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Keep on running…

Heavy-duty switchgear at the POWTECH TECHNOPHARM

Switching devices assume various safety and monitoring tasks in conveyor systems

Belt misalignment, belt rips or danger to persons: bulk goods conveyor systems harbour multiple potential risks that users should be aware of. At the POWTECH, steute will be showing highly efficient solutions and beneficial innovations.

The conveyor belt keeps on running... and running... This is the ideal state in e.g. an extraction plant or industrial bulk goods processing, facilitated by a robust construction fit for purpose, as well as continual maintenance of the (belt) conveyor system. The switching devices installed along the conveyor belt also have a significant influence on occupational and machine safety, and many different "classic" designs and heavy-duty applications are available. At the POWTECH TECHNOPHARM, the steute business division Controltec will be presenting such devices on a demonstrator, as well as some new additions to its product range.

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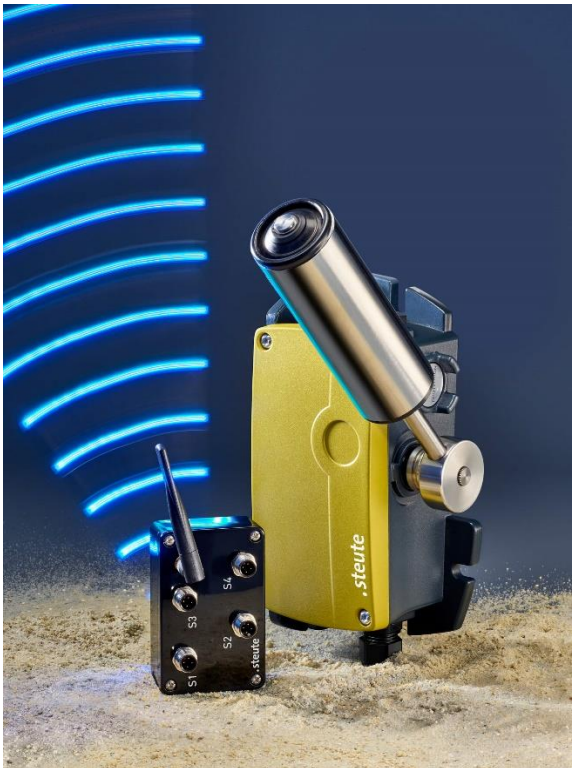
Extended emergency stop for conveyor belt safety

For heavy-duty applications: the ZS 92 S emergency pull-wire switch

A "classic" in this context is an emergency stop switch which enables workers to halt the belt safely (i.e. according to the requirements of the standards in the machine directive) in an emergency. The task is assumed by an emergency pull-wire switch, such as the ZS 92 S series developed specifically for extreme application fields, e.g. quarries, gravel works and pit mining. Just one look at the enclosure, and this is obvious: available alternatives are either a robust aluminium die-cast enclosure or an impact-resistant Thermoset enclosure. Despite the heavy-duty design, triggering of the emergency-stop function requires only a low actuation force and short travel. This makes the safety switch easier to operate, while still reliably complying with all relevant international standards (e.g. for emergency-stop switches, for emergency pull-wire switches and for continuous conveyor safety).



The ZS 92 SR belt alignment switch with RF I/O radio module

"One for all": flexible settings

One of the reasons why the ZS 92 S has become so well established in the marketplace is its flexibility: the emergency pull-wire switch is optionally available with different settings for both the actuation lever and the release lever. This means that it can be installed in nearly any position, including at the rear. The two integrated switch inserts are available in different contact variants, e.g. 2 NC/ 2 NO or 3 NC/ 1 NO.

The ZS 92 S is also suitable for adverse ambient conditions in temperatures ranging from -40 to +85 °C – with wire lengths of max. 2 x 100 m. Options include an LED indicator lamp, as well as the installation and connection of a safety input module for the "Dupline Safe" safety bus system from Gavazzi.

Dust Ex variants are also standard, and more compact yet equally robust emergency pull-wire switches are available for smaller conveyor systems and will also be shown at the POWTECH TECHNOPHARM.

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The new belt-rip detection system detects any rip in a conveyor belt early on, minimising subsequent damage

Belt misalignment: do not be caught off balance

Another very popular solution from the ZS 92 series, realisable on the same device platform, is the ZS 92 SR belt alignment switch. It has a roller lever which detects any misalignment of the belt, for example if it is loaded unevenly. In such cases, the switch triggers either a stop of the belt or – depending on how it has been set up – a warning notification enabling the belt alignment to be corrected. Operators can thus avoid complete belt standstills, which in the case of misalignment can be lengthy and work-intensive, especially if the belt has to be partially cleared before it can be started up again.

Detecting misalignment – and sending a notification remotely

In order to realise this function as conveniently as possible for users, steute has combined its ZS 92 SR belt alignment switch with an RF I/O radio module. This eliminates cabled signal transmission, which can be costly, especially when retrofitting or expanding a plant. The wireless protocol used is the tried-and-tested steute sWave®.

In concrete terms, this solution means that the standard belt alignment switch is connected to a separate RF/IO module. This transmitter unit passes on signals coming from the switch via sWave® to a wireless receiver – reliably, without cables, and over distances of up to 400 metres in the free field. Users can install additional repeaters for longer distances.

Two belt alignment switches can be connected to each RF/IO module. And each switch remotely transmits a two-step signal. The first signal can be e.g. a warning, while the second can trigger a standstill of the conveyor system. steute recently installed the first wireless belt alignment switch of this type at a gravel works in East Westphalia, where test operations to date have been completely unproblematic.

The separate RF I/O radio module makes even heavy-duty switches suitable for radio transmission

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The STM 515 solenoid interlock is available in a dust Ex version and an "Extreme" variant for use in adverse environmental conditions

Belt-rip detection for conveyor systems

A new addition to the product range. Besides misalignment, there is another potential problem with conveyor belts which should also be detected as soon as possible: a rip in the belt, caused for example by pointed or sharp metal within the transported bulk material.

A new belt-rip monitoring system, which steute will also be demonstrating at the fair, can detect a rip early on and bring the belt to a controlled halt.

A short wire is fixed below the conveyor belt and perpendicular to the direction of transport, its tension controlled by a compact ZS 71 pull-wire switch. If a foreign body or bulk item should penetrate the belt and cause it to rip, the wire is moved or pressed down, triggering the pull-wire switch. The switch sends a signal to the control system, which immediately stops the conveyor, preventing any further damage. A miniaturised safety breakaway coupling separates the switch from the wire system – preventing any damage to the switch itself.

Simple assembly on conveyor

This solution is optimally installed directly behind loading or transfer points and is easy to integrate in the existing conveyor system. Once a foreign body has been removed and, if necessary, the belt repaired, the user can reactivate the belt-rip detection by simply reconnecting the safety coupling and pressing the reset button, starting the belt moving again. This new monitoring system can also be

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mounted in tight spaces. Depending on the application conditions, monitoring is performed by a single system (with two wire deflections) or by two systems mounted in parallel (each with one wire deflection).

These robust switching devices from the steute "Extreme" range will be presented at the POWTECH TECHNOPHARM 2025 using a demonstrator conveyor belt. An additional demonstrator will show more sensitive switching devices especially geared to machine safety in machines and plants handling bulk goods. These models demonstrate different types of guard door monitoring, all additionally available in dust or gas Ex versions.

They include electromechanical safety switches and non-contact safety sensors. Ex solenoid interlocks, including the latest STM 515 series which is also available in an "Extreme" version for use in adverse environments, will also be presented at the POWTECH TECHNOPHARM 2025. The steute location is Hall 12, Booth 370.

steute is a medium-sized and international technology company based in Löhne, North Rhine-Westphalia. The company has around 450 employees and produces reliable switches and sensors to the highest quality standards.

steute Controltec products are chiefly specialised in the safeguarding, monitoring, control and automation of machines and plants in industry. Subsidiaries and sales partners look after customers in 40 countries worldwide.

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