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HANDBOOK
PIPING ACCESSORIES

Ed. 2017



CHAPTER 1 ■ VIBRATION ABSORBERS

FOR REFRIGERATION PLANTS THAT USE HCFC, HFC, HC, HFO,
R744 REFRIGERANTS



APPLICATIONS

The vibration absorbers shown in this chapter are designed for installation on commercial refrigerating systems and on civil and industrial air conditioning plants. The function of this item is to avoid the transmission of compressor's vibrations to the refrigerating system pipes. They can also compensate small thermal expansion of the piping.

All vibration absorbers can be installed on systems that use the following refrigerant fluids:

- HCFC (R22)
- HFC (R134a, R404A, R407C, R410A, or R507)
- HFO and HFO/HFC mixtures (R1234ze, R448A, R449A, R450A, and R452A)

belonging to Group 2, as defined in Article 13, Chapter 1, Point (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.

Furthermore, vibration absorbers up to DN 25, that is model 7690/9, can also be installed on systems using the following refrigeration fluids:

- HFC (R32)
- HFO (R1234yf)
- HC (R290, R600, or R600a)

belonging to Group 1, as defined in Article 13, Chapter 1, Point (a) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.

For specific applications with refrigerant fluids not listed above, please contact Castel Technical Department.

CONSTRUCTION

The main union between various parts, including the copper/stainless steel connections are TIG welded (figure 1). This solution makes the vibration absorbers particularly resistant to the overheating during connection to the piping.

The main parts of vibration absorbers are manufactured with the following materials:

- Copper pipe EN 12735-1 – Cu-DHP for connections
- Stainless steel EN 10088-1 – 1.4305/1.4301 for fittings
- Stainless steel EN 10028-7 – 1.4541/1.4404 for corrugate flexible

- Stainless steel EN 10028-7 – 1.4301 for net holder
- Stainless steel EN 10088-3 – 1.4301/1.406 for wire “braid”

INSTALLATION

The vibration absorbers can be installed both on suction and discharge lines, as close as possible to the compressor. They are not designed to compensate possible piping misalignment.

Vibration absorbers should be installed perpendicularly to the direction of vibration. In the case of vertical and horizontal vibrations, two vibrations absorbers should be used perpendicular to each other, as shown in Fig. 2 and 3. For the maximum absorption of vibrations, the refrigerant line should be anchored at the vibration absorber end, as shown in Fig. 2 and 3.

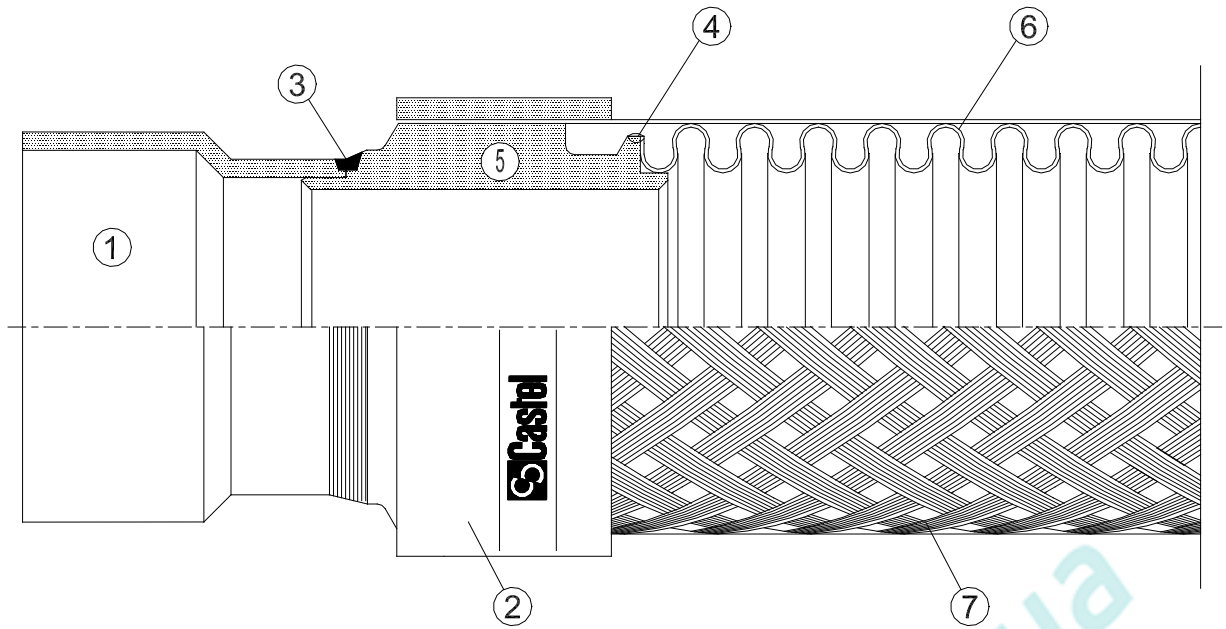
Castel vibration absorbers can be installed vertically too, because they are designed to avoid the retention of condensation in the wavy area near to the connections. There are no issues when employing them at temperatures below 0°C.

Vibration absorbers are not designed to absorb axial or torsional stress. Care should be taken to allow sufficient space to avoid compression or tension, after installation. High-speed refrigerant fluid can produce vibrations and noise phenomena. In this case, it is recommended that a larger size vibration absorber be installed

The connection of the vibration absorbers to the piping is normally performed by brazing. The specific design and construction of vibration absorbers allows the installer to perform this operation without special protection to prevent overheating, generated in this phase.

It is given that best installation calls for the vibration absorber to be linear. A misalignment from the axis of no more than 3% of the length of the corrugated hose is allowed.

WARNING! Ensure a gap corresponding to the 2% of the total length of the vibration absorber to compensate any extensions due to possible thermal expansion.



- 1 - Copper connection
- 2 - Net holder
- 3 - Copper ends welding
- 4 - Corrugated flexible welding
- 5 - Fitting
- 6 - Corrugated flexible
- 7 - Stainless steel wire braid

Fig. 1

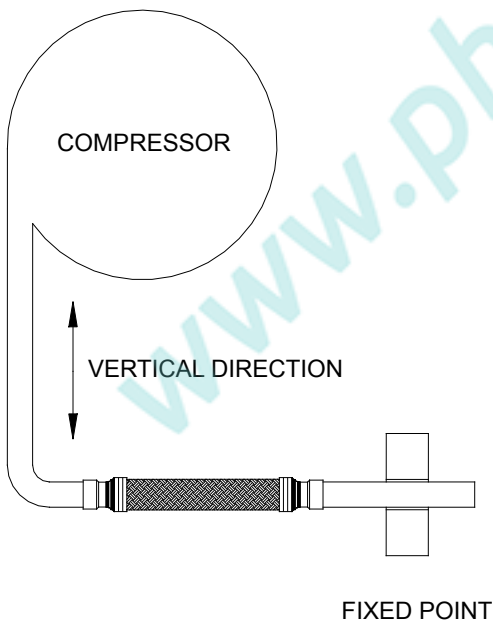


Fig. 2

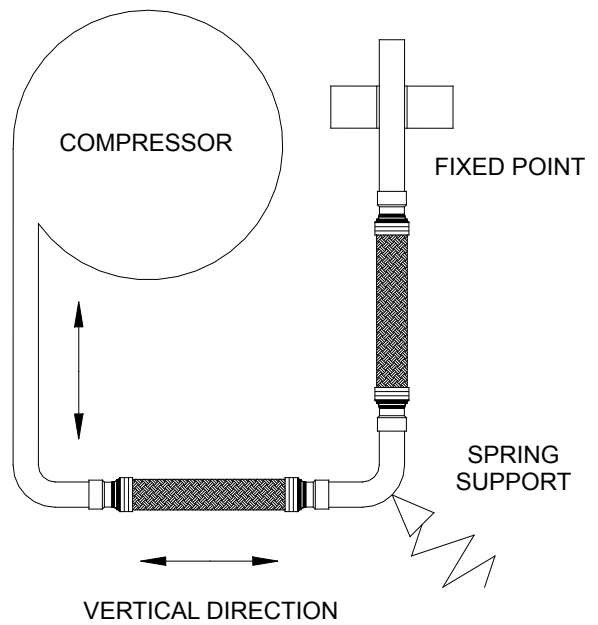
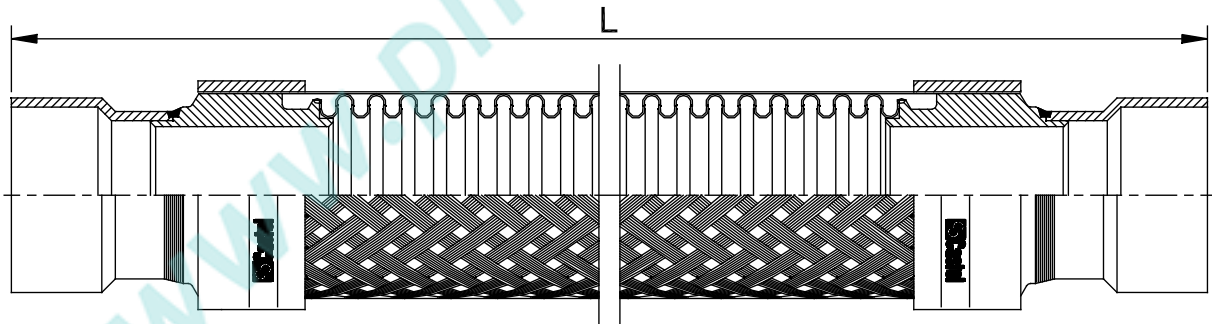


Fig. 3

TABLE 1: General characteristics of vibration absorbers

Catalogue Nr.	Connections		Length [mm]	Weight [g]	Working pressure (PS), depending on fluid temperature [bar]			TA [°C]		Risk Category according to PED Recast
	ODS				-80 / +100 °C	+ 120 °C	+140 °C	min	max	
	[mm]	[inch]								
7690/3	-	3/8	230	91	45	44	43,5	-40	+50	Art. 4.3
7690/M10	10	-		98						
7690/M12	12	-		122						
7690/4	-	1/2		120						
7690/M15	15	-	255	190						
7690/5	16	5/8		200						
7690/M18	18	-		180						
7690/6	-	3/4		180						
7690/7	22	7/8	290	317						
7690/M28	28	-	330	380						
7690/9	-	1.1/8		416						
7690/11	35	1.3/8	375	846						
7690/13	-	1.5/8	430	1088						
7690/M42	42	-		1200						
7690/17	54	2.1/8	510	2060	40	39	38,5			
7690/M64	64	-	690	3312	35	34,5	34			
7690/21	67	2.5/8		3500						
7690/24	76	3		3610						
7690/25	80	3.1/8		3660						
7690/28	89	3.1/2	710	4550	25	24,5	24			
7690/34	108	4.1/4		4770						



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