

# LVDT

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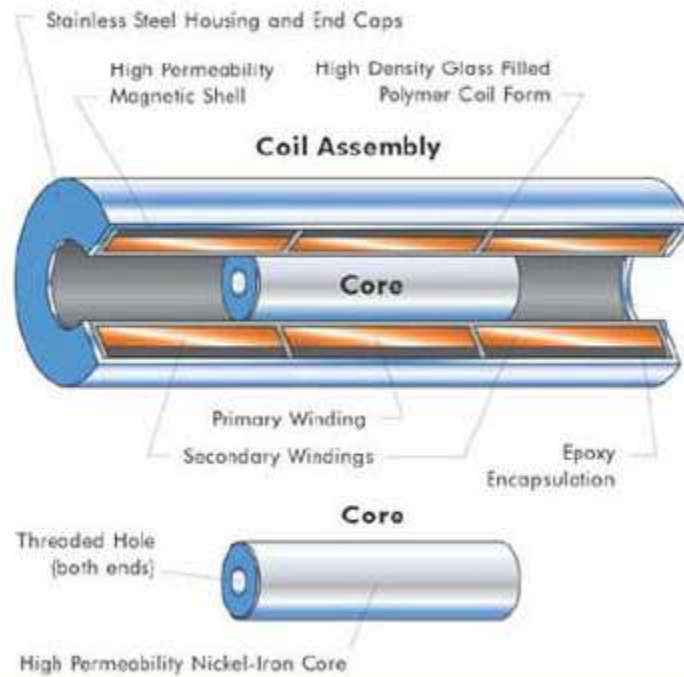
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# Definition

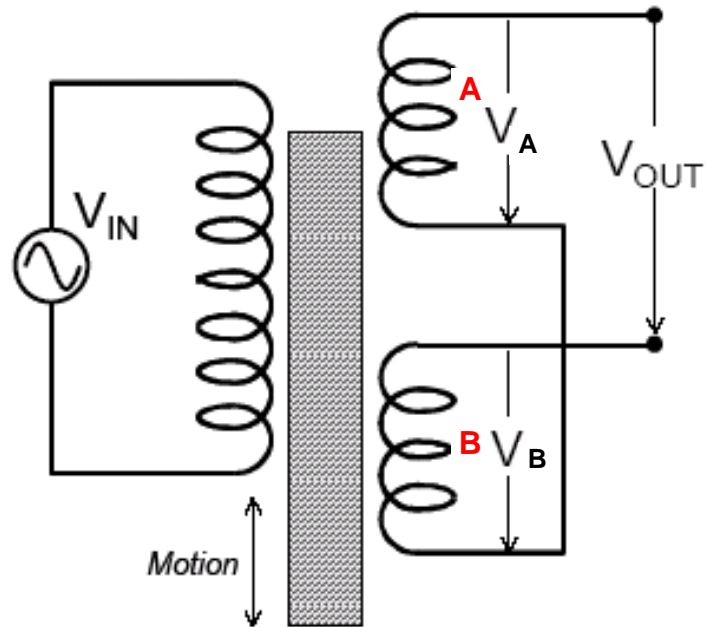
- The **linear variable differential transducer** (LVDT) is a type of electrical [transformer](#) used for measuring linear displacement. A reliable and accurate sensing device that converts linear position or motion to a proportional electrical output.

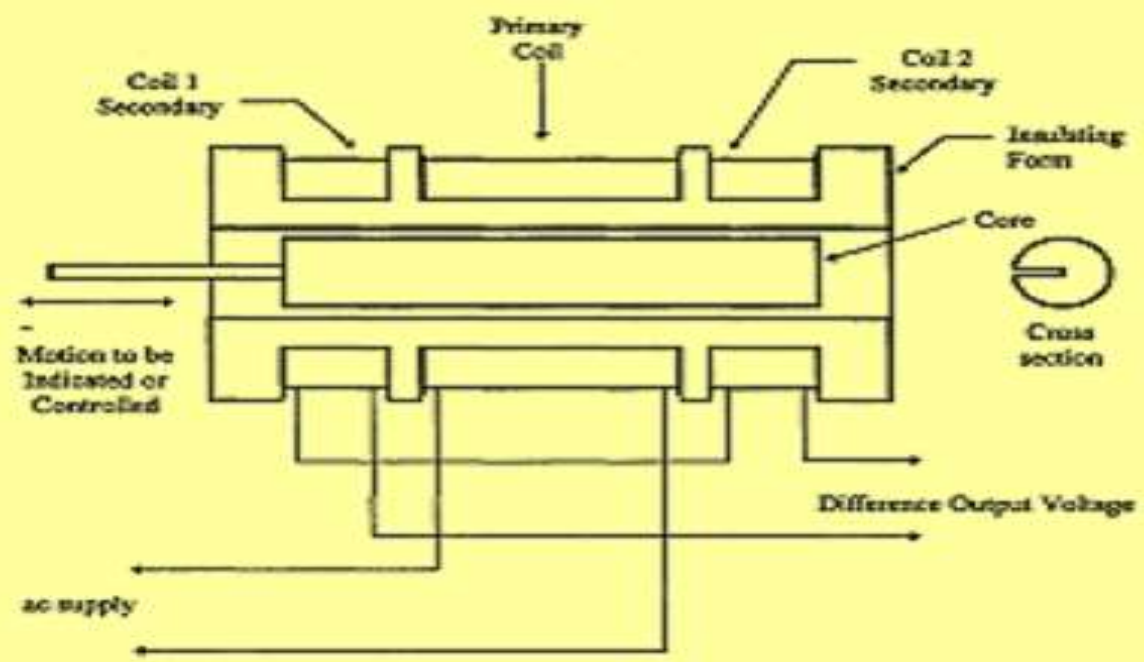
# Construction



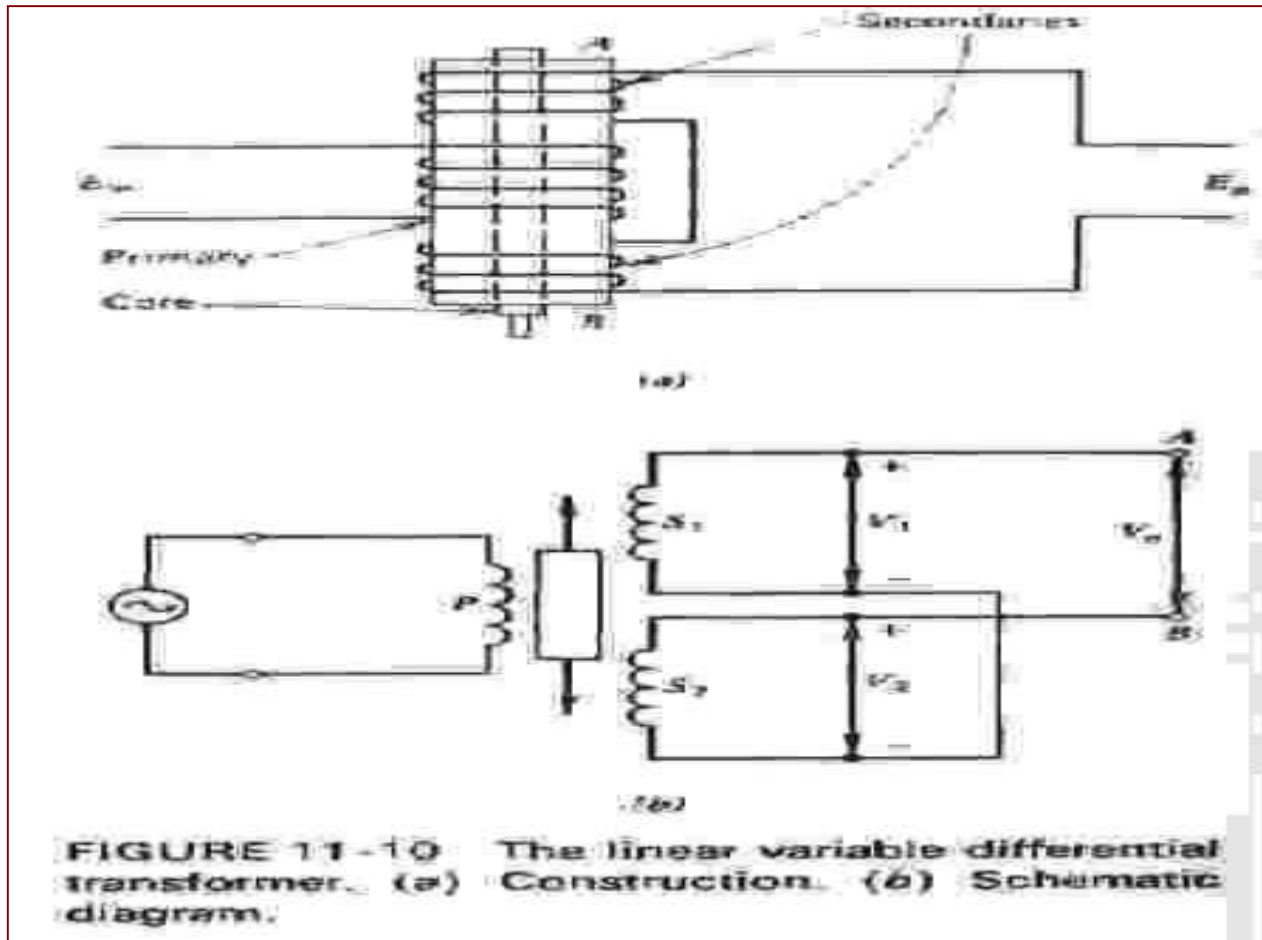
# Primary

# Secondary





# LVDT Operation



- Windings are connected “series opposing” → polarities of  $V_1$  and  $V_2$  oppose each other if we trace through the circuit from terminal A to B.
- If the core is at the center,  $V_1 = V_2$ ,  $V_o = 0$
- When the core is away from center toward  $S_1$ ,  $V_1$  is greater than  $V_2$  and the output voltage  $V_o$  will have the polarity  $V_1$ .
- When the core is away from center toward  $S_2$ ,  $V_2$  is greater than  $V_1$  and the output voltage  $V_o$  will have the polarity  $V_2$ .



# LVDT Output

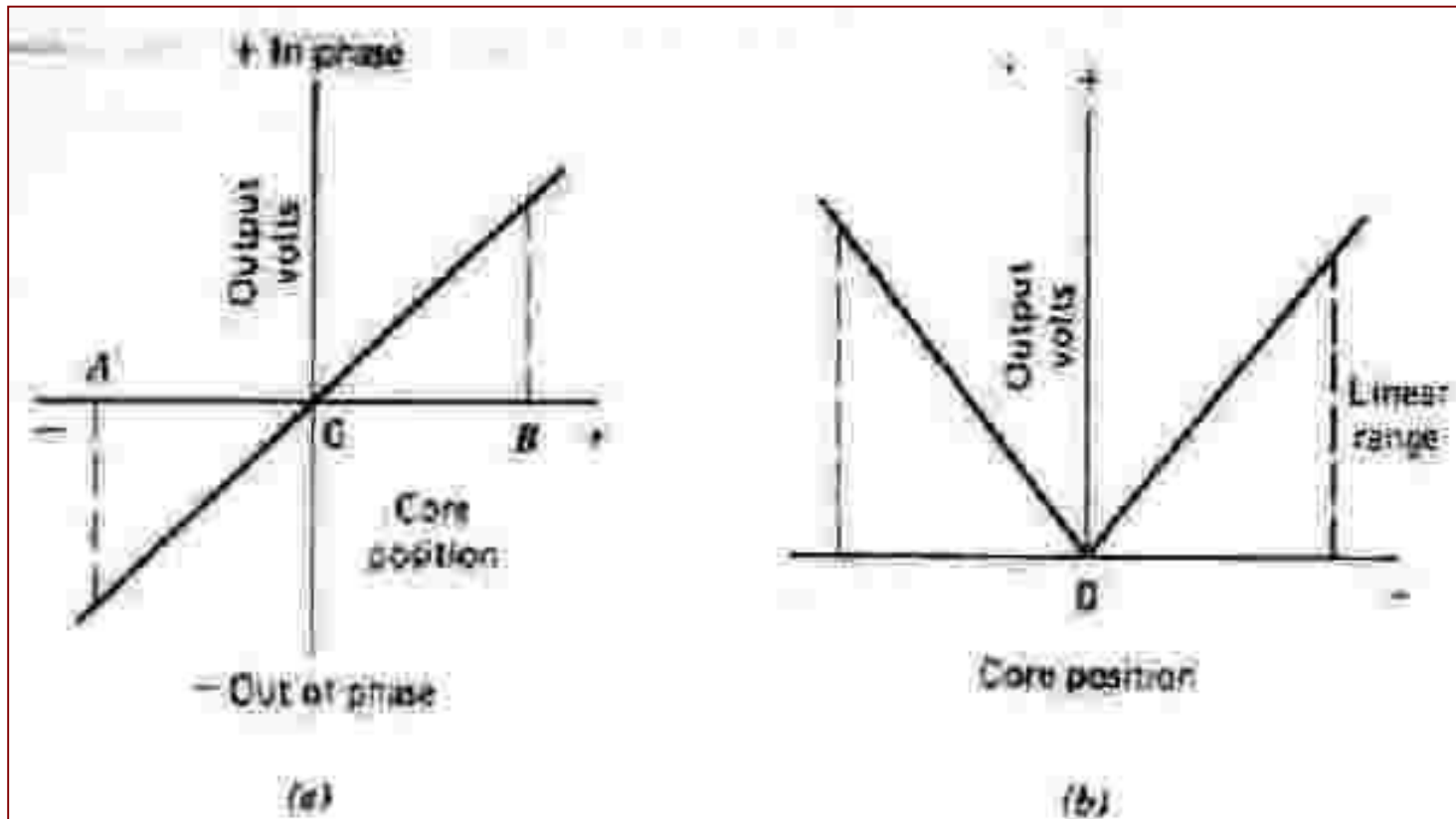
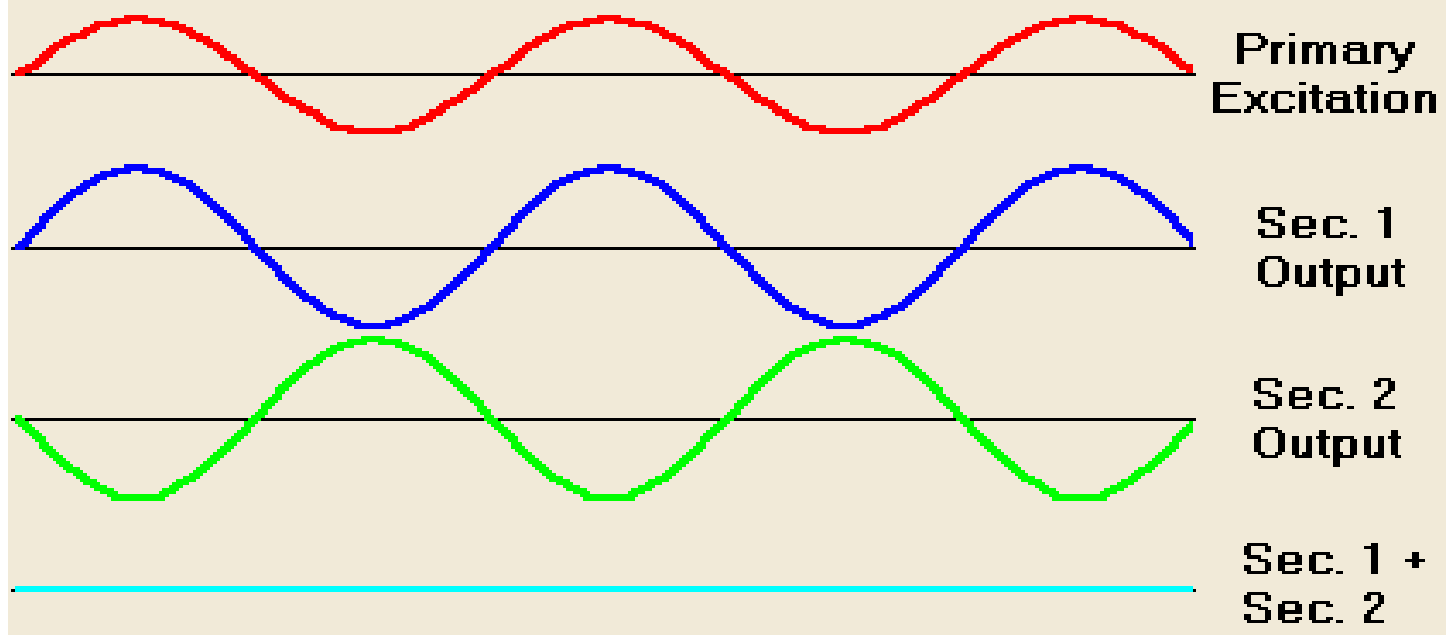
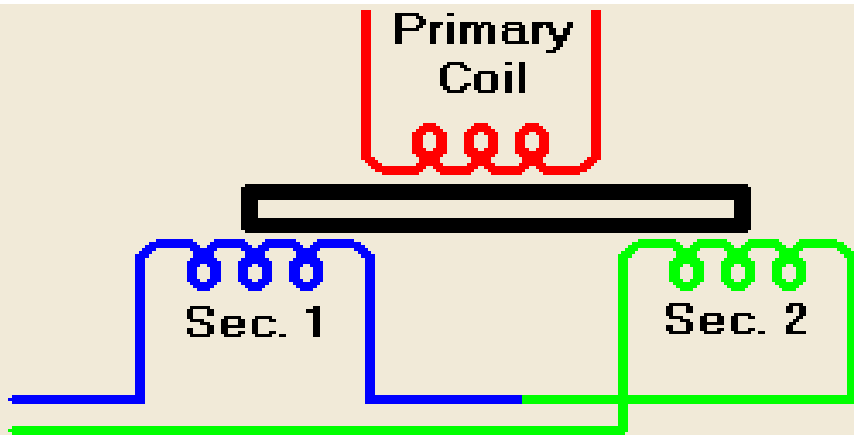


FIGURE 11-11 Output voltage. (a) Phase relationship. (b) Absolute magnitude.



# Advantages

- It produces a higher output voltages for small changes in core position.
- Low cost
- Solid and robust -capable of working in a wide variety of environments.
- No permanent damage to the LVDT if measurements exceed the designed range.

# Applications

- Used for measuring displacement and position
- Used as null detectors in feedback positioning systems in airplanes and submarines
- Used in machine tools as an input system

**Thank you**