HEAT EXCHANGE INSTITUTE INCORPORATED
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Steam Inlet Expansion Joints

(LP TURBINE EXHAUST / STEAM SURFACE CONDENSER)

The placement of an expansion joint between the low pressure turbine exhaust and the condenser is often required to absorb the thermal movements of both the condenser and the turbine. The expansion joint minimizes loads being applied to the exhaust casing and keeps stresses within acceptable limits. Occasionally, turbine suppliers may permit other options such as solid attachment that eliminates the expansion joint but can result in a spring supported condenser. When an expansion joint is specified there are a number of criteria that must be provided to ensure adequate design.

Design Pressure Full Vacuum to 15 psig
Design Temperature Ambient to 212 deg F
Internal flow liner requirements
Size
Movements (axial and lateral)
Materials of Construction
Connection to turbine and condenser (welded , bolted)
Loads (allowable loads)

There are several popular type expansion joints that are used in this application. The most common are:

Rubber belt
Stainless steel bellows
Rubber "U"

The selection is most often driven by a strong customer preference, however, each expansion joint has characteristics that can influence the final selection. The following chart can assist with this evaluation.

	Rubber belt	Stainless steel	Rubber U
Axial spring rate	LOW	LOW	LOW
Lateral spring rate	LOW	HIGH	LOW
Expected material life	LIMITED	LONG	LIMITED
Installation type	BOLTED	WELDED	BOLTED
Temperature	LIMITED	HIGH	LIMITED
Air leakage possibilities	MEDIUM	LOW	MEDIUM
Ease of maintenance/ Replacement	MEDIUM	HIGH	MEDIUM

Please refer to the latest edition of the Heat Exchange Institute Standards for Steam Surface Condensers for more information.

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