
TRANS•TEKNOTE

Core Extension Rods

Introduction

Inductive sensors such as LVDTs and Linear Velocity Transducers (LVTs) are composed of two major parts: the coils and the core. For LVDTs, the movement of the core relative to the coils produces a change in the flux linkage between the primary and secondaries, resulting in a change in output voltage proportional to the displacement. In LVTs, the movement of the magnet through the coils results in a DC voltage output proportional to the velocity. In both cases, a connection is required between the core and the object being monitored - this is typically done using an extension rod.

Technical Recommendation

Extension rods should be made of nonferrous materials that are also poor electrical conductors. This is to avoid compromising transducer performance by changing the shape of the unit's magnetic fields or indirectly by enabling eddy currents, which work against the unit's magnetic fields. Preferred materials include nonmagnetic stainless steels and engineering plastics. Good conductors such as aluminum are not acceptable because the generation of eddy currents in the material will result in a non-linear output. Series 303 & 304 Stainless Steel are excellent choices for extension rod material.

Extension rods should be sized to allow the transducer to operate over its full range. Extension rods from models with longer strokes may be used to facilitate installation. Using extension rods shorter than recommended may reduce the LVDT's usable measurement range. The core should be positioned to allow free movement through the LVDT's entire measurement range. With proper alignment, the core will not contact the bore, resulting in frictionless operation. Contact between the core and the bore will not immediately affect transducer performance, however, significant frictional wear will result in a degradation in sensitivity and non-linearity.

Availability

Trans-Tek AC-AC LVDTs are supplied with a core tapped at both ends; most DC-DC LVDTs come with core and extension rod brazed together. Typically, in high volume applications, a custom connection is developed by the enduser. For low volume applications, however, Trans-Tek does have extension rods available.

Recommended extension rods for all standard AC LVDTs, as well as the Series 100 LVTs, are listed in their respective catalog spec sheets. Please refer to the corresponding catalog pages.