

What's New in Rotary Encoders

Getting the encoders you need – on time and on budget

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Rotary encoders are used in an enormous variety of motion control systems – from manufacturing and packaging machinery, through medical equipment, and on to mobile machines for construction and resource extraction. Encoder manufacturer Posital has responded to these needs by offering better performing, more versatile and less costly encoders. These are manufactured in Posital's innovative 'mass customization' production system that builds encoders according to customers' exact specifications and can usually have them delivered within a few days.



Encoders come in a wide variety of mechanical configurations

Incremental or absolute measurements – or both!

Incremental Encoders are well suited for speed control, since they produce a stream of pulses at a rate that is directly proportional to the speed of rotation. **Absolute Encoders**, meanwhile, output a multi-byte digital signal that reports the absolute rotary position (angle) of the encoder's shaft at an instant of time. This makes them ideal for position control applications. Need both capabilities? Special hybrid models are available from Posital that provide both types of output from a single device.

Posital multiturn absolute magnetic encoders have measurement ranges of several million revolutions. These devices use Wiegand technology to harvest the energy needed to activate the rotation counter, eliminating the need for backup batteries, and significantly reducing maintenance requirements.

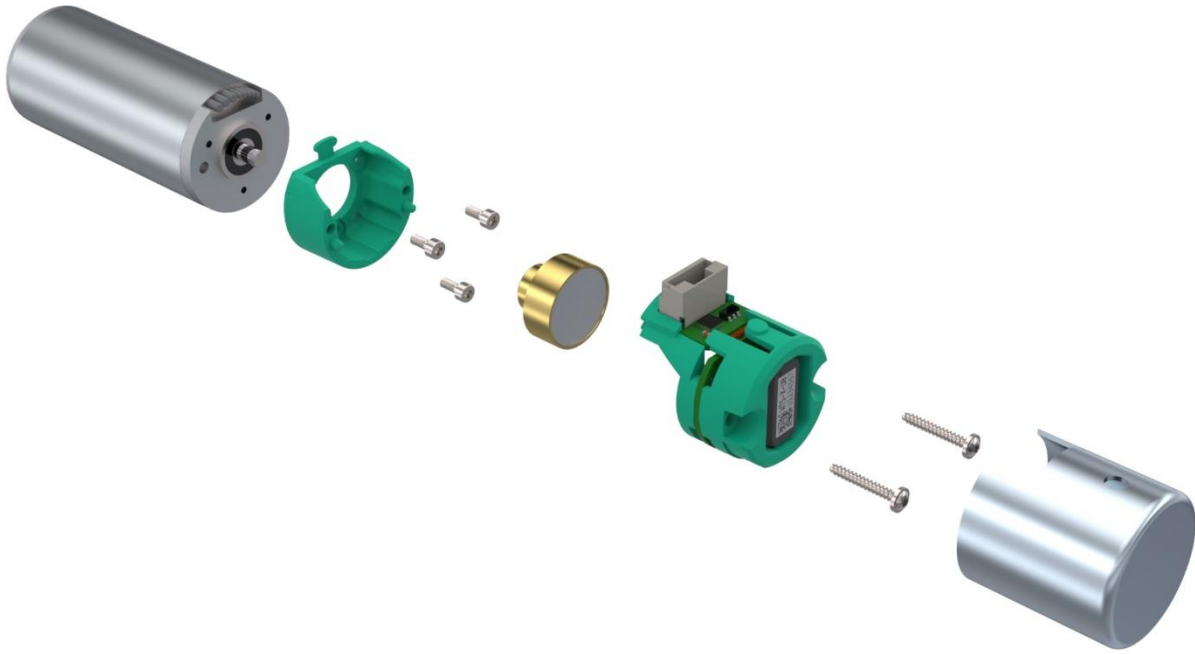
The right performance characteristics

While optical encoders were once favoured for their high accuracy and dynamic response, high-performance magnetic or capacitive encoders based on magnetic or capacitive measurement technologies can now deliver the performance needed by all but the most extreme applications in compact, rugged, cost-effective packages. These devices typically employ an embedded microcontroller to handle signal processing and communications, with many of their measurement characteristics defined in the device's firmware. This means that the performance of these encoders can be modified through software updates. For with Posital's programmable incremental encoders, for example, resolution can be set anywhere between 1 and 16,384 PPR (pulses per revolution) through simple software changes. No mechanical modifications are required so that standard products can be tailored to meet a wide range of application requirements at minimal cost.

The right mechanical configuration

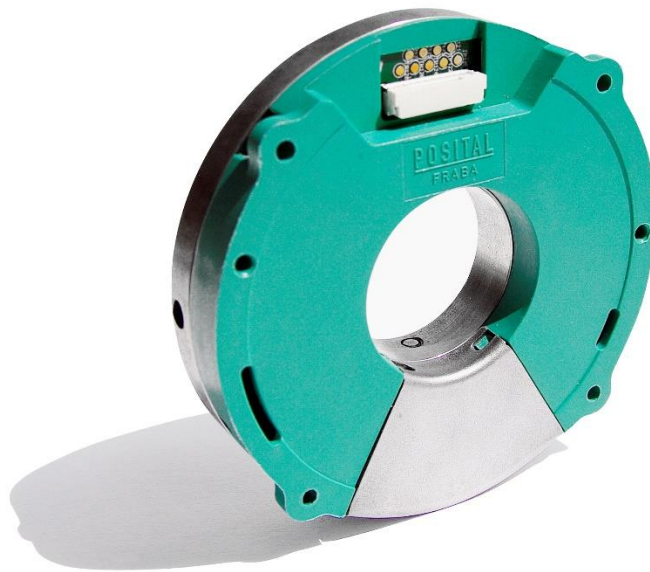
Designers, machine builders and system integrators benefit from being able to select devices with the right packaging (size, flange design, ratings, etc.) the right mechanical connections (shaft size and configuration) and the right electronic connectivity (connector type and communications interface). Posital's special 'build to order' manufacturing system can assemble encoders with the right mix of mechanical components, fully test their performance and have them shipped to customers in a matter of days.

As well as offering a very wide variety of packaging options for their self-contained encoders, Posital also provides a range of 'kit' encoders: separate measurement modules that are designed to be built into a motor's housing, measuring shaft rotation directly. This eliminates the need for a separate encoder shaft, bearing, and seal, so that kit encoders can be more compact and less expensive than their standalone counterparts. Adding motion feedback capabilities effectively turns a motor into a servomotor – an ideal solution for many motion control applications. Posital magnetic kit encoders are available in a 36 mm diameter package or in the newly introduced 22 mm miniature form factor.



Kit encoder for integrated motor feedback

For special applications where it would be helpful to position the encoder mechanism around a central drive shaft or other structural component, hollow-centre capacitive encoders offer a good alternative.



Hollow shaft kit encoder

The right communications interface

Posital encoders are available with a wide range of communications interface options. This includes both connectors (M12, M23, D-Sub etc.) and communications protocols (Fieldbus, Industrial Ethernet etc.).

Small, isolated machines can make effective use of simple point-to-point connections, either analog or digital. This approach offers simplicity and relatively low cost.

Fieldbus networks such as CAN, PROFIBUS and DeviceNet are well-proven and cost-effective solutions for applications. Multiple devices share a common communications backbone (bus), simplifying the wiring system when multiple sensors and actuators are connected. Fieldbus networks are used in applications that range from conveyors and manufacturing facilities to mobile equipment, medical equipment, wind turbines, solar panels and beyond.

Industrial Ethernet uses the same core technology as the millions of commercial and domestic LANs that have been installed around the world, allowing industrial users to take advantage of the enormous base of products and experience that has accumulated around Ethernet standards (IEEE 802.x). However, the conditions in factories are often much harsher than in a typical office environment. As well, industrial automation often requires controls to operate in real time, without the data transmission delays that can occur in 'ordinary' Ethernet networks. For these reasons, Industrial Ethernet systems incorporate special features at both the hardware and software levels aimed at improving robustness and performance. Examples include PROFINET, EtherNet/IP, and ETHERNET POWERLINK.



Finding what you need: Product Finder and Encoder Match

Choosing an encoder that is exactly matched to the requirements of a job can save time and money by eliminating the need for design compromises and work-arounds. However, with the enormous range of possibilities, finding the right device can be difficult. Selection tools such as POSITAL's **Product Finder** provide an efficient way of zeroing in on configurations that deliver the right results. Customers can click on buttons to select the features they need, such as flange type, measurement range, communications

interface, resolution, and degree of protection. The product finder system will confirm that this configuration is feasible – even if that exact configuration has never been built before – and provide a part number, data sheets and, in many cases, CAD drawings. Once an order has been placed with a distributor or an online retailer such as Amazon, the product can usually be delivered within a few days.

A more recent innovation has been Posital's new **Encoder Match** tool (www.EncoderMatch.com). This is a portal designed to support maintenance staff by enabling them to quickly source plug-in replacements for worn out or defective incremental encoders from many manufacturers by simply specifying the original brand and product number.



ENCODERMATCH

POSITAL

Encoder Match helps maintenance personnel find the replacement encoders they need