

HANDBOOK
VALVES

Ed. 2017

 **Castel**[®]
Italian technology

CHAPTER 3

VALVES WITH SCREW SHUTTER

FOR REFRIGERATION PLANTS THAT USE THE R744 REFRIGERANT

APPLICATIONS

The valves illustrated in this chapter have been developed by Castel for all the applications that use the sub-critical or transcritical R744 refrigeration fluid belonging to Group 2, defined in Article 13, Chapter 1, Point (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.

CAUTION!: Valves with screw shutter illustrated in this chapter cannot be used with other refrigerant fluids.

HERMETIC VALVES

Hermetic valves for CO₂ are two-way shut-off taps, type 6010E/2 and 6012E/22

The main parts are manufactured with the following materials:

- Hot forged brass EN 12420 – CW 617N for the body
- Steel, with proper surface protection, or brass for the spindle
- EPDM (ethylene propylene rubber) and aramid fibres for packing gland seal.
- Glass-reinforced PBT for the protective cap that covers the spindle.

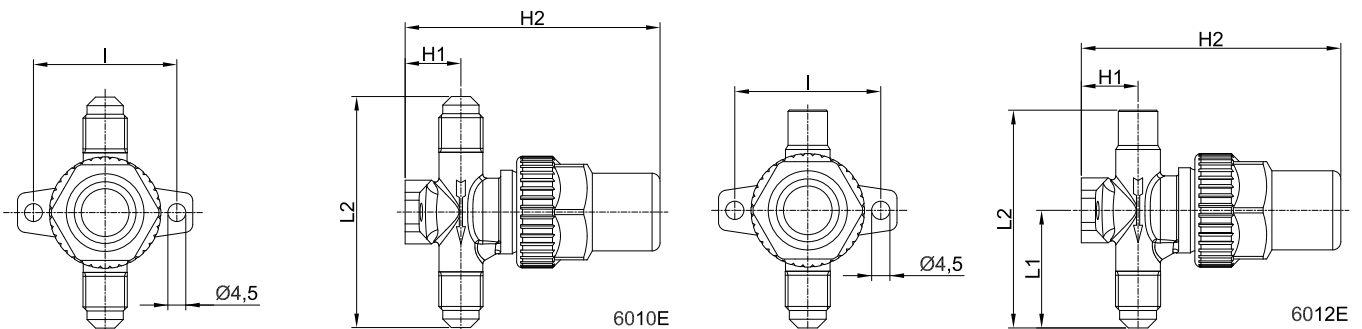


TABLE 21: General characteristics of valves for hermetic systems for R744

Catalogue Number	Connections			Kv Factor [m ³ /h]	PS [bar]	TS [°C]		TA [°C]		Risk Category according to PED Recast
	SAE Flare		ODS Ø [in.]			min.	max.	min.	max.	
	6010E/2	1/4"								
6012E/22	1/4"	–	1/4"							

TABLE 22: Dimensions and weights of valves for hermetic systems for R744

Catalogue Number	Dimensions [mm]					Weight [g]
	H ₁	H ₂	l	L ₁	L ₂	
6010E/2	14	66	36	–	58	160
6012E/22				29	55,5	145



RECEIVER VALVES

Receiver valves for CO₂ are two-way valves with 90° connections, types 6110E and 6120E.

The main parts are manufactured with the following materials:

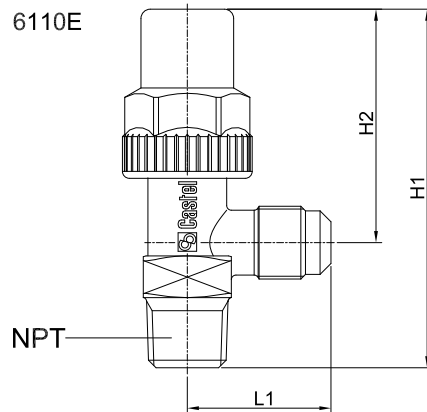
- Hot forged brass EN 12420 – CW 617N for the body
- Steel, with proper surface protection, for the spindle.
- EPDM (ethylene propylene rubber) and aramid fibres for packing gland seal.
- Glass-reinforced PBT for the protective cap that covers the spindle.

TABLE 23: General characteristics of receiver valves for R744

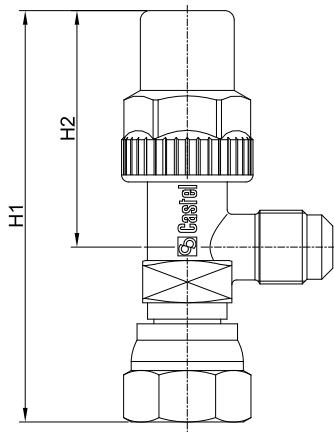
Catalogue Number	Connections		Kv Factor [m ³ /h]	PS [bar]	TS [°C]		TA [°C]		Risk Category according to PED Recast
	SAE Flare	NPT			min.	max.	min.	max.	
6110E/22	-	1/4"	1/4"	120	-40	+130	-40	+50	Art. 4.3
6110E/X15	1/4" F	1/4"	-						
6110E/33	-	3/8"	3/8"						
6110E/X13	3/8" F	3/8"	-						
6110E/44	-	1/2"	1/2"						
6120E/22	-	1/4"	1/4"						
6120E/33	-	3/8"	3/8"						
6120E/44	-	1/2"	1/2"						

TABLE 24: Dimensions and weights of receiver valves for R744

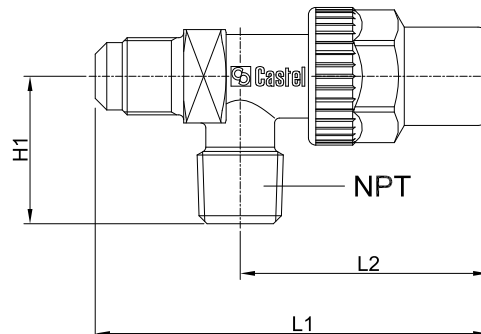
Catalogue Number	Dimensions [mm]				Weight [g]
	H ₁	H ₂	L ₁	L ₂	
6110E/22	72	48	27,5	-	110
6110E/X15	83				
6110E/33	77	50	31		140
6110E/X13	87				
6110E/44	92	55,5	34,5		235
6120E/22	27,5	-	72	48	110
6120E/33	30		80	50	140
6120E/44	33		93	55,5	305



6110E/X13
6110E/X15



6120E



CAPPED VALVES

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

- Hot forged brass EN 12420 – CW 617N for the body
- Steel, with proper surface protection, for the spindle.
- EPDM (ethylene propylene rubber) and aramid fibres for packing gland seal.
- Glass-reinforced PBT for the protective cap that covers the spindle.

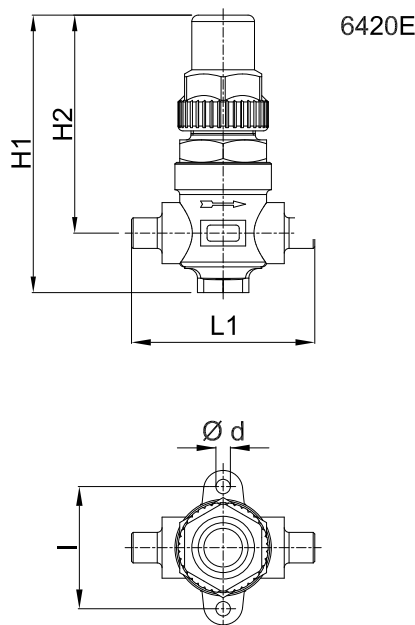
The brazing of capped valves, type 6420E, should be carried out with care, using a low melting point filler material. It is necessary to remove the spindle assembly, including the packing gland before brazing the body. It is important to avoid direct contact between the torch flame and the body, which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

TABLE 25: General characteristics of capped valves for R744

Catalogue Number	Connections		Kv Factor [m ³ /h]	PS [bar]	TS [°C]		TA [°C]		Risk Category according to PED Recast
	SAE Flare	ODS Ø [in.]			min.	max.	min.	max.	
6420E/2	-	1/4"	0,40	120	120	+110	-40	+110	Art. 4.3
6420E/3		3/8"	1,00						
6420E/3S3	3/8" - OUT	3/8" - IN							
6420E/4	-	1/2"	1,45						

TABLE 26: Dimensions and weights of capped valves for R744

Catalogue Number	Dimensions [mm]					Weight [g]
	H ₁	H ₂	L ₁	d	l	
6420E/2	85,5	67	57	4,5	38	300
6420E/3			61			305
6420E/3S3			67,5			
6420E/4			70			



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ed. 002-VR-ENG

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