



Types of Encoder tutorial

Shaft Encoders

A shaft encoder is a component which translates the rotational movement of a shaft into an electrical wave form. Shaft encoders provide motion detection because they translate the rotary motion of a shaft into either a two or a three channel output (analog or digital). The encoder feedback signal is sent to the system that controls the speed, position, and the direction of rotation of the shaft. Shaft encoders are used in many closed-loop servo applications. Typical applications include printers, plotters, tape drive, positioning tables, automatic handlers, robotics, factory automation, medical equipment and high quality instrumentation.

Encoder Classification

Rotary encoders can be classified in two ways: by detecting method and output signal. Categories for the detecting method include contact, optical, magnetic, and laser encoders, while for those for the output signal are incremental and absolute types.

Absolute Encoders

Absolute encoder provides a binary “word” for each position. Each bit requires a separate optical channel. The resolution is equal to the number of output bits. Absolute encoders are rather complex and expensive products which constantly retain the correct position for one revolution. The main advantage is that the output signal is not affected by a power shut-off. Absolute encoders are mainly used in robotic tools. Micro-Drives does not offer absolute encoders, including resolvers.

Incremental Encoders

Incremental encoders provide a pulse for each increment of shaft movement. Usually this consists of two optical channels to enable the determination of the direction of rotation. The incremental encoder has a lower cost than the absolute encoder due to the limited number of channels, is more reliable, and the encoded position is not limited to one revolution.

Optical Encoders

Light emitting elements (LED) and light receiving elements.

Magnetic Encoders

North and south poles are magnetized alternately onto a disk to which a magnetic material is attached. Output signals are obtained by means of a magnetic sensor.

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