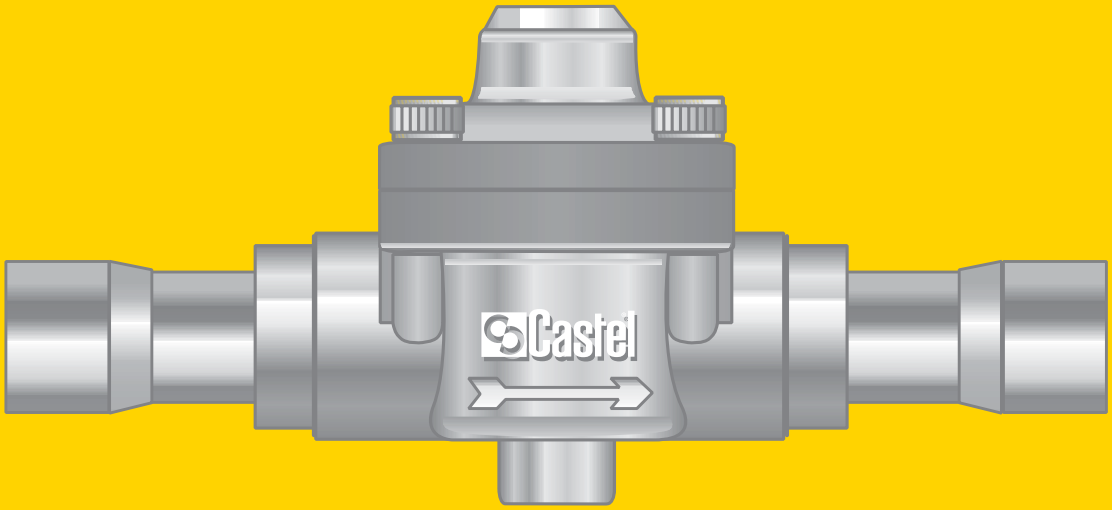
CHECK VALVES



Castel®

CHECK VALVES

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 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).
For heavy duty, about the operation temperature, for example installation on the discharge line close to the compressor, Castel has developed three new series of valves, types 3122, 3142 and 3182, equipped with special gasket for high temperature, between the body and its cover.

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 3.
Table 1 shows the following functional characteristics of a check valve:
- PS;
- TS;
- Kv factor;
- minimum opening pressure differential, that 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 3110, 3130 and 3131, preferably with vertical axis and arrow upward. Sloping axis, up to horizontal position, are tolerable.

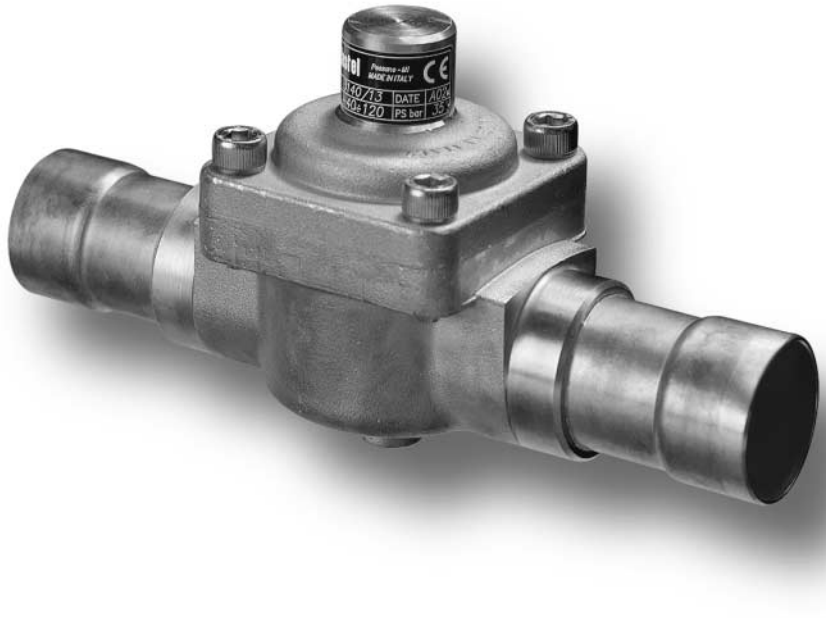
The brazing of valves with solder connections should be carried out with care, using a low melting point filler material. Before starting to braze, it’s necessary to disassemble the valves series 3122, while this operation is not necessary with solder connection valves. In any case, it’s important to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

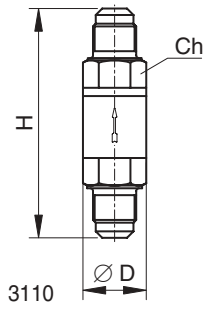
TABLE 1: General Characteristics

Catalogue Number	Connections					Kv Factor [m³/h]	Minimum Opening Pressure Differential [bar]	TS [°C]		PS [bar]	Risk Category according toPED
	SAE Flare	ODS		ODM				min.	max.		
		Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]						
3110/2	1/4"	–	–	–	–	0,4	0,1	– 40	+105	45	Art. 3.3
3110/3	3/8"					1,6					
3110/4	1/2"										
3110/5	5/8"					3,3					
3110/6	3/4"										
3122/M22	–	–	22	–	28	6,6		– 35	+160		
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"		25,0					I
3122/M42		–	42	2"							
3122/17		2.1/8"	54			40,0					
3130/2		1/4"	–			0,5		– 40	+105		Art. 3.3
3130/3		3/8"	–			1,6					
3130/M10		–	10								
3130/M12		–	12			1,8					
3130/4		1/2"	–								
3130/5		5/8"	16			3,3					
3130/M18		–	18								
3130/6		3/4"	–								
3130/7		7/8"	22								
3131/M10		–	10			1,6	0,3				
3131/M12		–	12			1,8					
3131/5		5/8"	16			3,3					
3131/7		7/8"	22								
3142/7		7/8"	22			6,6	0,1	– 35	+160		I
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			40,0					
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			19,0					
3182/13		1.5/8"	–			37,0					I
3182/M42		–	42								
3182/17		2.1/8"	54			45,4					

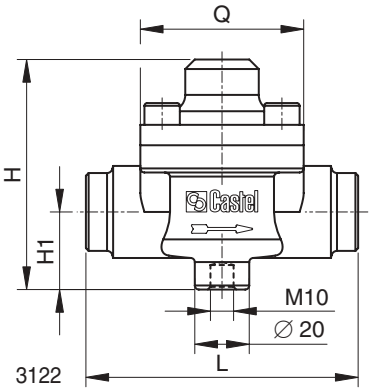
TABLE 2: Dimensions and Weights

Catalogue Number	Dimensions [mm]							Weight [g]
	H	H_1	L	L_1	Q	Ø D	Ch	
3110/2	84	–	–	–	–	23	20	150
3110/3	84,5							155
3110/4	83							165
3110/5	109					37	27	440
3110/6	108							460
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
3130/2	144	–	–		–	23	20	170
3130/3	148							185
3130/M10								
3130/M12								
3130/4								
3130/5	183					37	28	450
3130/M18								
3130/6								
3130/7	198							
3131/M10	148					23	20	185
3131/M12								
3131/5	183					37	28	450
3131/7	198							
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

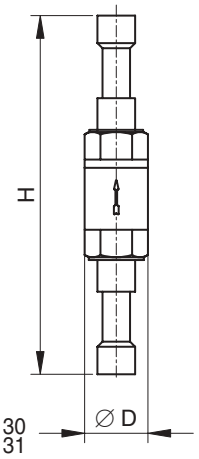




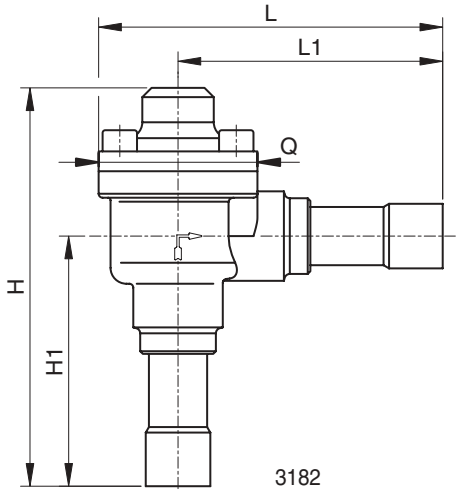
3110



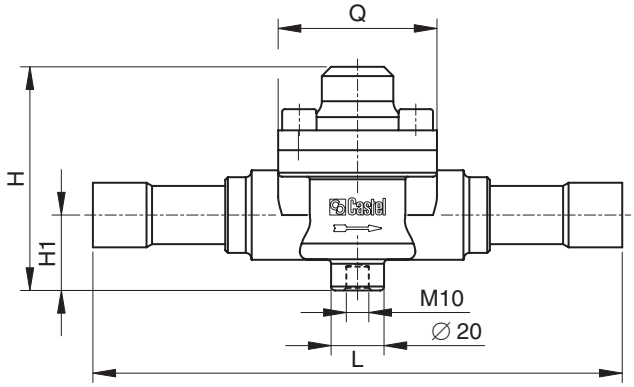
3122



3130
3131



3182



3142

TABLE 3: Refrigerant Flow Capacity

Catalogue Number	Refrigerant Flow Capacity [kW]														
	Liquid					Vapour					Hot Gas				
	R134a	R22	R407C	R404A	R410A	R134a	R22	R407C	R404A	R410A	R134a	R22	R407C	R404A	R410A
3110/2	6,7	7,2	7,5	4,8	7,6	0,9	1,1	1,1	0,9	1,4	3,4	4,7	4,6	4,0	5,2
3110/3	27,0	28,8	30,0	19,0	30,5	3,5	4,3	4,3	3,6	5,8	13,6	18,7	18,6	16,0	20,8
3110/4	30,3	32,4	33,7	21,4	34,3	3,9	4,9	4,8	4,1	6,5	15,3	21,1	20,9	18,0	23,4
3110/5	55,6	59,4	61,8	39,3	62,8	7,1	8,9	8,8	7,5	11,9	28,1	38,6	38,3	33,0	42,9
3110/6															
3122/M22	111,2	118,8	123,7	78,5	125,7	14,3	17,8	17,7	14,9	23,8	56,1	77,2	76,7	66,0	85,8
3122/7															
3122/M28	148,3	158,4	164,9	104,7	167,6	19,0	23,8	23,6	19,9	31,7	74,8	103,0	102,3	88,0	114,4
3122/9															
3122/11	256,1	273,6	284,8	180,9	289,4	32,8	41,0	40,7	34,4	54,7	129,2	177,8	176,6	152,0	197,6
3122/13	421,3	450,0	468,5	297,5	476,0	54,0	67,5	67,0	56,5	90,0	212,5	292,5	290,5	250,0	325,0
3122/M42															
3122/17	674,0	720,0	749,6	476,0	761,6	86,4	108,0	107,2	90,4	144,0	340,0	468,0	464,8	400,0	520,0
3130/2	8,4	9,0	9,4	6,0	9,5	1,1	1,4	1,3	1,1	1,8	4,3	5,9	5,8	5,0	6,5
3130/3	27,0	28,8	30,0	19,0	30,5	3,5	4,3	4,3	3,6	5,8	13,6	18,7	18,6	16,0	20,8
3130/M10															
3130/M12	30,3	32,4	33,7	21,4	34,3	3,9	4,9	4,8	4,1	6,5	15,3	21,1	20,9	18,0	23,4
3130/4															
3130/5	55,6	59,4	61,8	39,3	62,8	7,1	8,9	8,8	7,5	11,9	28,1	38,6	38,3	33,0	42,9
3130/M18															
3130/6															
3130/7															
3131/M10	27,0	28,8	30,0	19,0	30,5	3,5	4,3	4,3	3,6	5,8	13,6	18,7	18,6	16,0	20,8
3131/M12	30,3	32,4	33,7	21,4	34,3	3,9	4,9	4,8	4,1	6,5	15,3	21,1	20,9	18,0	23,4
3131/5	55,6	59,4	61,8	39,3	62,8	7,1	8,9	8,8	7,5	11,9	28,1	38,6	38,3	33,0	42,9
3131/7															
3142/7	111,2	118,8	123,7	78,5	125,7	14,3	17,8	17,7	14,9	23,8	56,1	77,2	76,7	66,0	85,8
3142/M28	148,3	158,4	164,9	104,7	167,6	19,0	23,8	23,6	19,9	31,7	74,8	103,0	102,3	88,0	114,4
3142/9															
3142/11	256,1	273,6	284,8	180,9	289,4	32,8	41,0	40,7	34,4	54,7	129,2	177,8	176,6	152,0	197,6
3142/13	421,3	450,0	468,5	297,5	476,0	54,0	67,5	67,0	56,5	90,0	212,5	292,5	290,5	250,0	325,0
3142/M42															
3142/17	674,0	720,0	749,6	476,0	761,6	86,4	108,0	107,2	90,4	144,0	340,0	468,0	464,8	400,0	520,0
3142/21															
3142/25															
3182/7	143,2	153,0	159,3	101,2	161,8	18,4	23,0	22,8	19,2	30,6	72,3	99,5	98,8	85,0	110,5
3182/M28	160,1	171,0	178,0	113,1	180,9	20,5	25,7	25,5	21,5	34,2	80,8	111,2	110,4	95,0	123,5
3182/9															
3182/11	320,2	342,0	356,1	226,1	361,8	41,0	51,3	50,9	42,9	68,4	161,5	222,3	220,8	190,0	247,0
3182/13	623,5	666,0	693,4	440,3	704,5	79,9	99,9	99,2	83,6	133,2	314,5	432,9	429,9	370,0	481,0
3182/M42															
3182/17	765,0	817,2	850,8	540,3	864,4	98,1	122,6	121,7	102,6	163,4	385,9	531,2	527,5	454,0	590,2

Refrigerant flow capacity referred to the following operating conditions:
- *Evaporating temperature: + 4 °C*
- *Condensing temperature: + 38 °C*
- *Pressure drop: 0,15 bar*

Particularly for hot gas:
- *Suction temperature: + 18 °C*
- *Pressure drop: 1 bar*