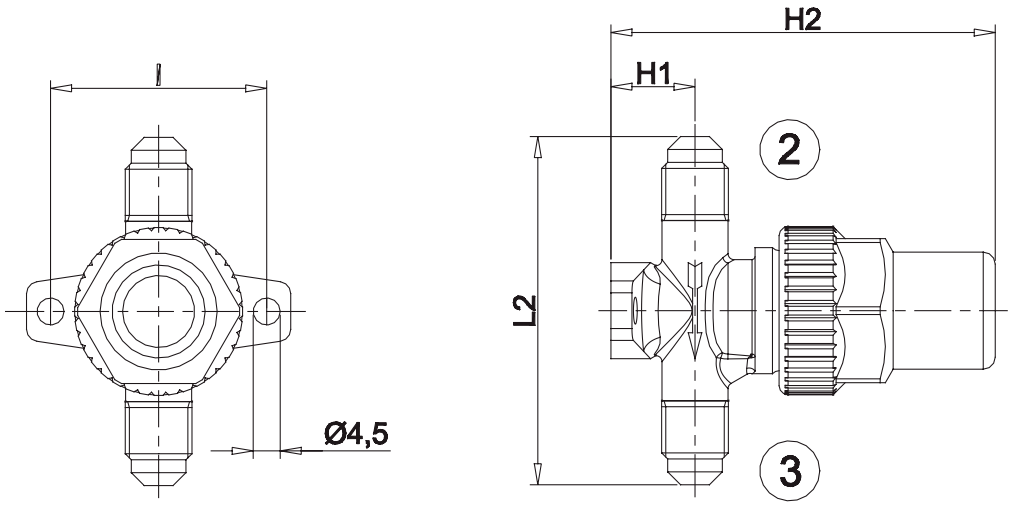
TABLE 1: General Characteristics

Catalogue Number	Connections					Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category
	SAE Flare			ODS						
	(1)	(2)	(3)	Ø [in.]	Ø [mm]		min.	max.		
6010/2	–	1/4"	1/4"	–	–	0,27	-40	+130	45	Art. 3.3
6012/22		1/4"	–	1/4"						
6020/222	1/4"	1/4"	1/4"	–		0,39		+110		
6020/233		3/8"	3/8"			1,20				
6020/244		1/2"	1/2"			2,20				
6020/255		5/8"	5/8"			2,80				
6062/22M6		1/4"	–		6	0,46				
6062/23M10		3/8"			10	1,38				
6072/22M6		1/4"			6	0,46				
6072/23M8		3/8"			8	1,29				
6072/23M10		3/8"			10	1,38				
6072/24M12		1/2"			12	2,55				
6072/25M16		5/8"			16	3,40				

TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]									Weight [g]
	H_1	H_2	H_3	H_4	H_5	I	L_1	L_2	P_1	
6010/2	14	66	–	–	–	36	–	58	–	160
6012/22							29	56		145
6020/222	25	51	61	115		–	62	–		360
6020/233			60				67			370
6020/244	27	52	68	127			77			520
6020/255							79			530
6062/22M6	26	31	57	–	1	–	25	72	31	205
6062/23M10		33	59							200
6072/22M6		31	57							205
6072/23M8		33	59							210
6072/23M10										220
6072/24M12	30	39	68					84	32	310
6072/25M16		40	69							320

6010



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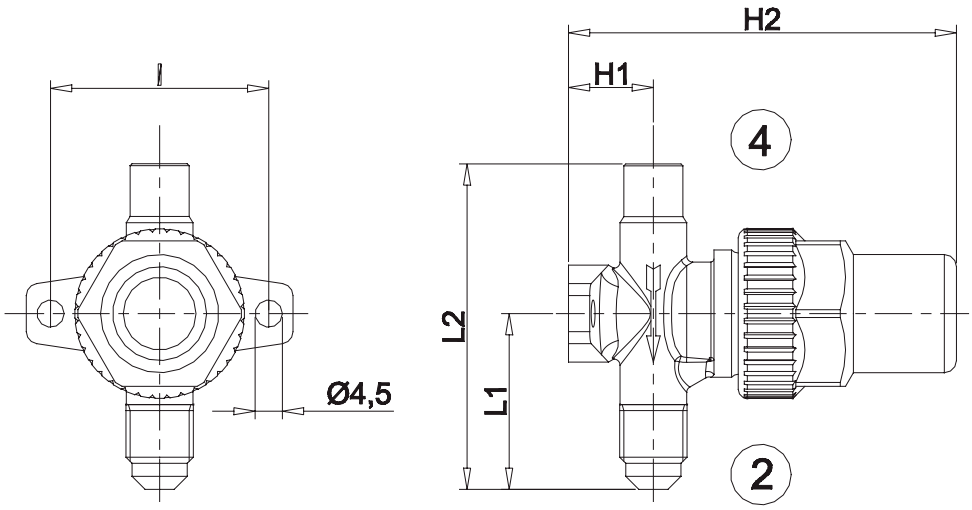

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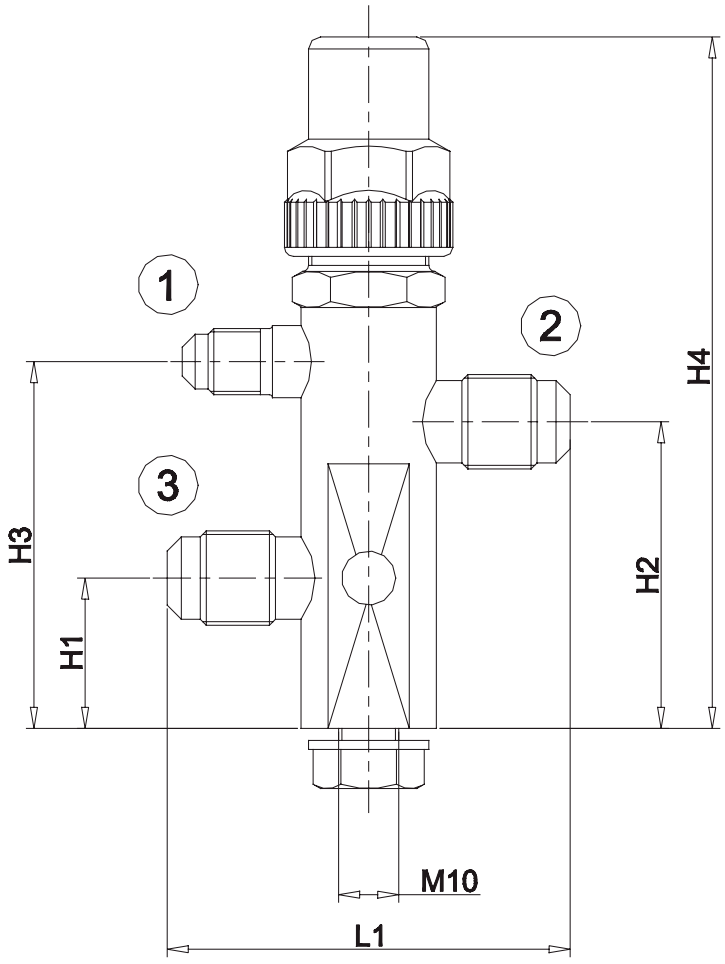

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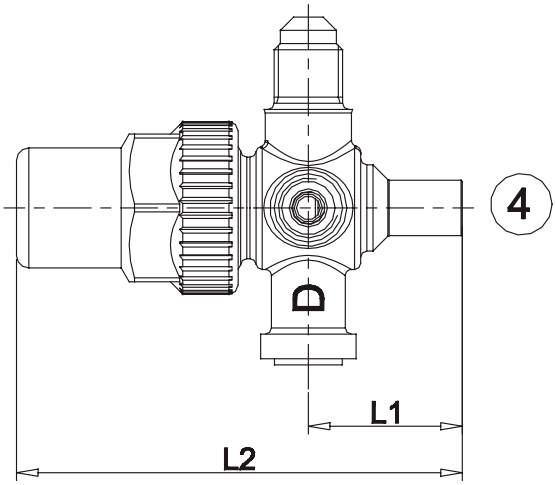

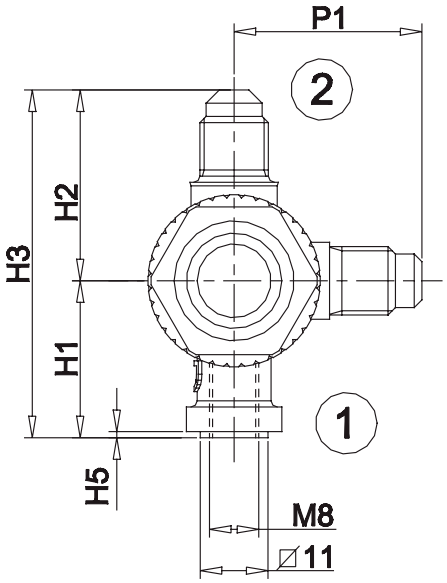

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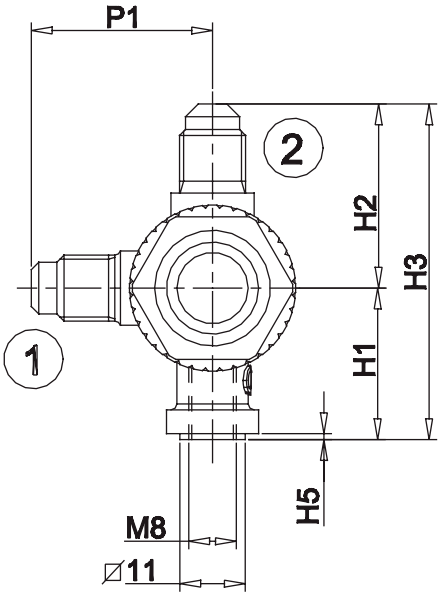
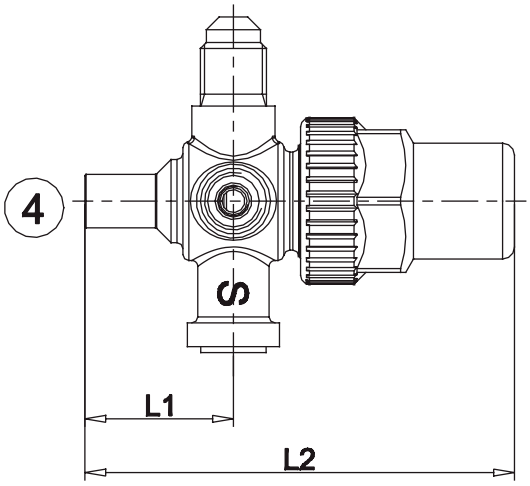




RECEIVER VALVES

APPLICATIONS

The receiver valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22 , R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

COSTRUCTION

These valves are available in the following two types:
- Two-ways valves, 90° angle connections, types 6110 and 6120
- Three-ways valves; two main connections (90° angle) plus a third one for charging, type 6132. The access connection may be shut off by the back-seating of the spindle
- Two-ways valves, 120° angle connections, type 6140

The main parts of the receiver valves are made with the following materials:
- Hot forged brass EN 12420 – CW 617N for body
- Steel, with proper surface protection, for the spindle
- Chloroprene rubber (CR) and aramidic fibers for gland seal
- Glass reinforced PBT for cap that covers the spindle

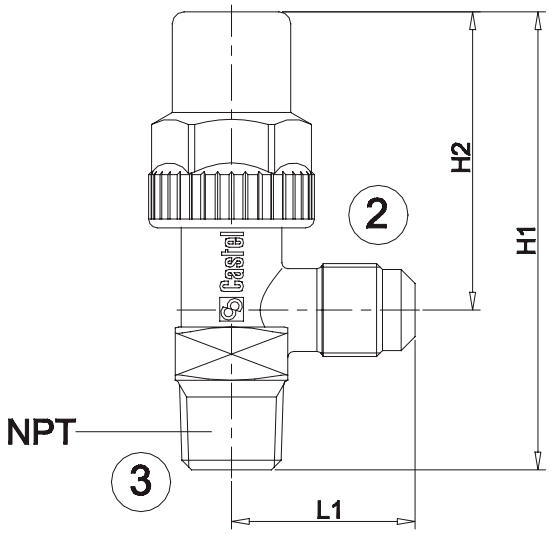
TABLE 1: General Characteristics

Catalogue Number	Connections			Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category
	SAE Flare		NPT					
	(1)	(2)	(3)		min.	max.		
6110/21	–	1/4"	1/8"	0,44	-60	+130	45	Art. 3.3
6110/22		1/4"	1/4"					
6110/X15	1/4" F	1/4"	–					
6110/X11	–	–	1/4" M/F					
6110/23		1/4"	3/8"	0,45				
6110/32		3/8"	1/4"	1,35				
6110/33		3/8"	3/8"					
6110/X13	3/8" F	3/8"	–					
6110/43		1/2"	3/8"	2,40				
6110/44		1/2"	1/2"	3,40				
6110/54		5/8"	1/2"					
6110/66		3/4"	3/4"	6,00				
6120/22		1/4"	1/4"	0,44				
6120/23	–	1/4"	3/8"	0,45				
6120/32		3/8"	1/4"	1,35				
6120/33		3/8"	3/8"	1,35				
6120/43		1/2"	3/8"	2,40				
6120/44		1/2"	1/2"	3,40				
6120/54		5/8"	1/2"					
6120/66		3/4"	3/4"	6,00				
6132/22	1/4"	1/4"	1/4"	0,45		+110		
6132/33		3/8"	3/8"	1,20				
6132/44		1/2"	1/2"	2,20				
6132/54		5/8"	1/2"	3,85				
6140/22	–	1/4"	1/4"	0,36		+130		
6140/23		1/4"	3/8"					

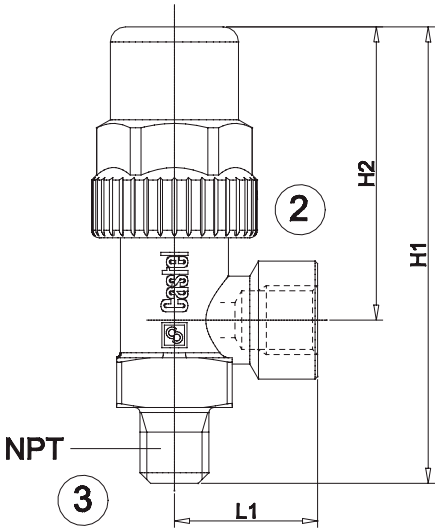
TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]				Weight [g]
	H_1	H_2	L_1	L_2	
6110/21	70,5	48	27,5	–	100
6110/22	72				110
6110/X15	83				130
6110/X11	88	56	28,5		230
6110/23	77	50	29		135
6110/32			31		130
6110/33					140
6110/X13	87				175
6110/43	88	56	34,5		220
6110/44	92				235
6110/54					245
6110/66	128	88	42,5		675
6120/22	28	–	72	48	110
6120/23	30		77	50	130
6120/32			80		135
6120/33			80		140
6120/43			93	56	225
6120/44	33				305
6120/54			94		245
6120/66	40		129,5	88	670
6132/22	56	29	94	64	240
6132/33			97		250
6132/44	66	36	112	75	350
6132/54			115		365
6140/22	57	–	69	46	115
6140/23					125

6110



6110/X11



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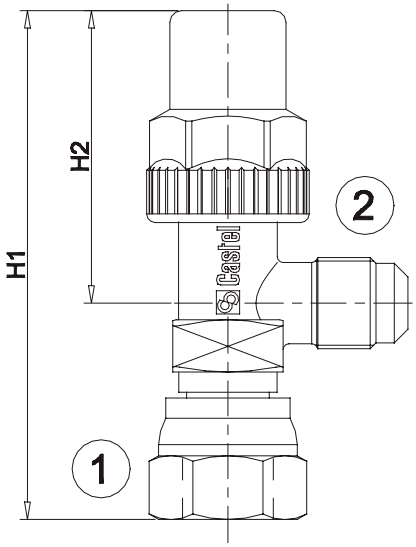
6110/X15



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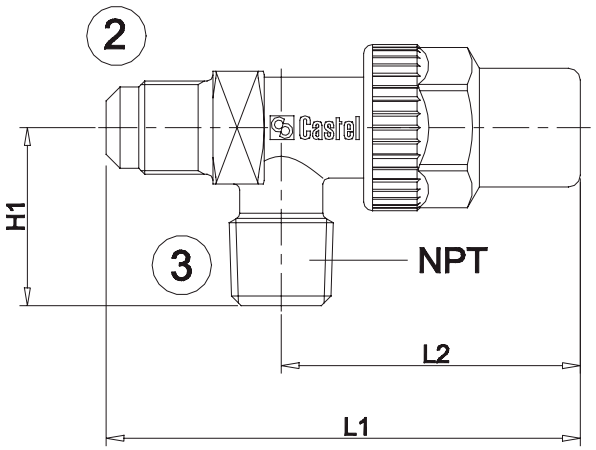
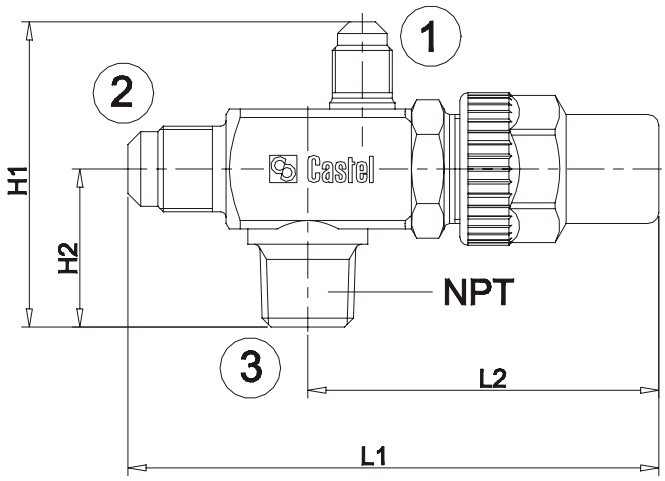
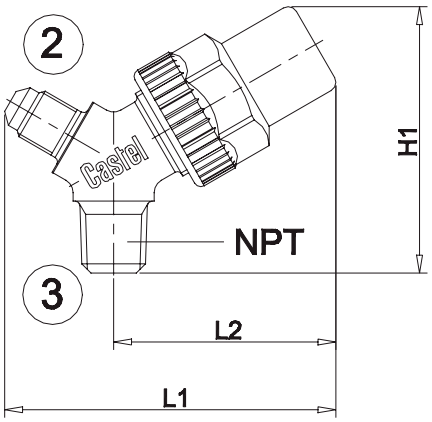


6132



6140



APPLICATIONS

The stop valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.
Stop valves series 6170 e 6175 are designed for installation on conditioning systems, which use fluids R22A and R407C 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).
Stop valves series 6176 are designed for installation on conditioning systems, which use fluid R410A always proper to the Group II.
For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

COSTRUCTION

The very compact design of these brass valves allows minimum dimensional sizes and the fixing flange complies with current market requirements.
Valves 6170 and 6175 must be completed with the following devices, to be ordered separately:

- Inside spring valve code 8394/B or outside spring valves code 8395/A1 , 8395/A3
- Cap with gasket code 8392/A or 1/4" SAE FLARE blind cap nut code 7020/20

Valves 6176 must be completed with the following devices, to be ordered separately:

- Outside spring valves code 8395/A1 , 8395/A3
- 5/16" SAE FLARE blind cap nut code 7020/X02

The main parts of the stop valves are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body
- Brass EN 12164 – CW 614N for spindle and protection cap
- Chloroprene rubber (CR) for outlet seal gaskets for series 6165 , 6175 and 6176
- Chloroprene rubber (CR) and aramidic fibers for gland seal, only for series 6170

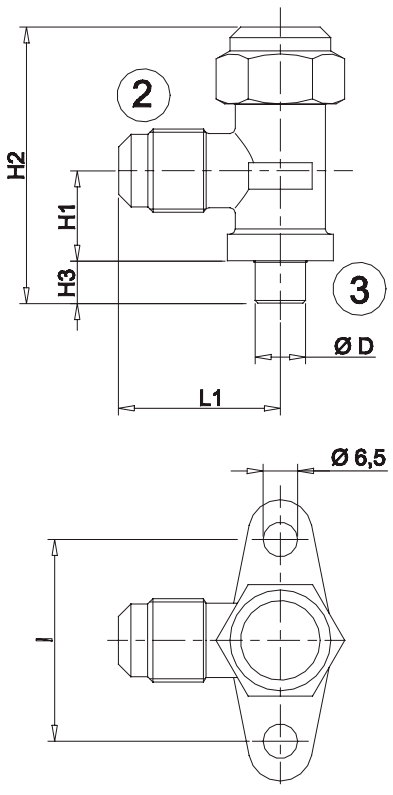
TABLE 1: General Characteristics

Catalogue Number	N° vie	Connections				Kv Factor [m^3/h]	TS [°C]		PS [bar]	Risk Category according to PED
		SAE Flare		ODS (3)						
		(1)	(2)	Ø [in.]	Ø [mm]		min.	max.		
6165/22	2	–	1/4"	1/4"	–	0,68	-20	+110	45	Art. 3.3
6165/33			3/8"	3/8"		1,70				
6175/33	3	1/4"	3/8"	3/8"		1,70				
6175/44			1/2"	1/2"		3,40				
6175/55			5/8"	5/8"	16	4,60				
6170/66			3/4"	3/4"	–	9,00				
6170/77			7/8"	7/8"		10,80				
6176/44	3	5/16”	1/2"	1/2"	–	3,40				
6176/55			5/8"	5/8"	16	4,60				
6176/66			3/4"	3/4"	–	7,50				

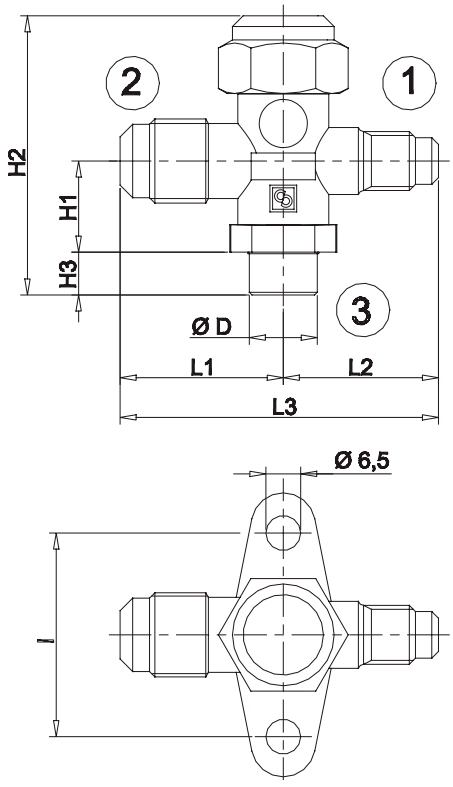
TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]								Weight [g]
	H_1	H_2	H_3	D	L_1	L_2	L_3	I	
6165/22	17	52	8	9,5	29	–	–	38	113
6165/33				12,7	30 ,5				120
6175/33						29	59,5		135
6175/44	20	65		15,9	36	31	67		225
6175/55				19,0					235
6170/66	28,5	104	12	22,2	47	36	83	50	655
6170/77				28,6					670
6176/44	20	65	8	15,9	36	31	67	38	225
6176/55				19,0					235
6176/66	24	70		22,2	41		72		280

6165



6170
6175
6176



APPLICATIONS

The diaphragm valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive. They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

COSTRUCTION

Diaphragm valves don't have gland seal. The external sealing is ensured by some thin metal discs (diaphragms), which hermetically divide the spindle chamber from the fluid flow area.

The main parts of the hermetic valves are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body
- Brass EN 12164 – CW 614N for spindle
- Harmonic steel for spring
- nylon for seat sealing gaskets

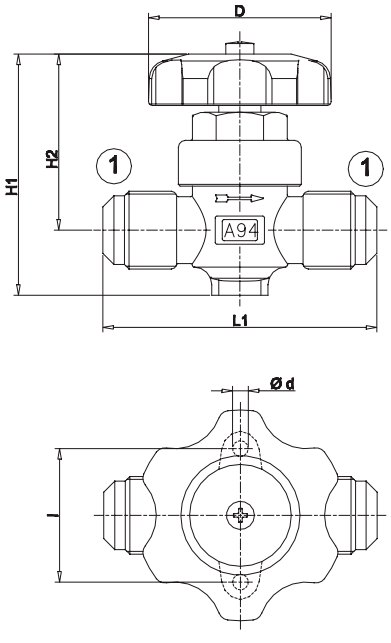
TABLE 1: General Characteristics

Catalogue Number	Connections			Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category according to PED
	SAE Flare (1)	ODS (2)			min.	max.		
		Ø [in.]	Ø [mm]					
6210/2	1/4"	–	–	0,28	-35	+90	28	Art. 3.3
6210/3	3/8"			1,00				
6210/4	1/2"			1,30				
6210/5	5/8"			1,80				
6210/6	3/4"			3,65				
6220/M6	–	–	6	0,28				
6220/2		1/4"	–					
6220/3		3/8"		1,00				
6220/M10		–	10					
6220/4		1/2"	–	1,30				
6220/5		5/8"	16	1,80				
6220/6		3/4"	–	3,65				
6220/7		7/8"						

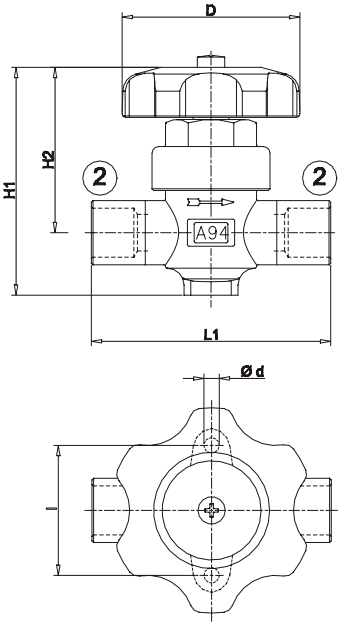
TABLE 2: Dimensions and Weights

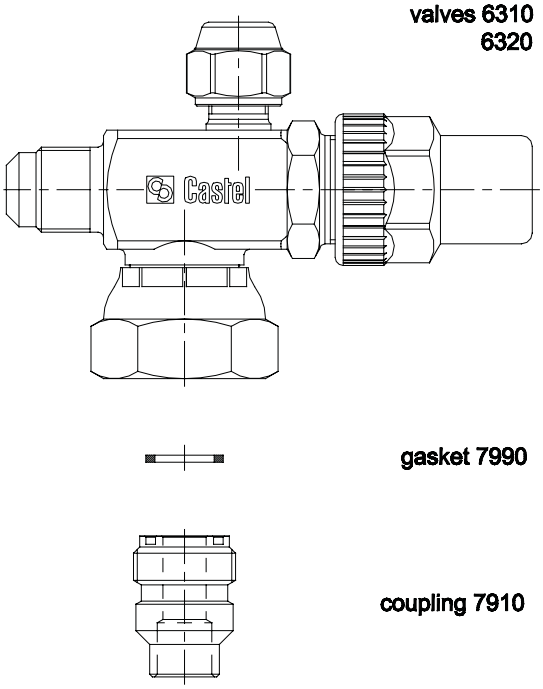
Catalogue Number	Dimensions [mm]						Weight [g]
	H_1	H_2	L_1	d	l	D	
6210/2	68	53,5	58	4,5	36	52	200
6210/3	72		74		38		325
6210/4			78				335
6210/5							340
6210/6	86	62,5	98	6,2	50	60	655
6220/M6	68	53,5	53	4,5	36	52	195
6220/2							
6220/3	72		61		38		300
6220/M10							
6220/4			70				305
6220/5			71				
6220/6	86	62,5	92	6,2	50	60	580
6220/7			94				645

6210



6220





APPLICATIONS

The rotalock valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive. They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410 ; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

COSTRUCTION

Rotalock valves, mounted with 7910 fittings and 7990 gaskets, assure fast installation and safe sealing.
Before tightening it is possible to turn the valve in every direction.
All Rotalock valves have an additional charging connection, which can be excluded by the back sealing of the spindle.
Fittings 7910 and gaskets 7990 have to be ordered separately

The main parts of the hermetic valves are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body
- Steel, with proper surface protection, for the spindle
- Chloroprene rubber (CR) and aramidic fibers for gland seal
- Glass reinforced PBT for cap that covers the spindle
- Steel bar EN 10277-3 11 S Mn Pb 37 for 7910 fittings
- P.T.F.E. for 7990 gaskets

TABLE 1: General Characteristics

Catalogue Number	Connections			Union code	Gasket code	Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category secondo PED
	SAE Flare		Swivel nut				min.	max.		
	(1)	(2)	(3)							
6310/2	1/4"	1/4"	3/4" UNF	7910/6	7990/6	0,46	-60	+110	45	Art. 3.3
6310/3		3/8"				1,35				
6310/4		1/2"								
6320/3		3/8"	1" UNS	7910/8	7990/8	1,40				
6320/4		1/2"				3,10				
6320/5		5/8"				3,4				
6320/6		3/4"								

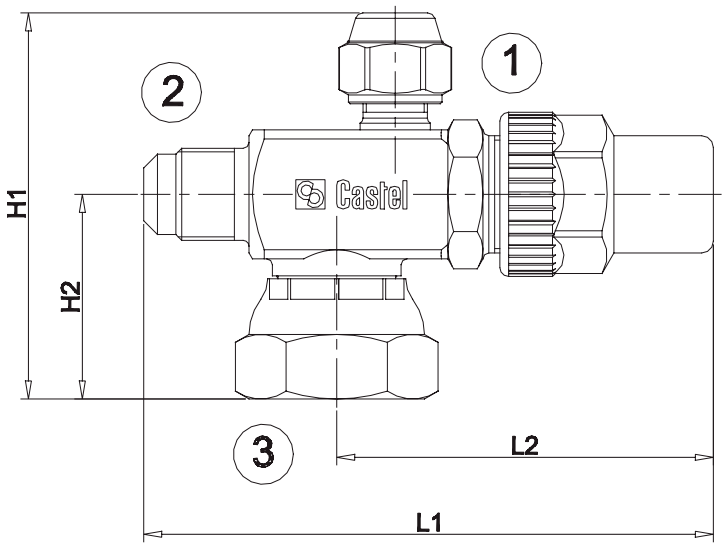
TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]				Weight [g]
	H_1	H_2	L_1	L_2	
6310/2	69	34	94	64	290
6310/3			97		300
6310/4					
6320/3	70	35			330
6320/4	72	37	115	78	400
6320/5			117,5		415
6320/6					425

TABLE 3: Unions Dimensions and Weight

Catalogue Number	Connections			L	Weight [g]	Gasket code
	Threaded	Solder [mm]				
		ODF	ODM			
7910/6	3/4" UNF	10	13	26	28	7990/6
7910/8	1" UNS	–	19		47	7990/8

6310
6320



APPLICATIONS

The capped valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

COSTRUCTION

The main parts of the capped valves are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body
- Steel, with proper surface protection, for the spindle
- Chloroprene rubber (CR) and aramidic fibers for gland seal
- Glass reinforced PBT for cap that covers the spindle

INSTALLATION

The brazing of capped valves with solder connections, type 6420, should be carried out with care, using a low melting point filler material. It's necessary to remove the spindle assembly, with gland too, before brazing the body. It's important to avoid direct contact between the torch flame and the valve body, which could be damaged and compromise the proper functioning of the valve.

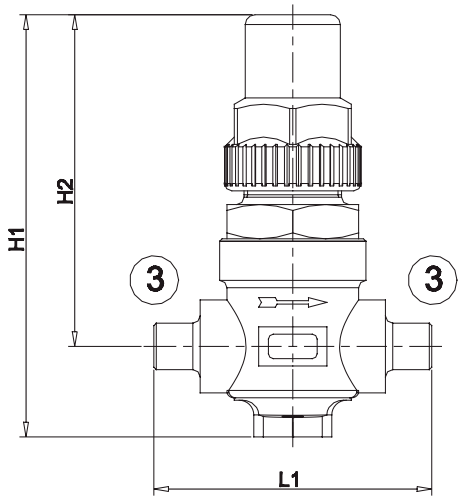
TABLE 1: General Characteristics

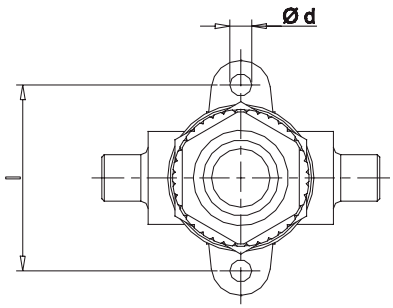
Catalogue Number	Connections				Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category according to PED
	SAE Flare		ODS (3)			min.	max.		
	(1)	(2)	Ø [in.]	Ø [mm]					
6410/2	1/4"	–	–	–	0,40	-60	+110	45	Art. 3.3
6410/3	3/8"				1,00				
6410/4	1/2"				1,45				
6410/5	5/8"				1,70				
6410/6	3/4"				3,50				
6420/2	–		1/4"		0,40				
6420/3			3/8"		1,00				
6420/3S3	3/8" - OUT		3/8"- IN						
6420/M10	–		–	10					
6420/M12				12	1,45				
6420/4			1/2"	–					
6420/5			5/8"	16	1,70				
6420/M18			–	18	3,50				
6420/6			3/4"	–					
6420/M22			–	22					
6420/7			7/8"	–					

TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]								Weight [g]
	H_1	H_2	L_1	L_2	L_3	P_1	d	l	
6410/2	85,5	67	68	–	–	–	4,5	38	305
6410/3			74						325
6410/4			78						330
6410/5									
6410/6	113	89,5	98				6,2	50	695
6420/2	85,5	67	57				4,5	38	300
6420/3			61						305
6420/3S3			67,5						
6420/M10			61						
6420/M12			70						
6420/4									
6420/5			71						
6420/M18			92						700
6420/6	113	89,5					6,2	50	685
6420/M22			94						690
6420/7									

6420





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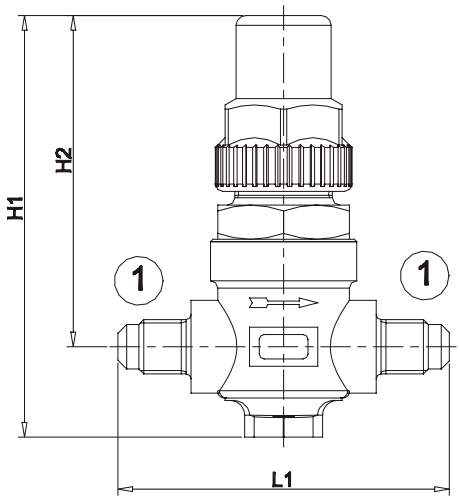
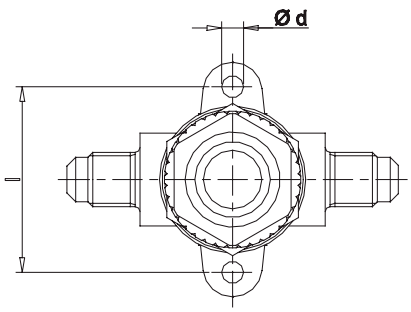




GLOBE VALVES

APPLICATIONS

The globe valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

COSTRUCTION

These valves are available in the following two types:
- 6512 with straight solder connections
- 6532 with solder angle connections.

The main parts of the globe valves are made with the following materials:
- Hot forged brass EN 12420 – CW 617N for body, cover and cap that covers the spindle
- Steel, with proper surface protection, for the spindle
- Chloroprene rubber (CR) and aramidic fibers for gland seal
- Metal-rubber laminated for outlet seal gaskets
- P.T.F.E. for seat gaskets

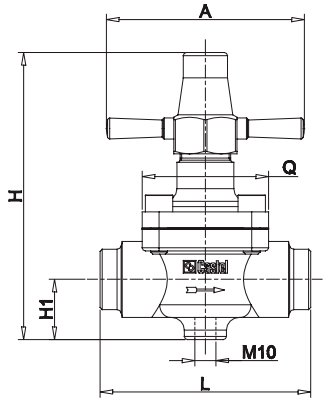
TABLE 1: General Characteristics

Catalogue Number	Connections				Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category according to PED
	ODS		ODM			min.	max.		
	Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]					
6512/M22	–	22	–	28	7,1	-35	+160	45	Art. 3.3
6512/7	7/8"	–	1.1/8"	–					
6512/M28	–	28	1.3/8"	35	8,4				
6512/9	1.1/8"	–	1.3/8"	35					
6512/11	1.3/8"	35	1.5/8"	–	15,0				
6512/13	1.5/8"	–	2"	–	25,0				1
6512/M42	–	42	2"	–					
6512/17	2.1/8"	54	–	–	40,0				
6532/M22	–	22	–	28	8,2				Art. 3.3
6532/7	7/8"	–	1.1/8"	–					
6532/M28	–	28	1.3/8"	35	9,1				
6532/9	1.1/8"	–	1.3/8"	35					
6532/11	1.3/8"	35	1.5/8"	–	18,7				
6532/13	1.5/8"	–	2"	–	38,0				1
6532/M42	–	42	2"	–					
6532/17	2.1/8"	54	–	–	48,5				

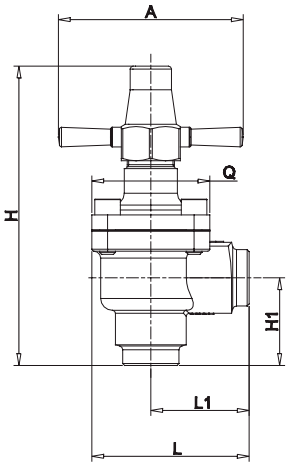
TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]						Weight [g]
	H	H_1	L	L_1	Q	A	
6512/M22	136	28,5	100	–	60	94	1415
6512/7							
6512/M28							1310
6512/9							
6512/11	166	34	118		68	126	2020
6512/13	199	37	141		88	138	3500
6512/M42							
6512/17	215	42,5	173		104		5050
6532/M22	147	44,5	80	50	60	94	1350
6532/7							
6532/M28							1290
6532/9							
6532/11	165	52,5	93	59	68	126	1910
6532/13	238	65	139	86,5	104	138	4920
6532/M42							
6532/17							4765

6512



6532



BALL VALVES

Approved by Underwriters Laboratories Inc.

APPLICATIONS

The ball valves, shown in this chapter, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive. They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.

Ball valves series 6570 , 6571 and 6590 are approved by Underwriters Laboratories Inc. of the United States according to UL 207 Standard.

COSTRUCTION

The specific design of Castel ball valves:

- ensures the internal equilibrium of pressures when the valve is closed,
- permits the bi-directional flow of the refrigerant and, consequently, the assembly on the plant without taking into account the direction of the refrigerant.
- prevents any risk of ejection or explosion of the spindle.

The opening and closing of the valve is realized by turning the spindle one fourth of a turn. A standstill in turning realizes either a full opening or a full closing, moreover the arrow printed on the spindle head shows the flow direction.

The electric welding of the bodies and the seal gaskets, assembled on the spindle, prevent any leaks.

Ball valves are available in the following two types:

- Type 6570 - 6590 (full port) and type 6571 - 6591 (reduced port) without access fitting.
- Type 6570/A - 6590/A (full port) and type 6571/A – 6591/A (reduced port) with access fitting. These ball valves are equipped with valve core 8395/A1 and cap 8392/A.

The main parts of the valves are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body
- Hot forged brass EN 12420 – CW 617N, chromium plated, for ball
- Copper tube EN 12735-1 – Cu-DHP for solder connections
- Steel, with proper surface protection, for the spindle.
- Chloroprene rubber (CR) for outlet seal gaskets
- P.T.F.E. for seat ball gaskets
- Hot forged brass EN 12420 – CW 617N for the caps covering the spindle.

INSTALLATION

The brazing of ball valves should be carried out with care, using a low melting point filler material. It is important to avoid direct contact between the torch flame and the valve body, which could be damaged and compromise the proper functioning of the valve.

TABLE 1: General Characteristics									
Catalogue Number		Connections		Ball Port Ø [mm]	Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category according to PED
		ODS							
without access fitting	with access fitting	Ø [in.]	Ø [mm]			min.	max.		
6570/M6	6570/M6A	–	6	10	0,8	-40	+150	45 (1)	Art. 3.3
6570/2	6570/2A	1/4"	–						
6570/3	6570/3A	3/8"	–		3				
6570/M10	6570/M10A	–	10						
6570/M12	6570/M12A	–	12		5				
6570/4	6570/4A	1/2"	–						
6570/M15	6570/M15A	–	15	15	17				
6570/5	6570/5A	5/8"	16						
6570/M18	6570/M18A	–	18						
6570/6	6570/6A	3/4"	–						
6570/7	6570/7A	7/8"	22	19	29				
6570/M28	6570/M28A	–	28	25	51				
6570/9	6570/9A	1.1/8"	–						
6571/5	–	5/8"	16	10	5				
6571/7		7/8"	22	15	17				
6571/M28		–	28	19	29				
6571/9		1.1/8"	–						
6571/11		1.3/8"	35	25	51				

(1) : MWP = 435 psi according to UL approval

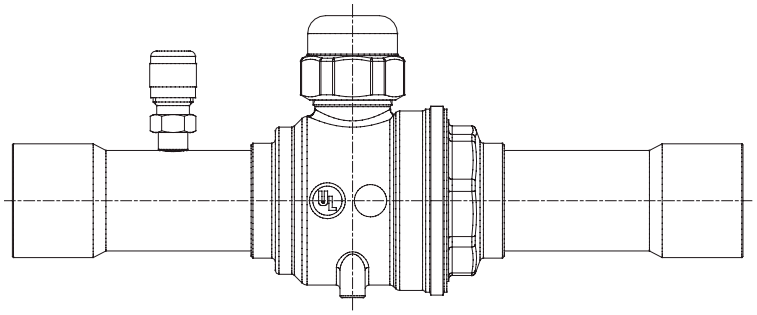


TABLE 2: General Characteristics									
Catalogue Number		Connections ODS		Ball Port Ø [mm]	Kv Factor [m³/h]	TS [°C]		PS [bar]	Risk Category according to PED
without access fitting	with access fitting	Ø [in.]	Ø [mm]			min.	max.		
6590/11	6590/11A	1.3/8"	35	32	86	-40	+150	45 (1)	Art. 3.3
6590/13	6590/13A	1.5/8"	–	38	117				I
6590/M42	6590/M42A	–	42						
6590/17	6590/17A	2.1/8"	54	50	214				
6590/M64	6590/M64A	–	64	65	433				
–	6590/21A	2.5/8"	–						
	6590/25A	3.1/8"	80	80	675			42	
6591/13	–	1.5/8"	–	32	86			45 (1)	Art. 3.3
6591/M42		–	42						
6591/17		2.1/8"	54	38	117				I
6591/M64	6591/M64A	–	64	50	214				
6591/21	6591/21A	2.5/8"	–						
–	6591/24A	3"	–	65	433			45	
	6591/25A	3.1/8"	–						
	6591/28A	3.1/2"	89	80	675			42	
	6591/29A	3.5/8"	–						
	6591/33A	4.1/8"	105		580				
	6591/34A	4.1/4"	108						

(1) : MWP = 435 psi according to UL approval

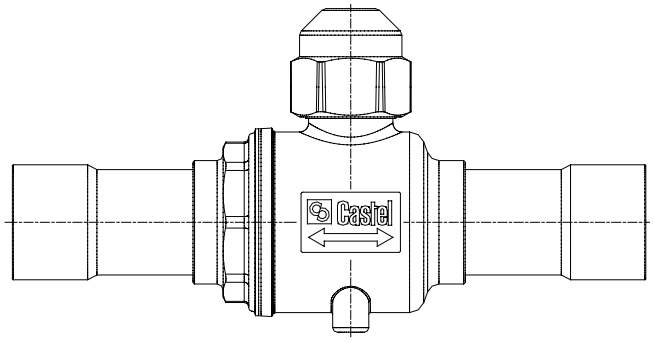
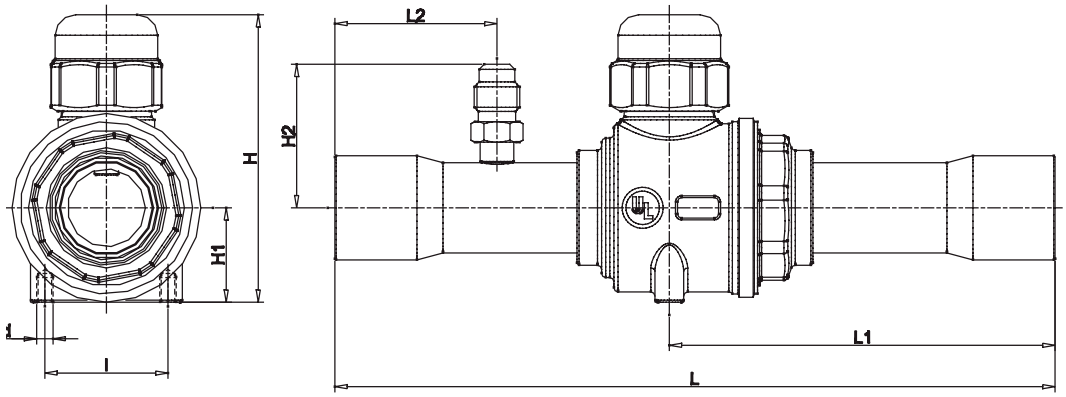


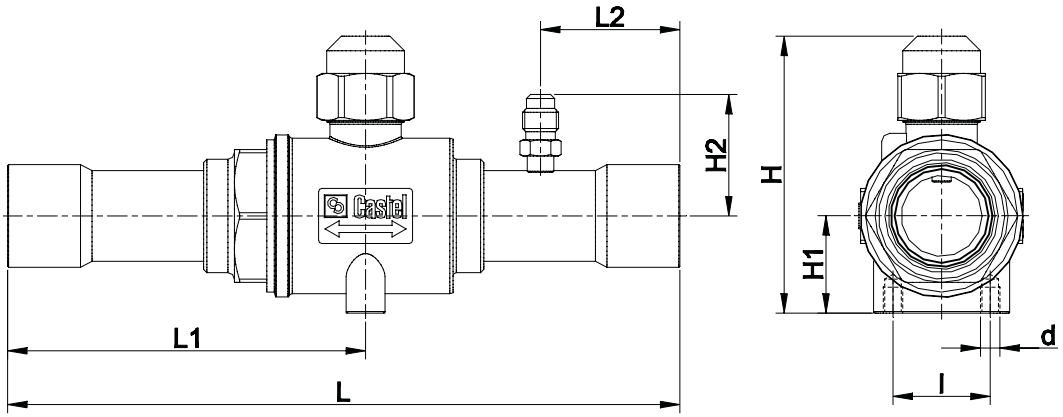
TABLE 3: Dimensions and Weights

Catalogue Number		Dimensions [mm]								Weight [g]
		H	H_1	H_2	L	L_1	L_2	l	d	
6570/M6	6570/M6A	48	15	29	121	65	25	18	M4	198
6570/2	6570/2A									201
6570/3	6570/3A									
6570/M10	6570/M10A									
6570/M12	6570/M12A									
6570/4	6570/4A									
6571/5	–			–	138	73,5	–			208
6570/M15	6570/M15A	55	19	32	139	73	30	25,5		311
6570/5	6570/5A									
6570/M18	6570/M18A									
6570/6	6570/6A									
6571/7	–			–	175	90,5	–			360
6570/7	6570/7A	70	23	34	175	94	40	30		570
6571/M28	–			–	206	109	–			601
6571/9										
6570/M28	6570/M28A	79	27	37	204	109	45	30		708
6570/9	6570/9A									
6571/11	–			–	245	130	–			840
6590/11	6590/11A	108	37	43	210	112	43	30	M6	1518
6591/13	–			–			–			
6591/M42										
6590/13	6590/13A	120	44	45	239	126	48			2470
6590/M42	6590/M42A									
6591/17	–			–	253	133	–			2520
6590/17	6590/17A	144	54	51	275	149	60			4360
6591/M64	6591/M64A									4400
6591/21	6591/21A									
6590/M64	6590/M64A	173	62	59	330	175	58	75	M10	8120
–	6590/21A									8090
	6591/24A				350	185	68			8310
	6591/25A									8350
	6590/25A	197	75	67	380	199	76			12400
	6591/28A									12450
	6591/29A									
	6591/33A				400	209	86			12500
	6591/34A									

6570
6571



6590
6591



GAUGE MOUNTING VALVES

APPLICATIONS

The valves, shown in this chapter, are classified “Pressure accessories” in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22 , R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.
They are used for mounting and intercepting the gauges on control panels.

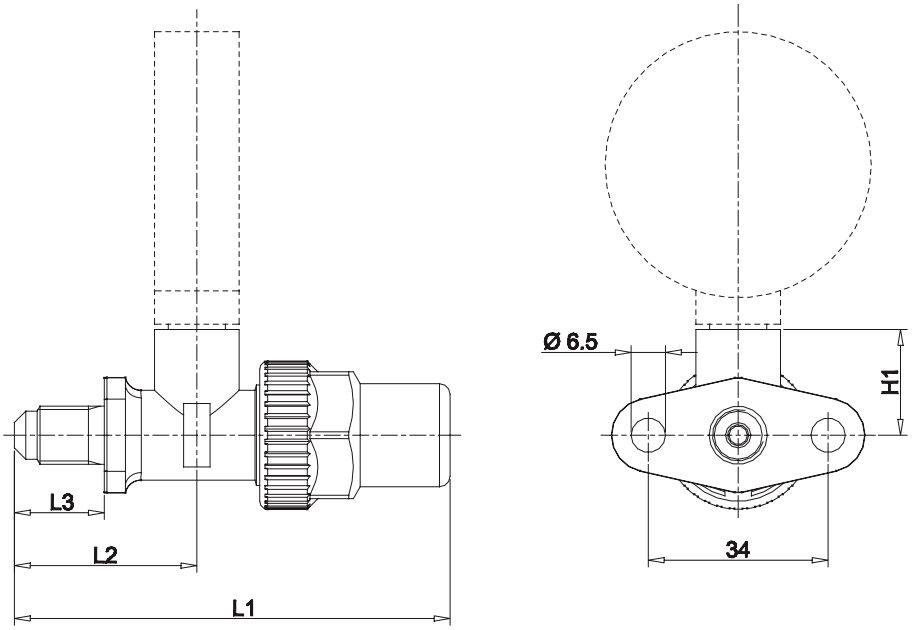
COSTRUCTION

The valves are equipped with:
- a little flange for fixing the valve to the control panel
- a SAE-Flare connection for joining it to the copper tube
- an NPT (type 8320) or a swivel SAE Flare (8321) connection for mounting the gauge

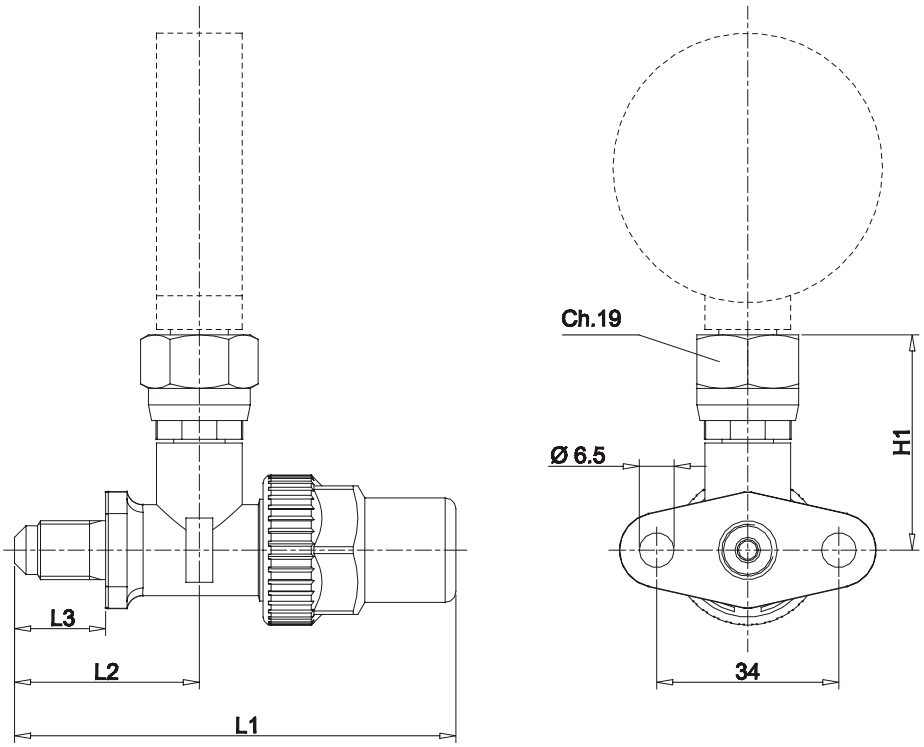
The main parts of this valve are made with the following materials:
- Hot forged brass EN 12420 – CW 617N for body
- Steel, with proper surface protection, for the spindle
- Chloroprene rubber (CR) and aramidic fibers for gland seal
- Glass reinforced PBT for cap that covers the spindle

TABLE 1: General Characteristics and Dimensions												
Catalogue Number	Connections			Dimensions [mm]				Weight [g]	TS [°C]		PS [bar]	Risk Category according to PED
	SAE Flare	NPT	SAE Flare	H	L_1	L_2	L_3		min.	max.		
8320/21	1/4"	1/8"	–	19	83	35	17	140	-60	+130	45	Art. 3.3
8320/22	1/4"	1/4"	–	37				186				
8321/22	1/4"	–	1/4"f	40								

8320



8321



LINE PIERCING VALVE

APPLICATIONS

The valve, shown in this chapter, is classified “Pressure accessories” in the sense of the Pressure Equipment Directive 97/23/EC, Article 1, Section 2.1.4 and are subject of Article 3, Section 1.3 of the same Directive.
They are designed for installation on commercial refrigerating systems and on civil and industrial conditioning plants, which use the following refrigerant fluids: R22, R134a, R404A, R407C, R410A; R507 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). For specific applications with refrigerant fluids not listed above, always proper to the Group II, please contact Castel Technical Department.
The piercing valve is a fast and cheap means of providing a loading, outlet or inlet point in the refrigerating system. It can be applied on copper tube with a 6 mm to 10 mm diameter, and can be installed in any position on the system.

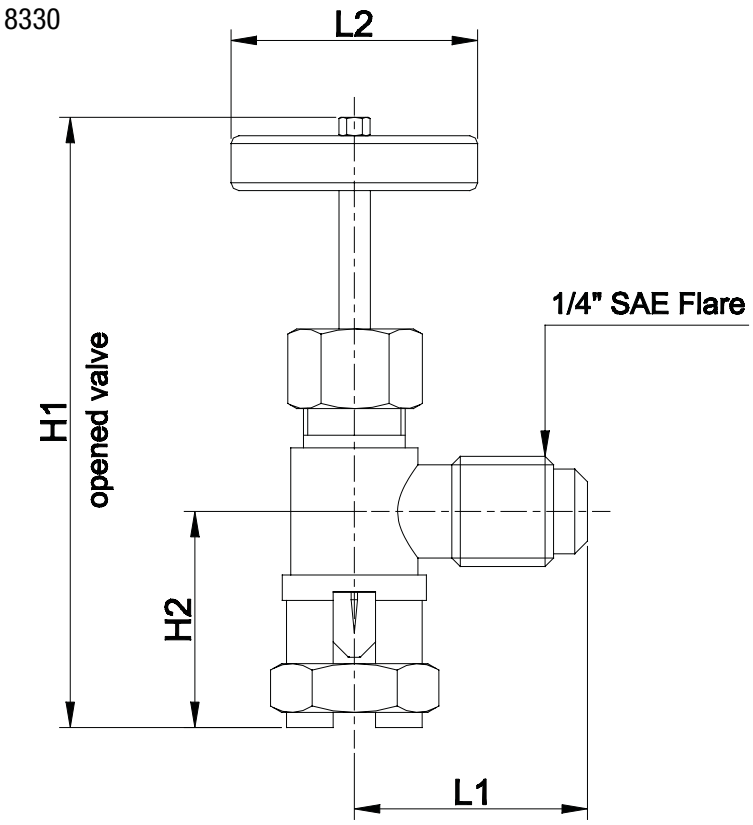
COSTRUCTION

The main parts of the piercing valve are made with the following materials:
- Hot forged brass EN 12420 – CW 617N for body
- Hardened steel for the needle
- Chloroprene rubber (CR) for the outlet seal gaskets

INSTALLATION

The threaded fork must be installed astride of the copper tube, the valve is fastened to the pipe by tightening the lower nut and screwing it the needle pierces the pipe. The hole, pierced by the needle, connects the pipe inlet with the SAE-Flare connection as shown in figures 1 and 2.

TABLE 1: General Characteristics and Dimensions											
Catalogue Number	Conections		Dimensions [mm]				Weight [g]	TS [°C]		PS [bar]	Risk Category according to PED
	SAE Flare	Pipe Diameter [mm]	H	L_1	L_2	L_3		min.	max.		
8330/A	1/4"	6 - 10	72	25,5	29	36	104	-10	+70	25	Art. 3.3



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