

## Travel Required

The axial expansion or contraction of pipe or tube is determined by the change in temperature. Table 1 includes a tabulation of linear change in inches for 100 feet of commonly used materials based on an installation temperature of 70°F.

For installation temperature above 70°F

$$\text{Thermal expansion or contraction (inches)} = \text{Length of run between anchors (feet)} \times \frac{\text{Linear change from Table 1}}{100}$$

subtract the expansion for the installation temperature from the service temperature, and add for installations below 70°F.

The Intermediate Guide Spacing in Table 2 is the minimum recommended guide spacing required to ensure that the pipe or tube travel is translated to

and aligned with the compensators.

**Important:** Hyspan compensators are manufactured with restraints to insure the rated movements. For cold applications or other special conditions the factory must be notified in order to properly preset the units for extension applications.

## Anchor Forces

Systems incorporating expansion compensators must include structural reactions or main anchors as shown on the application diagrams (Page 3) with sufficient strength to withstand the full pressure thrust based on the effective area of the compensator, and the

spring force produced by deflecting the bellows element.

The highest pressure anticipated during service or testing should be used, and the maximum stroke for the most conservative design.

Ideally, intermediate anchors have balanced forces on each side; however, it is recommended that the maximum force produced by the compensator spring rate should be utilized for design.

$$\text{Main Anchor Force (lbs)} = \frac{\text{Pressure Force (lbs)}}{\text{(Table 3 Models 8503-6 or Table 4 Models 8509 \& 10)}} + \left\{ \begin{array}{l} \text{Spring Rate (lb/in)} \\ \text{(Column 2 Table 5 Models 8503-6 or} \\ \text{Column 3 Table 6 Model 8509 \& 10)} \end{array} \right\} \times \left\{ \begin{array}{l} \text{Axial} \\ \text{Travel} \\ \text{(inches)} \end{array} \right\}$$

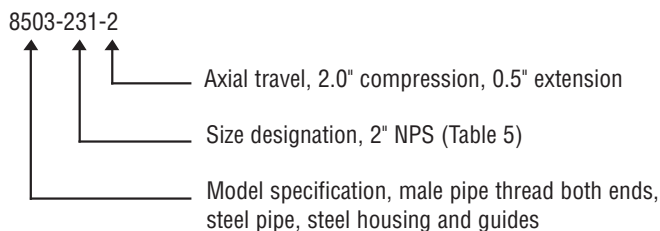
$$\text{Intermediate Anchor Force (lbs)} = \left\{ \begin{array}{l} \text{Spring Rate (lb/in)} \\ \text{(Column 2 Table 5 Models 8503-6 or} \\ \text{Column 3 Table 6 Model 8509 \& 10)} \end{array} \right\} \times \left\{ \begin{array}{l} \text{Axial} \\ \text{Travel} \\ \text{(inches)} \end{array} \right\}$$

## Ordering Instructions

Refer to Tables 5 & 6 on Page 5 for the steel pipe or copper tube end configuration required for your application. If the travel required is unknown, see the method of calculation above.

### Example

Threaded steel pipe ends  
200 psig at 500°F maximum  
2.0" axial travel maximum  
2" NPS



- Model 8503, 8504, 8505 and 8506 are available with all stainless steel construction for low temperature or highly corrosive service. Must be specified by written description.
- All Series 8500 compensators are available with multiple Alloy 625 bellows for highly corrosive media. Must be specified by written description.