

## Light and open - multi-axis energy supply with extendible chain link

New: igus launches a light version of its "Triflex Robot" on the market

The energy supply system Triflex R for multi-dimensional robot movements, introduced just over a year ago by igus (Cologne) and used by companies including Bayer or Daimler Chrysler, is now also available in an open "light" version for quick installation. The energy chain manufacturer presented its new low-cost version Triflex R light, for less complex 3D applications, at the Hanover Industrial Fair 2005. Harald Nehring, authorized manager for energy chain systems at



Picture PM0705-01: igus GmbH, Cologne

*Light and smooth: new "light" version of the multi-axis igus energy chain Triflex R.*

igus: "We have translated the design principle of our enclosed design - Triflex R for cable guiding with production robots - into a 'light' version: hose mobility as well as stability of the chain with defined bending freedom in every direction." Triflex R light is much lighter in weight. Like Triflex R, it is available in four sizes and reliably performs even complex multi-axis handling tasks. The new modular "light" long-life energy supply has been developed for a wide range of different applications. These include applications such as tool changers, calibration applications, automatic image processing, laser and adhesive applications, or handling applications, which often involve inserting large numbers of thin initiator cables.

### Shortening and lengthening options

Triflex R light consists of as few parts as possible, and is a series of one and the same individual part. Users can shorten and lengthen the energy chain at virtually any point. Harald Nehring: "This not

only guarantees variability, it means there is no waste whatsoever - only one aspect of this extremely light and thus cost-optimised 3D energy supply system." What's more, Triflex R light doesn't need any additional reinforcements such as steel ropes.

### Tension-proof thanks to "trailer principle"

The so-called trailer principle guarantees a high degree of tension resistance. This works in the same way as an automotive trailer coupling. Once locked in place, ball and ball socket form an extremely mobile connection which combines smooth movements in all three axes and an optimum flow of force. Harald Nehring: "The energy chain has to be able to follow specific handling movements in all axes for a long time." Longitudinal axis torsion of up to +/- 380° per metre is also possible. Thanks to the clear and stable inner fastening points, Triflex R light provides a limiting minimum bending radius (radii: 58, 87, 110 and 145 mm) which goes easy on cables in both radial and torsional movements. This

results in a significant reduction in cable stress and consequently an extension of cable service life for problem-free energy and media supplies, with the smooth inner contour also advantageous for the cables.

### **Quick to assemble and flexible**

Thanks to the "EasyChain" principle developed by igus - an opening the cables are simply pushed into - the energy chain is easy to fill. The cables are inserted as quick as a flash through elastic opened brackets and can be pulled out again by hand in the same way. After the cables have been inserted, the overlapping brackets automatically return to their initial position. For users, this quick assembly and dismantling method means a real time saving, which in turn indirectly reduces costs. Changes in technical processes - such as changes in set-up location of handling units - can always be accommodated by Triflex R light.

### **Transparent process**

One decisive advantages of the new modular energy chain is that all the cables remain visible over their complete length, making regular inspection much easier. This is particularly important in the case of transparent hoses used to transport bolts, screws or similar consumables using compressed air. If jamming occurs, the spot affected can quickly be localised inside the hose.

### **Three cable compartments**

The three compartments inside Triflex R make it easy to separate electric, fluid and pneumatic supply lines. In addition, applications where supply lines are subjected to increased wear can be replaced at regular intervals. This could be on feed hoses for rivets, screws or bolts, for example - these could be guided separately, but within one compartment.

### **Suitable accessories**

igus has adapted the new energy supply system exactly to the accessories range of the larger robot chain model. Thus, for example, the connecting elements for Triflex R also fit the new light version (connection elements with integrated strain relief,

intermediate fastening devices), as does the heat protection hose (protects from welding and metal splashes up to 600° Celsius) as well as other components.

### **Could well be up for another industry prize**

Alongside fail-safe handling - no freely suspended electrical and pneumatic supply lines - optics also play an important role in energy guidance these days. Triflex R was awarded the iF Design Award 2004, for example (with igus having won more than ten such awards already). The new Triflex R light could well mean a further industry prize is in the pipeline for igus.



**Picture PM0705-02: igus GmbH, Cologne**  
The new highly flexible 3D energy guiding system Triflex R light (igus) doesn't need any additional reinforcements such as continuous steel or bearing ropes.



**Picture PM0705-05: igus GmbH, Cologne**  
Harald Nehring, authorized manager for energy chain systems at igus: "Hose mobility, stability of the chain, defined bending freedom."



**Picture PM0705-03: igus GmbH, Cologne**  
Triflex R light: high tension resistance thanks to trailer principle



**Picture PM0705-04: igus GmbH, Cologne**  
Little assembly and dismantling work mean real time saving.

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