



WHITE PAPER:

Tidy and safe cable guidance for operating panels

Cable reel with spiral guide and no slip ring

iglus®

Introduction

Where robots or machine tools are used for machining large components, systems are programmed or configured via mobile operating panels so the programmer can remain close to the robot tool and have a close view of the process.

With a newly developed cable reel for control panels, robot users avoid tangled cables and trip hazards in automated production. Since the new solution does not use slip rings, media, data, and the power and signal supply of the emergency stop button can also be integrated into the system.

State of the Art: Exposed Cable

The previous “state of the art” solutions for connecting the machine and mobile operating panel are simple and widespread, but no longer very effective. The programmer takes the panel from a holder on the protective housing or the machine and then usually drags a cable along behind, which simply lies on the floor and — depending on the operator — remains there or is just reeled up on the holder.

This is probably the most common and — from the point of view of occupational safety — the worst solution, because the cable represents a source of danger as a trip hazard or may be damaged when run over by industrial vehicles. The first issue is being raised more and more frequently by employers’ liability insurance associations. The second issue can shut down an entire plant. As the saying goes, “small cause — big effect”.

- Many robots are equipped with mobile wired operating/programming panels
- The operator handles the panel
- Often there is no effective solution for cable guidance

Alternative: Cable Drum with Slip Ring

The usual alternatives to the above solutions are cable reels, which use slip rings for energy and signal transmission in a rotating drum. In this way the user solves the problem of towing cables lying freely on the floor. But these cable

drums are often only available as a complete package with a new cable, and the fast transmission of large amounts of data and media such as compressed air is very complicated with slip rings. Therefore this solution is by no means ideal.

- Conventional cable reels are not a suitable alternative

Third and New Option: Cable Reel with Spiral Guide Instead of Slip Ring

This initial situation was incentive enough for igus as specialists for the guidance of moving cables to develop a new and, from the user’s point of view, satisfactory solution in every respect. This solution with the designation e-spool flex 2.0 is now ready for high volume production and — in the first expansion stage — available from stock.

The e-spool flex 2.0 is a cable reel that allows cables to be guided from start to end without slip rings or other connecting elements. This is made possible by a spiral guide which reels the cable in a controlled manner when it is rolled up.

- Newly developed cable reel solution
- Spiral guide instead of slip ring



The ideal solution for the orderly and safe cable connection of mobile control panels: the slip-ring-free cable reel.

Source: igus®

Uninterrupted Cable Guidance

This new type of cable reel can carry all cables and hoses for the transmission of energy, signals, data, liquids, compressed air and vacuum without interruption.

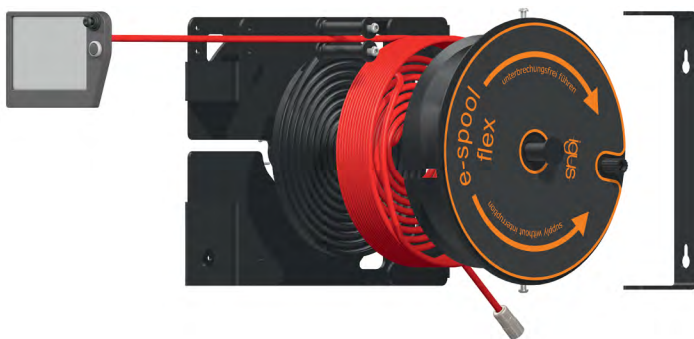
Fully harnessed cables can thereby be used, and can be inserted into the drum in a few easy steps (Picture 2). The user simply inserts the cable into the spiral guide and fastens the cable stowed in the outer and winding housing of the e-spool flex 2.0.



The e-spool® flex 2.0 from the inside and outside in detail. From the left respectively: housing, spiral guide, cables/hoses, winding housing.

Source: igus®

Constant tensile strain is thereby guaranteed, and the latching function of the e-spool flex 2.0 allows comfortable operation of the panel. And the much-discussed question in practice as to whether or not the emergency stop button installed on the operating panels may be supplied with energy and signals via slip rings — which are subject to wear and tear — has also been resolved with the use of the slip-ring-free cable reel.



The e-spool® flex 2.0 can be used wherever a cable must be moved freely during use and must be stowed away safely and cleanly after use

Source: igus®

With this specification, the e-spool flex 2.0 is also suitable for retrofitting existing cables, and for guiding bus cables and hoses for compressed air, vacuum, and liquids. The entire system is housed in a compact installation space and can be installed right on the machine enclosure or safety fence.

- Spiral guide ensures clean winding of the cable
- Uninterrupted guidance of power, signal, and media cables
- Compact type as a prerequisite for universal application

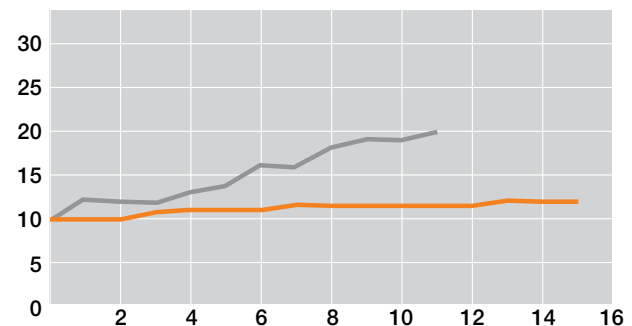
Extension Lengths up to 15 Meters — also as “readychain®”

The e-spool flex is available in three sizes for cables with a diameter of 5 – 15 millimeters and an extension length of 5 – 15 meters. The cables can be quickly replaced at any time. In addition to a subsequent connection of the e-spool flex 2.0 with an existing cable, igus also offers the cable reel solution as “readychain” or, better said, “readyspool”, fully harnessed with chainflex cables specifically designed for moving applications and with cables of other manufacturers.

The new e-spool flex is available in four versions:

- As a low-cost version with a hand wheel to rewind the cable
- As a tool variant for cable reeling with cordless or pneumatic screwdriver
- As an automatic solution with spring-operated retraction mechanism
- As a version with spring drive and additional brake (in development)

All options are characterized by uniform extraction forces, as comparative tests with a competitive product have shown. A cable drum with slip ring was used for comparison, for an obvious reason: a cable drum that manages without slip rings, just like the e-spool flex 2.0, is not known at igus.



Results of a comparison test in the igus® test laboratory:

The extraction forces of the e-spool® flex 2.0 were at a constant of approx. 10 Newton. Those of the competitive product were significantly higher and also uneven.

Source: igus®

- Cable up to 15mm diameter
- Cable length up to 15mm
- Manual or spring-supported winding, with or without brake
- Also available as ready-to-fit “readyspool”
- Low and uniform extraction forces

Application: Not Only for Robotics and Machine Tools

The “classic” applications for this new type of movable energy supply system will certainly be the external operating/programming panel for robots as well as operating units of (larger) machine tools. From the operator’s point of view, they enable the programming of motion sequences, usually with the protective device open and in teach mode or in the designated operating modes conforming to the standards (“set-up mode”, “operation at reduced speed”).

In addition, there are many other possible applications, such as the convenient guidance and height adjustment of suspended operating units, as used on indoor cranes, for example. Further areas of application are laboratories and test facilities as well as medical technology.

- Main target market robotics and machine tools
- Also for hanging applications

Additional Content

Webinar:

Learn about igus® e-spool - a versatile & slip ring free alternative

White Paper:

e-spool®: The next generation of the cable reel