

Encoder Basics

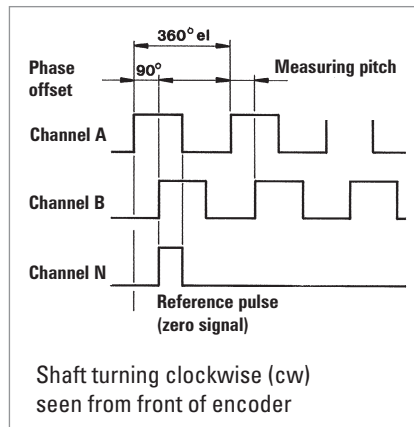
GENERAL INFORMATION

Incremental encoders are sensors capable of generating signals in response to **rotary movement**. In conjunction with mechanical conversion devices, such as rack-and-pinions, measuring wheels or spindles, incremental shaft encoders can also be used to measure **linear movement**. The shaft encoder generates a signal for each incremental change in position.

With the **optical transformation**, a line-coded disc made of metal, plastic or glass and positioned on a rotary bearing interrupts the infra red light ray emitted by gallium arsenid sender diode. The number of lines determines the resolution, i.e. the measuring points within a revolution. The interruptions of the light ray are sensed by the receptor element and electronically processed. The information is then made available as a rectangular signal at the encoder output.

Output Signals of Incremental Encoders

OUTPUT SIGNALS



The shaft encoders supply two square wave pulses offset by 90° A and B, and a reference pulse N (zero signal) as well.

In order to suppress spurious pulses, certain output circuits (RS 422 and push-pull) generate inverted signals (\bar{A} , \bar{B} , \bar{N}), such as in models RI 30, RI 36, RI 58, RI 58-H, RI 76-TD and RI 58-D.

The measuring pitch is defined as the value of the distance between two pulse edges of A and B.

EVALUATION

The resolution of a two-channel shaft encoder can be doubled or quadrupled in the subsequent circuitry.

This enables the resolution of a two-channel encoder with 2500 lines per rev. to be increased electronically to 5,000 or 10,000 pulses per revolution (see diagram below).

