

HANDBOOK

REFRIGERATING SYSTEM PROTECTORS

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 **Castel**[®]
Italian technology

CHAPTER 14 ■ INSPECTIONABLE STRAINERS

FOR REFRIGERATION PLANTS THAT USE THE R744 REFRIGERANT



APPLICATIONS

Castel has developed the inspectional strainers illustrated in this chapter for all applications that use 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.

The inspectionable mesh filters for plants that operate using refrigerant fluid R744 are the following:

- Filters in series 4727E with PS = 120 bar, equipped with reinforced copper connections (K65).
- Filters in series 4728E with PS = 140 bar, equipped with stainless steel connections.

CAUTION!: the filters in this chapter cannot be used with other refrigerant fluids.

CONSTRUCTION

The main parts of the inspectionable mesh filters are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for body and cover
- Austenitic stainless steel AISI 304 for the mesh filter
- Unsintered PTFE for the sealing gasket of the mesh filter
- Ethylene propylene rubber (EPDM) for outlet seal gaskets
- Copper pipe EN 12735-1 – CuFe2P (K65) for welded connections in series 4274E
- Stainless steel pipe AISI 304 for welded connections in series 4278E

INSTALLATION

The inspectional strainers can be installed on all branches of a refrigeration plant where it is necessary to avoid the

accumulation of dirt and sludge inside a highly delicate component (for example the backpressure valve). Table 57 shows the following operational characteristics of an inspectionable mesh filter:

- PS
- TS
- Kv factor

Copper connections: The brazing of filters with solder connections should be carried out with care, using a low melting point filler material (min.5 Ag). It is not necessary to disassemble the filters. However, avoid direct contact between the torch flame and the body, which could be damaged and compromise the proper functioning of the filter.

Steel connectors: TIG welding recommended, to be performed as quickly as possible according to the method shown in the product instruction sheet. The connection material is AISI 304: it is only possible to use AISI 308 filler material if welding to pipes made from the same type of material. For pipes made from other materials, please contact your welding supplies supplier.

The allowed operating positions are the following:

- With horizontal piping axis, removable cover facing downward.
- With vertical piping axis, arrow and removable cover facing downward.

NOTE: Filters 4727E and 4728E cannot be installed with the cover facing upward, in order to avoid that the dirt accumulated return into the plant when the filter is inspected/cleaned.

TABLE 58: General characteristics of inspectable strainer for R744

Catalogue Number	Filtering Surface [cm ²]	Useful Passage Surface [%]	Mesh Opening [mm]	Connections		Kv Factor [m ³ /h]	PS [bar]	TS [°C]		TA [°C]		Risk Category according to PED Recast
				ODS				min.	max.	min.	max.	
				Ø [in.]	Ø [mm]							
4727E/3	13	26	0,1	3/8"	–	2,0	120	– 40	+140	– 40	+50	Art. 4.3
4727E/4				1/2"	–	2,5						
4727E/5				5/8"	16	3,0						
4727E/6	18		0,2	3/4"	–	6,0						
4727E/7				7/8"	22	6,0						
4727E/9				1.1/8"	–	6,0						
4727E/11	31			1.3/8"	35	7,0						
4728E/M10	13	26	0,1	–	10	2,0	140	– 40	+140	– 40	+50	Art. 4.3
4728E/M12				–	12	2,5						
4728E/M16				–	16	3,0						
4728E/M18	18		0,2	–	18	6,0						
4728E/M22				–	22	6,0						
4728E/M28				–	28	6,0						
4728E/M35	31			–	33,4	7,0						

TABLE 59: Refrigerant flow capacity of inspectable strainer for R744[kW]

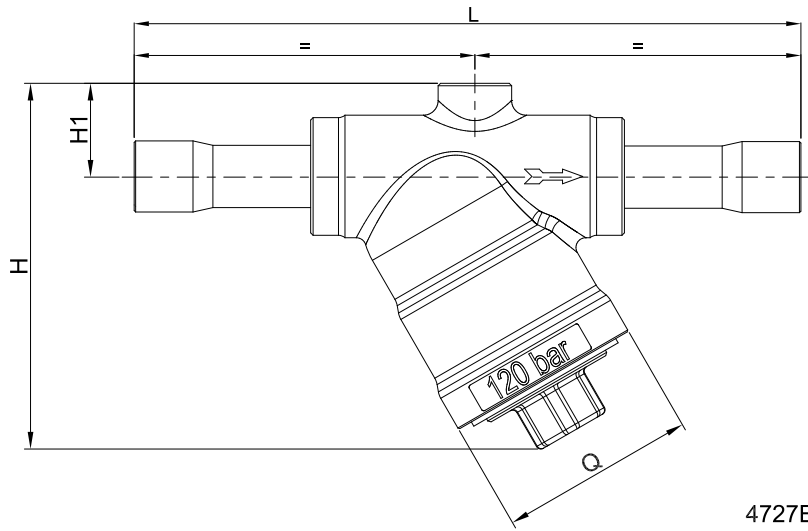
Catalogue Number	Transcritical system		
	Gas-cooling line	Suction line	Hot gas line
4727E/3	54,5	9,3	37,4
4727E/4	65,7	11,6	46,7
4727E/5	78,8	13,9	56,1
4727E/6	157,6	27,8	112,1
4727E/7	157,6	27,8	112,1
4727E/9	157,6	27,8	112,1
4727E/11	183,9	32,4	130,8
4728E/M10	52,5	9,3	37,4
4728E/M12	65,7	11,6	46,7
4728E/M16	78,8	13,9	56,1
4728E/M18	157,6	27,8	112,1
4728E/M22	157,6	27,8	112,1
4728E/M28	157,6	27,8	112,1
4728E/M35	183,9	32,4	130,8

Standard rating conditions according to AHRI Standard 760-2007 for transcritical system

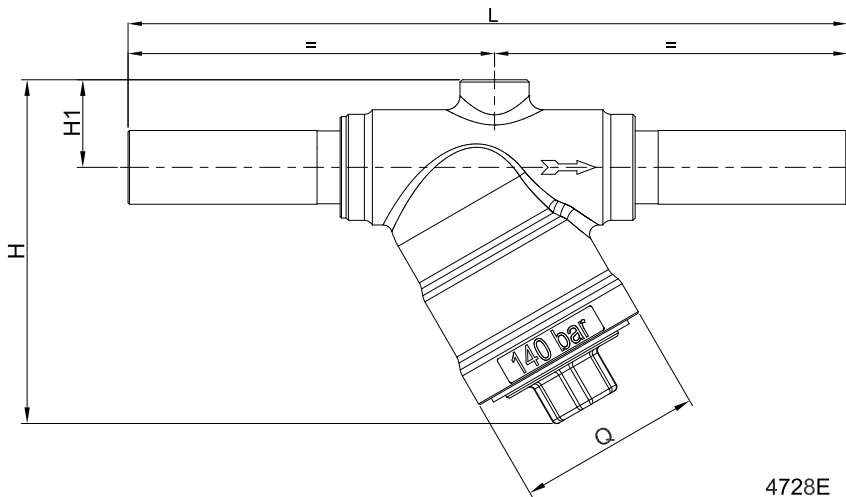
Gas-cooler outlet temperature	95 °F (35 °C)	Suction line temperature	32 °F (0 °C)
Evaporating temperature	14 °F (- 10 °C)	Suction line superheating	9 °R (5 °K)
Evaporator outlet temperature	23 °F (- 5 °C)	Discharge temperature	212 °F (110 °C)
Evaporator superheating	9 °R (5 °K)		

TABLE 60: Dimensions and weights of inspectable strainerst for R744

Catalogue Number	Dimensions [mm]				Weight [g]
	H	H ₁	L	Q	
4727E/3	74	19	140	40	505
4727E/4			136		505
4727E/5			148		520
4727E/6	96	24	164	50	1005
4727E/7			170		1024
4727E/9			201		1084
4727E/11	115	29	208	56	1480
4728E/M10	74	19	146	40	500
4728E/M12			142		500
4728E/M16			156		510
4728E/M18	96	24	164	50	1005
4728E/M22			170		1020
4728E/M28			201		1080
4728E/M35	115	29	208	56	1510



4727E



4728E

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