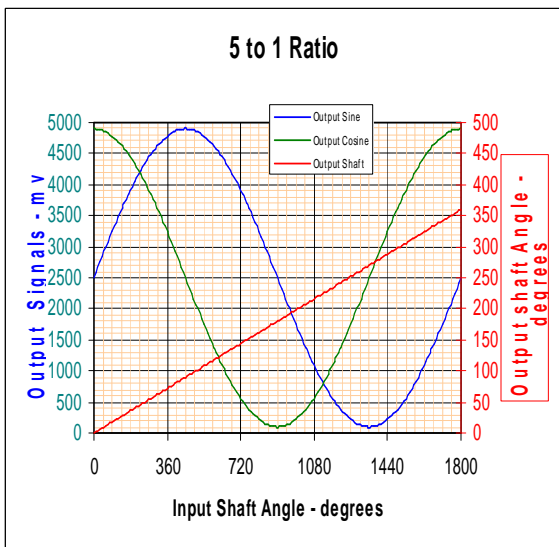
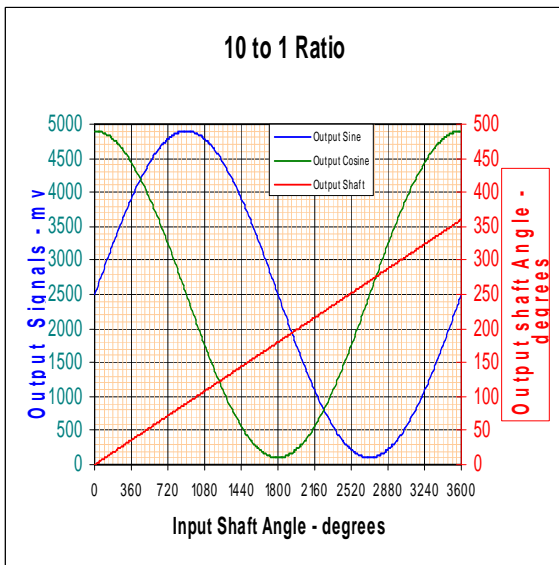


**Figure 1 – Four-turn sin-cos hallpot® resolver**



**Figure 2 – Five-turn sin-cos hallpot® resolver**



**Figure 3 – Ten-turn sin-cos hallpot® resolver**

## Multi-turn sin-cos hallpot® resolvers -----

----- are made only by elweco, inc.

hallpot® is the registered tradename of elweco, inc.

These rotational angle sensors enable the accurate angular measurement of a shaft that must rotate through several turns. They contain an internal set of gears that cause a single-turn sin-cos hallpot® resolver to rotate through one complete revolution of 360 degrees while the input shaft rotates through several turns.

The three figures show the signal response of devices with different ratios of the internal gearset.

**Output Signals – mv** are those of the **sine** and **cosine** outputs, which when decoded, give an accurate measurement of **Input Shaft Angle**.

**Output shaft Angle** is the rotation of the internal shaft of the primary sin-cos hallpot® resolver that is driven by the internal gear-train. This shaft cannot be seen or accessed.

One excellent **method of decoding** the sine and cosine signals to get shaft rotation angle is to use arctan decoding. Arctan decoding will eliminate the effects of temperature that may exist within the hallpot® resolver itself because the signals have exactly identical temperature coefficients for both the sine and cosine waveforms.

If N is the turns ratio of the assembly of 4:1, 5:1, or 10:1 as shown in the three charts, decoding of the waveforms will produce a measurement of the **Output shaft Angle** in degrees. Then the angular displacement of the input shaft is simply this number multiplied by N.

## AVAILABILITY

Multi-turn sin-cos hallpot® are available only as special orders at this time. They are being developed at the suggestions and request of several prospective users who need to retain angular position in case there is a power interruption. These devices do not wear such as multi-turn resistive potentiometers nor do they lose position from noise transients or power loss as do incremental encoders.

Elweco, Inc is developing standard and special versions. Standard versions will be stocked in small quantity. Special versions will be made-to-order.

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