

LVDTs in Textile Machines

In the conventional textile industry, card sliver is generally drawn and/or spun into a yarn which is subsequently formed into a fabric by either knitting or weaving. To improve productivity and reduce production costs, the range of machines had to be reduced and perform in a different way to maintain quality. Lots of sensors and actuators are installed. Among them, displacement transducers (LVDT, short of Linear Variable Differential Transformer) play important roles to control the quality of sliver, yarn and fabric.

The typical uses of LVDTs are on-line monitoring

- the thickness of sheet cotton on scutching machine,
- the thickness of carding sliver on carding machine and drawn frame
- the density of fabric on knitting machine
- the quality aspects related to material feeding on sewing machine

In most cases, the sliver, yarn, fabric or textile fibre ribbon was passed between two rollers and a displacement of the pivoted tongue rolled measured by a linear transducer. This LVDT produces an analogue output signal proportional to the displacement. This signal is an input to a PLC that processes the signal to control a correction unit controlling the quality of the products being produced. They may change the feed speed of card feed roll or the gap of two rollers and etc. And on knitting or sewing machine, vertical displacement measurements by a LVDT can localize defects (fabric curls or folds) as well as a recurrent feeding efficiency (loss of contact between presserfoot and material, resulting in an irregular stitch at high speeds).



The preferred displacement transducers are linear variable differential transformers (LVDT's) which are not only capable of producing an output which is extremely linear with displacement, but also feature unlimited mechanical life due to its frictionless measurement. SensPro Electronics supplies both AC and DC type of LVDT to meet the requirement of application. The smallest measuring stroke can lower to $\pm 1.25\text{mm}$.