Absolute Encoders for Medical Imaging Systems

Medical imaging systems play a crucial role in diagnosing and monitoring various medical conditions.

These systems use different technologies to create detailed images of the internal structures of the human body. The most common medical imaging systems include:

X Rays: X-ray machines capture transmitted radiation to create a two-dimensional image. Dense tissues like bones absorb X-rays which appear white on the image, while less dense muscles or organs allow X-rays to pass through and appear darker.

Computed Tomography (CT) Scanners: CT scans use X-rays, but they rotate around the body and they include detectors that create a detailed cross-sectional image or "slice" of the body.

Magnetic Resonance Imaging (MRI): uses a strong magnetic field and radio-frequency pulses to create images of soft tissues, joints or the interior of organs. When patients are exposed to the radio-frequency pulses, hydrogen atoms in the body emit signals that are detected by the scanner, which generates a detailed image.

Ultrasound Imaging: uses high-frequency sound waves to create real-time images of internal structures. Ultrasound is used for imaging the abdomen or pelvis, and the real-time nature of ultrasound is valuable for visualizing movement, such as blood flow.

Each of these imaging modalities provide detailed information that helps healthcare professionals diagnose and plan treatments for various medical conditions. They all require motion solutions.

Typical Motion Solutions:

- Brushless motor with leadscrew or ballscrew linear stage.
- Brushless motors may be sensor-less when coupled with an absolute encoder. Brushless motor drive with serial interface for encoder feedback.

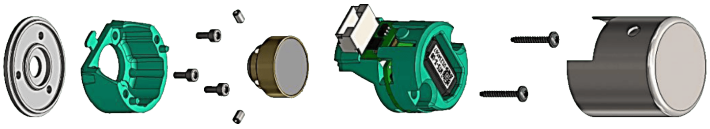
Application Description:

In the event of a power loss on any of these machines, the motion systems powering them can move. Once power is restored, the control system may not know the precise position of the motion system. Absolute encoders address this problem. They provide an added safety method for each of these medical imaging systems, where positioning is critical to capture the desired result.

Application Challenges:

The single-turn functionality of absolute encoders can provide equivalent hall sensor outputs to show rotor position for brushless motors. The hall signals relative to the stator phases are programmable, giving added flexibility during installation.

When coupled with a leadscrew, the multi-turn functionality provides the number of turns the screw has turned from its zero position. This information can identify a carriage position at any time. The rotor shaft zero-position is programmed at the factory and stored in the encoder. The zero-position can be reprogrammed at any time with the proper tools.



Absolute encoders provide position information over serial interfaces such as SSI or BISS. Absolute encoders are larger than incremental encoders but provide much more information on absolute rotor position and can sense and store movements when power is off. When power is restored, the system knows the exact position of the motion system.

For more information on which encoder is right for your application, click here or Contact Us Today.

Headquarters
Haydon Kerk Motion Solutions, Inc
Haydon Products Division
1500 Meriden Road
Waterbury, CT 06705 USA

+1 800 243 2715 (Toll Free)
+1 203 756 8724 (Fax)
+1 203 756 7441 (International)
info.haydonkerk@ametek.com
www.HaydonKerkPittman.com

Locations
Waterbury, CT
Milford, NH
Harleysville, PA
New District, Changzhou, China
Jiuting, Shanghai, China
Bouguenais, France
Pegnitz, Germany
Bangalore, India
Suwon-city, Gyeonggi-do, Korea
Penang, Malaysia
Reynosa, Tamaulipas, Mexico