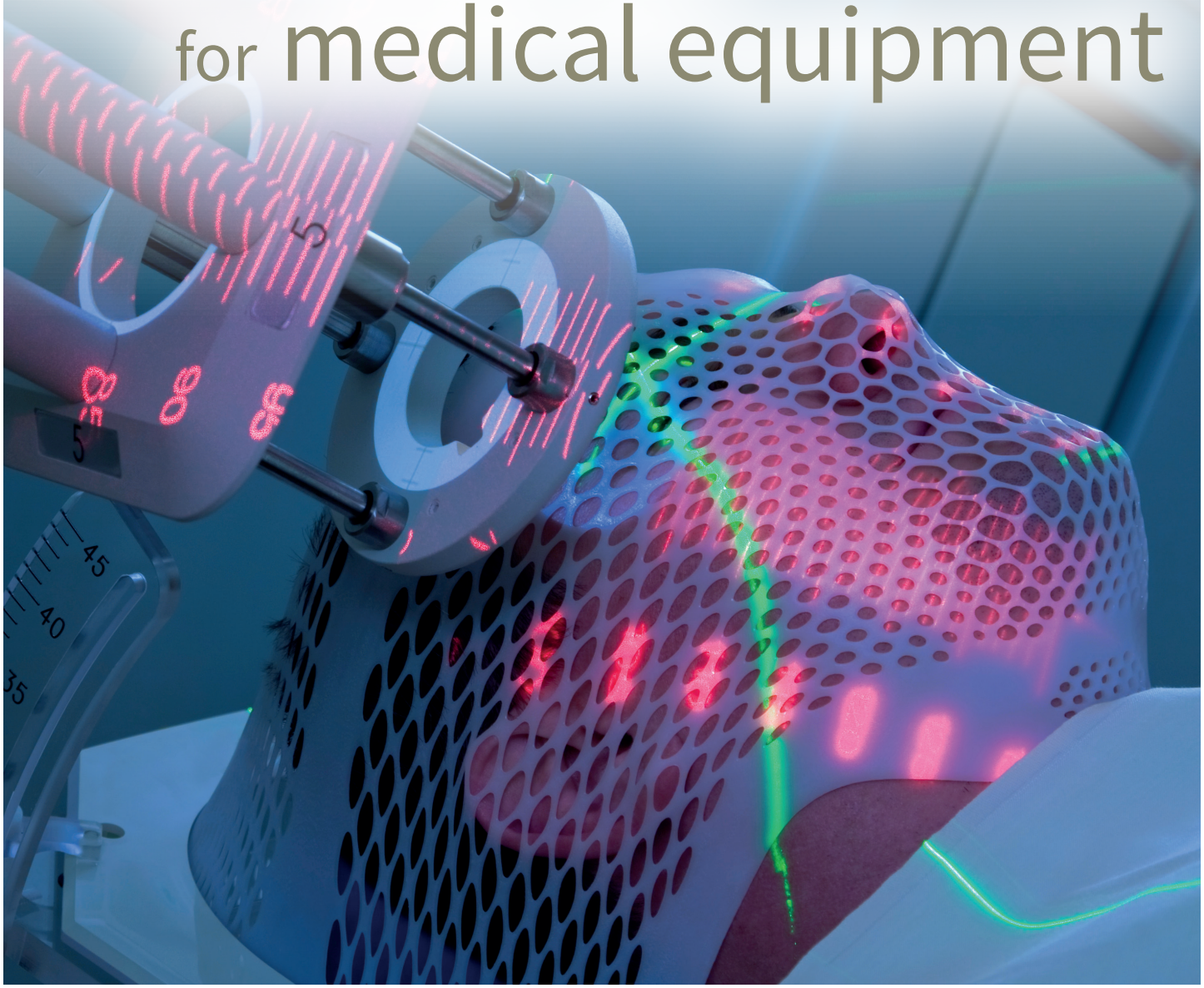
Rotary Encoders

Highest precision for medical equipment



HENGSTLER

BEYOND THE STANDARD

Precise, robust and very compact

Rotary encoders for demanding applications in medical technology

Hengstler encoders ensure that medical diagnostic and therapeutic devices function precisely and reliably around the globe. The encoders are ideal for use in computer tomographs, surgical robots or exoskeletons. On request, they can even be adapted exactly to the application.

In addition to the high accuracy and repeatability, medical technology manufacturers particularly appreciate the robustness and compact design of the rotary encoders. Beside highest precision class, AD36 Multiturn offers uniquely an 8mm through hollow shaft. The AD36 delivers fully digital position data with a resolution of up to 22 bits (single turn) and 12 bits (multiturn) via a two-way synchronous interface with a variable clock rate of up to 10 MHz.

The ACURO AD35 will be the right choice, where less space would be available and no need for Multiturn measuring, offering 22 bit in highest accuracy as well. Like the ACURO AD36, it is therefore predestined for the precise positioning of imaging units in mammography systems and CTs as well as for the precise alignment of the patient beds of MRTs or PET scanners/ gamma cameras in nuclear medicine. Both the AD36 and the AD35 have a high electromagnetic compatibility. The encoders therefore do not impair the function of imaging diagnostic systems, nor are they damaged by their radiation.

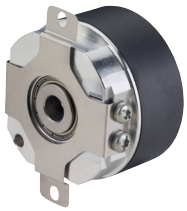
Like the ACURO AD35, the AD36 is also used in surgical robots and exoskeletons. In surgical robots, the rotary encoders take over the absolutely precise alignment of the surgical cutlery. In exoskeletons, they score with their low weight and compactness: With a construction depth of only 23.65 mm, the AD35 is the shortest hollow wave encoder in the world.

HGlasses grinding usually do not require absolute systems, so manufactures of tracers and grinding machines rely on ICURO RI32 and RI36 from Hengstler.
Within small dimensions appropriate resolutions of 1500 or 3600 ppr are offered to allow precise adaption to the choosen shape. These enoders are also insensitive to electromagnetic fields acting during processing.

Examples of typical application:

- Angiography /X-ray imaging
- CT - computer tomography
- MR - magnetic resonance tomography
- Nuclear (gamma cameras)
- Mammography
- Invasive Surgery Robots / Surgical Robotics
- Non-Invasive Surgery Robots
- Rehabilitation Robots
- Laboratory Robots
- LINAC machine

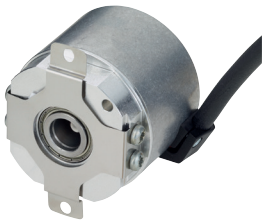
ACURO® AD35



Compact size

- **Compact design: 24 mm mounting depth**
- **Resolution up to 22 Bit Singleturn**
- **High accuracy +/- 35"**
- Operating temperature up to +120°C
- 10,000 rpm continuous operation
- **Interfaces: SSI, BiSS-B or BiSS-C**
- Option Sine wave 1 Vpp
- Hub shaft shaft 8 mm
- Bandwidth 500 kHz
- **Also available as version for use in Vacuum**
- **Modifications of shaft style, mechanical interface or connection on request**

ACURO® AD36



Compact size

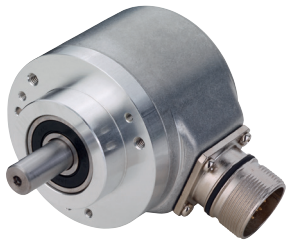
- **Compact design: 33,5 mm mounting depth**
- **Resolution up to 22 Bit Singleturn**
- **High accuracy +/- 35"**
- Operating temperature up to +120°C
- 10,000 rpm continuous operation
- Optical encoder with a true geared Multiturn
- **Interfaces: SSI, BiSS-B or BiSS-C**
- Option Sine wave 1 Vpp
- Hub shaft or through hollow shaft 8 mm
- Bandwidth 500 kHz
- Resolver size 15 compatible
- **Also available as version for use in Vacuum**
- **Modifications of shaft style, mechanical interface or connection on request**

ACURO® AC36

Compact size ST/MT

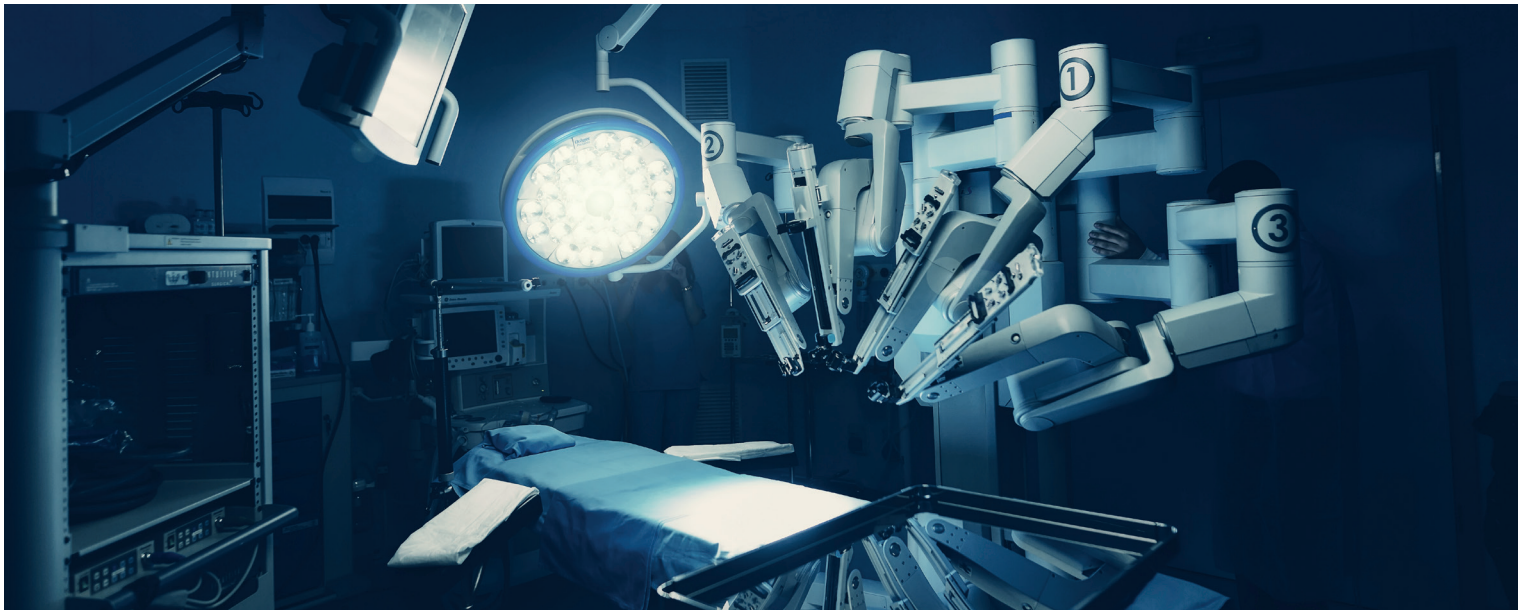
- **Overall length: 36 mm**
- **Resolution up to 22 Bit Singleturn + 12 Bit Multiturn**
- **High accuracy +/- 35"**
- 6mm solid shaft or 8mm hubshaft
- Wide temperature range of -40°C ... +100°C
- Protection class IP64
- 10,000 rpm continuous operation
- Optical encoder with a true geared Multiturn
- **Interfaces: SSI, BiSS-B or BiSS-C**
- Optional Sine wave 1 Vpp
- Bandwidth 500 kHz
- 360° full screen

ACURO® AC58



Wide range of configurations

- Solid or hollow shaft versions available
- Wide temperature range of -40°C ... + 100°C
- Resolution up to 22 Bit Singleturn + 12 Bit Multiturn
- **High EMC – Resistance**
- Optical encoder with a true geared Multiturn
- Housing diameter 58 mm
- **Interfaces: EtherCAT, Profinet, Ethernet-IP, Profibus, CANopen, DeviceNet, CAN Layer 2, Interbus, SSI, Parallel, BiSS-B and BiSS-C, OPC UA ready for IIoT**
- MT Absolute SSI encoder + Incremental output TTL or HTL
- Wide range of programmable functions
- 10,000 rpm continuous operation
- High shock and vibration resistance
- Large number of configuration options
- Stainless steel as ACURO® AC59 and AC61 available

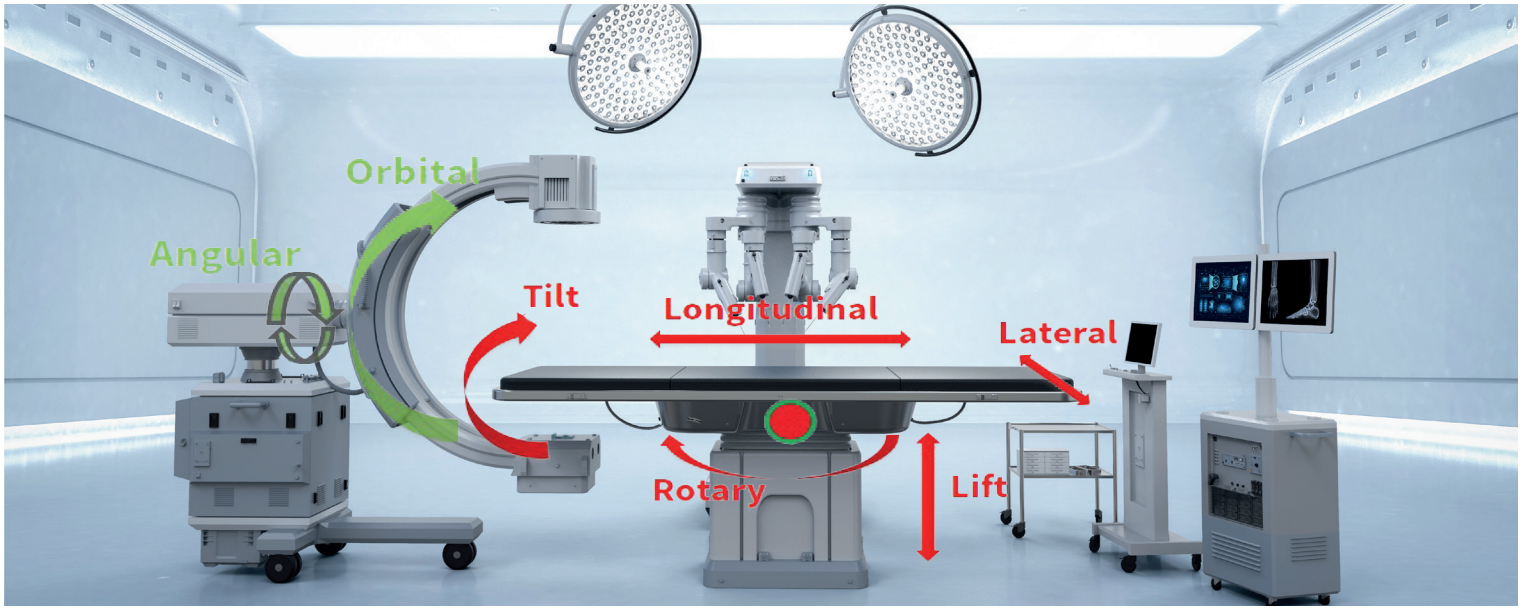


Incremental Encoders

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 infrared 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.

Absolute Encoders

Absolute rotary encoders, also known as angle encoders, are by no means used only to detect angular positions. They are also suitable for linear movements that can be converted into rotary movements by a toothed belt, drive pinion, or wire winch.
The special feature of absolute shaft encoders is that they assign a unique, digitally encoded signal to each individual measured increment. The method of transducing prevents erroneous readings, whether by a power failure, or by a transient malfunction. After the encoder is switched on again, or power is restored, the position can be read out. It is not necessary to move to a reference position, as it is for shaft encoders of the incremental type.



ICURO®
RI32

Compact size, high inteference protection

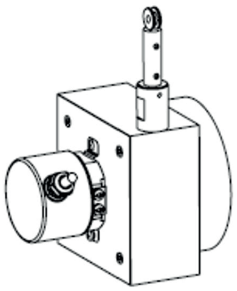
- Small rotary encoder for medical applications
- Incremental TTL or HTL
- Up to 6,000 steps with 1,500 pulses
- Bandwidth: 300 kHz
- **Very compact design: 30 mm housing diameter / mounting depth 27 mm**
- Protection class up to IP64
- Solid shaft Ø 5 mm
- Temperature range: -10°C … +70°C
- Low current consumption
- Suitable for high pulse frequencies
- 360° full screen

ICURO®
RI36

Compact size, high inteference protection

- Small rotary encoder for medical applications
- **Compact design: 36 mm housing diameter / mounting depth 27 mm**
- Up to 14.400 steps with 3.600 pulses
- Incremental TTL or HTL
- Protection class up to IP64
- Solid or hollow shaft versions
- Temperature range: -10 ° C… + 70 ° C.
- Low current consumption
- **High interference protection**
- Suitable for high pulse frequencies
- 360° full screen
- Wide-range power supply 3-38 VDC

Customized Cable Pulleys



- Customized rope length
- AC58, AC36, AD34, or RI36 mounted

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