

Advantages of Installing Draw-Wire Encoders

Draw-wire encoders are a little-known type of measuring system.

So they are occasionally taken into consideration when it comes to designing a new solution for industrial applications. Yet there are a number of good reasons why designers should appreciate their functional characteristics and discover that sometimes they can be an excellent answer to measuring needs.

What is a draw-wire encoder?

A draw-wire encoder is a measuring system that is basically made up of two parts integrated in the single device:

1. a rotary encoder, it can be either optical or magnetic, with incremental, absolute, and analogue outputs (a potentiometer can be installed as well);

2. a stainless-steel measuring wire having different lengths (Lika's range varies from 2 m up to 50 m / from 3.28 ft up to 164 ft). It is wound on a spring-wired drum and then pulled out and rewound during operation.

The stainless-steel wire is attached to the moving axis being measured. The encoder is coupled to the spring-wired drum, so as the cable moves back and forth, the encoder is rotated. In this way, **the linear motion of the wire is translated into a rotary motion by the drum and then into a positional information by the encoder.**

Additionally, the wire's flexibility enables curved travels through guiding rollers.

Why a draw-wire encoder?

Consider that the encoder-drum assembly (the fixed and also the most delicate part of the device) and the stainless-steel wire that is attached to the mechanism to be measured (the mobile and also the most rugged part) can be considered in some way as two separate components.

Thus, the encoder-drum assembly can be installed away from the wire and the axis to be monitored. For this reason, the assembly can be mounted in a safe, easily accessible, and adequately protected place while the stainless-steel cable, installed in a separate place, can be submitted to harsh environmental conditions at the same time, i.e. dirty, humidity, high temperatures, etc. Furthermore, by virtue of the small footprint of the cable, **the operational space required by the wire can be very tight, even a few centimetres wide**, since the encoder can be mounted in a different and larger place.

A further benefit is that **the cable-pulling mechanism can be coupled to any encoder** which preserves the same complete set of functions as the standard encoder. This provides excellent flexibility in terms of applications and environments.

Lika's range includes the following versions:

- **with programmable incremental encoder:**
resolution down to 0.01 mm / 10 µm (16,384 PPR), Universal output circuit HTL/TTL, fully configurable according to needs via free software tool;
- **with SSI and analogue absolute encoder:**
resolution down to 0.012 mm / 12 µm; analogue version with TEACH-IN buttons and overrun safety function, current and voltage options;
- **with Ethernet and fieldbus absolute encoder:**
Profinet, EtherNet/IP, EtherCAT, POWERLINK, MODBUS TCP, Profibus, CANopen, DeviceNet, MODBUS RTU. This allows the Ethernet technology to be available in the most uncomfortable conditions (the narrowest spaces, harsh industrial environment). Resolution down to 0.024 mm / 24 µm, full set of configuration and diagnostic parameters: position and velocity readout, full scaling, preset, code sequence, extensive diagnostics, Ethernet and bus network settings;
- **string-pot:** resistance output 1 to 20 kΩ, current and voltage output;
- **with ATEX incremental and absolute encoder:**
Category 2 ATEX encoder for use in zones 1, 2, 21, 22 and Category 3 ATEX encoder for use in zones 2, 22 with ultra-rugged enclosure, oversized frame walls and IP65 protection rate;
- **special encoder versions** designed for individual applications such as draw-wire encoders for shipbuilding industry, marine installations and offshore facilities with stainless steel enclosures and special surface treatments and sealings for protection against salt water and corrosion.

When to install a draw-wire encoder?

A wire-actuated encoder can replace a standard encoder in many uses. It can be a useful and cost-effective solution, for instance, **when the operational space is constricted or the environmental conditions are severe.** The encoder body in fact can be mounted in a safe place, easily accessible, and adequately protected place.

While the measuring wire requires minimum space and can be subjected to harsher conditions.

Typical applications are mobile equipment and construction machinery (outriggers, stabilizing slides, booms), telescopic cranes, bucket trucks, forklift trucks, automated guided vehicles, agricultural/forestry machinery and equipment, scissor lifts, car lifts, loading platforms, warehouses, electro-medical equipment (computed tomography scans, operation and examination tables, hospital beds and dentist's chairs, etc.).

Check out Lika's full [draw-wire offering](#) or [download](#) our catalog.

To find answers to all your questions please contact our team!



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