

Factor-1 sensors for quicker and more flexible mounting

As field specialist for the processing and food packaging industries, Turck has built its reputation on reliability and diagnostic performance

Inductive sensors are as common in factory automation systems today as rice in risotto. The market is currently saturated with a diverse range of offers. Whoever sets out to convince the user of the superiority of their products must be intimately acquainted with their needs, providing appropriate solutions. The development of a company's product program is the guarantee that customers will continue to profit from innovations in such supposedly "simple" products as sensors.



Hans Turck GmbH & Co. KG

Witzlebenstr. 7
45472 Muelheim a.d. Ruhr
Germany

Phone +49 208 4952-0
Fax +49 208 4952-264
more@turck.com
www.turck.com

For over 30 years inductive sensors have been deployed for an increasing range of applications, providing solutions for the manifold problems encountered with mechanical switches. Thanks to their wear-free characteristics, they have now established themselves in the field of industrial automation. However, these applications gave rise to a series of further problems resulting from their limited temperature range, their sensitivity to magnetic fields and their dependence on the material to be detected (iron, stainless steel, copper, brass, aluminium).

Special sensor types had to be developed for these difficult applications, giving rise to a plethora of alternative sensors in addition to the original model. This resulted in expensive and complex stock keeping measures. What was needed was a universal sensor with a uniform reduction factor – hence the name Factor1 – and a greater switching distance, regardless of the material employed.

As early as 1993 the sensor specialist Turck succeeded in developing a solution for this problem: the uprox sensor with non-ferrite core and immunity to interfering magnetic fields. At the end of 2004, eleven years after the development of the first uprox sensor, Turck presented the "Plus +" version with integrated PCB coil. With the new sensor family uprox@+ the sensor specialist had succeeded in taking a further step towards their goal of a universal sensor.

Reducing costs and preventing errors

Since this time, the new generation of factor1 sensors have proved themselves in a multitude of practical applications, with users profiting from the superior technology in terms of reduced operating costs. A higher switching distance has made greater mechanical tolerance ranges acceptable, in turn influencing operational safety and therefore costs. In order to reliably prevent mechanical damage in the factory, all *uprox@+* flush sensors can also be recessed mounted. Here, greater tolerances also prove an advantage - without plant availability suffering.

Even construction faults due to the false planning of sensors can largely be avoided thanks to reduced free zones and the pre-damping protection, making mounting errors virtually impossible. This provides greater construction freedom when it comes to designing new machines and equipment. The whole range of applications can be covered by a small number of *uprox@+* sensors, simplifying procurement and warehousing. Ford in Europe for example was able to reduce the number of sensor types by 90% through the consistent deployment of *uprox@+* sensors – without having to make concessions in terms of performance. A further reduction of operating costs through quick and simple mounting was the aim when developing the Factor1 sensors. This has resulted in new construction and connection technology, complementing the *uprox@+* portfolio.

Simple mounting and removal

With the new QV40 sensor, a 40mm cubic construction type for rapid, tool-less mounting, is now available. The sensors can be secured into the holder with a simple click using just one hand, i.e. removed. The housing construction enables the active surface to be turned, again without the use of tools, so that the *uprox@+* sensor can be set in five different directions. Despite this flexibility the sensor remains firmly set in the chosen position.

For those applications requiring a large number of sensors – for example materials handling – the magnetic field resistant factor-1 sensors provide considerable reductions in terms of the time and cost of service and maintenance work. As the flexible mounting option enables the direction of each sensor in an installation to be individually adjusted, a protracted pre-planning process as well as the stockpiling of a range of different models and mounting tools is now no longer necessary. Corner LEDs with a high light intensity indicate the sensor's current switching status in every mounting context. With an integrated pre-damping protection, the sensor can also be semi-flush mounted.

Also for foreign countries and customs

A 2-wire DC version has also been added to the *uprox@+* portfolio. These sensors are of special interest for machine engineering companies that supply Japan, France and the USA where the 2-wire sensors are frequently employed. These sensors are also ideal for the quick replacement of mechanical switches in existing plant as the existing cable – as a rule two wires – can still be used. The first series of 2-wire DC sensors is available in the types M12, M18, M30 and CK40. If the sensors are operated with the Turck BL20 remote I/O field bus system, then wire breaks or short circuits can be detected immediately.

Food safe

The new *uprox@+* sensors guarantee high mounting flexibility with their integrated terminal chamber. This mounting form is most frequently deployed in the food industry. The sensors, available in the types M12, M18 and M30, both flush and non-flush, together with their terminal chambers, meet all the requirements for food safe material and are resistant to both cleaning agents and high pressure cleaning.

The cover of the compact, FDA compliant terminal chamber sensors from Turck can be simply turned to provide a straight or 90° angled cable outlet. The cable is inserted into the terminal chamber cover via a standard M16 screw connection. Removable screw or spring type terminals enable the cable to be quickly and flexibly mounted, i.e. pre-mounted on-site or in the workshop. In the event of a maintenance, the sensors can be replaced with a turn of the hand. LEDs in the terminal chamber provide the user with information on the switching status and the power supply.

The focus of all activities associated with the *uprox@+* sensors is the reduction of the process costs through rapid mounting, simple commissioning, optimised production processes, uncomplicated maintenance, a reduced number of sensor types as well as a longer product lifetime.

Author:

Silke Kenzer is a specialist for proximity sensors at the Hans Turck GmbH & Co. KG

Compact

Factor-1 sensors can be used to replace a range of different inductive sensor types within a factory, generating savings in terms of maintenance and inventory. Thanks to a new connection technology, *uprox@+* sensors can be simply and quickly mounted and removed. Special construction types complying with food industry guidelines are also available. Furthermore, Turck is the first supplier to include 2-wire DC sensors without a reduction factor in its program, a sensor type especially suited for users in Japan, France and the USA.