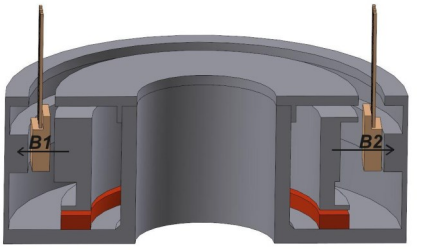
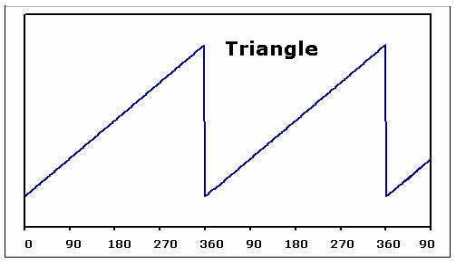
C-SIGMA

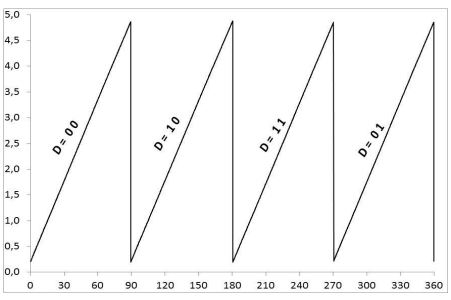
Contactless Absolute Angular Sensor

RATINGS

• Supply voltage	12V to 15V
• Consumption	40 mA
• Absolute error	± 0.5°
• Repeatability	± 0.1°
• Resolution	infinite
• Max speed	2000 rpm
• Temperature	-55° to 125°C
• Output	0-5V sawtooth
• Mass	125 gr
• H x Diameter	28 x 58mm







Output Signal Options

DESCRIPTION

Jointly developed for space applications together with CGS S.p.A. Compagnia Generale per lo Spazio (Licensee of our patent for space applications), it represents an innovative self-compensating design, which is not only suitable for the demanding environment of outer space, but also for rugged industrial applications such as railway, oil & gas, avionics (for applications other than Space, licensing is available).

- Self compensating configuration of Hall effect probes.
- Rotary Magnetics Design inherently stores angle position, no stand-by current needed to retain position information.
- Purely analogue signal processing (no software).
- Hollow shaft configuration with 14mm diam. bore.
- It withstands axial and radial misalignments up to ±100 μm.
- 0-5V 0-360° sawtooth output.
- Or 0-5V 4 x 0-90° sawtooth + 2 pins index D output (indexing the four 90° arcs), for higher accuracy applications.
- Fully redundant.

PRINCIPLE OF OPERATION

The principle of operation exploits a biasing permanent magnet generating a magnetic field in the air-gap of a rotary magnetic circuit. Hall effect probes are located at diametrically opposed positions along the air-gap. The symmetry of the magnetic circuit configuration is such that at any angular position it is

$$B(\vartheta) + B(\vartheta+\pi) = constant$$

A simple feedback loop controls the biasing current through the two serially connected probes as to ensure a constant value for the sum of their respective output signals. It can thus be shown that the output signal of each probe becomes proportional to the ratio $B(\vartheta)/[B(\vartheta)+B(\vartheta+\pi)]$. In this way any drift or degradation of the permanent magnet or of the Hall probes sensitivities (probes in a pair are matched for their thermal drift coefficients) is automatically compensated for. Indeed, the angular position is a function of geometric relationships only, making the sensor insensitive to all those drifts and degradation effects affecting in the same proportional way the two probes.

SYSTEM APPLICATIONS

- Solar Array Drive Mechanisms
- Deployment Mechanisms
- Rotary Actuators
- Contactless Replacement for Potentiometers
- Driver Brake Valve Position in Railway Vehicles EP Braking
- Valve Position Indicator for the Oil & Gas Industry