

### 3.3 Installation of shaft coupling

#### 3.3.1 General

**ATTENTION !**

**Motors must always be accurately aligned, and this applies especially where they are directly coupled.**

**Incorrect alignment can lead to bearing failure, vibration and even shaft fracture. As soon as bearing failure or vibration is detected, the alignment should be checked.**

#### 3.3.2 Mounting procedure

Field application of a coupling to the motor shaft should follow the procedures recommended by the coupling manufacturer. The motor shaft extension must not be subjected to either extreme heat or cold during coupling installation.

#### 3.3.3 Safety attention

**ATTENTION !**

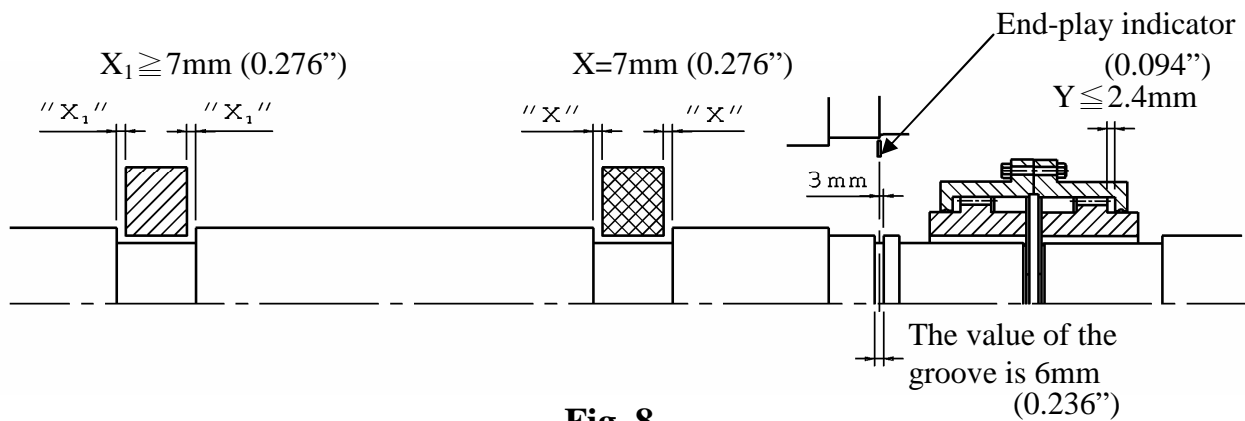
**Basically, the coupling should be heated and pushed onto the shaft extension with slight axial force. Do not hammer coupling to prevent bearing damage.**

#### 3.3.4 End-play

Although the sleeve bearings are equipped with thrust faces, these are intended only to provide momentary axial restraint of rotor movement either during start-up or when operating the motor disconnected from the driven equipment. They must not be operated under a constant thrust load unless they were originally designed for this condition.

Motors with either sleeve or anti-friction bearings are suitable for connection to the driven load through a flexible coupling. Coupling solidly to the load is not acceptable. With sleeve bearings, the flexible coupling should be of the limited end float type to prevent the possibility of any end thrust from the load being transmitted to the motor bearings, which could cause bearing damage.

The recommended limits of end float for couplings are as follows :



**Fig. 8**

- When the motor is in operation after installation, be sure that the end-play indicator is within the 6mm of the groove on the shaft or aligned to the shaft shoulder immediately outboard of the drive-end bearing to assure there is low friction between shaft and bearing.
- Unless otherwise specified, the designed end-play value  $X$  of the groove for TECO motors in general is within 7mm (0.276") as illustrated in Fig. 8. In essence, the end-play indicator is adjusted to point at the center of the groove or the drive-end shaft shoulder; thus  $X$  equals to  $7 \pm 1$ mm (0.276"  $\pm$  0.039") or so, and the end-play value ( $Y$ ) of the couplings should equal or be smaller than 2.4mm (0.094").
- If the desired value  $Y$  is greater than 3mm (0.118") caused for instance by a thrust load and/or load machine with large end-play, please inform us when ordering.

### 3.3.5 Thermal growth

In aligning the motor (and rotor) axially with the driven equipment, consideration should be given not only to the end-play indicator position but also to axial shaft expansion and increase in shaft centerline height due to thermal effects. In general, the axial shaft growth for motors can be disregarded since neither bearing is fixed and any shaft growth due to temperature increase will produce an elongation away from the coupling.

Shaft height growth (change in shaft centerline elevation) for TEFC machines can be calculated as follows :

$$\Delta = (0.0005) \times (\text{motor foot to shaft centerline dimension})$$

For non-TEFC machines, divide this number by 2.