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Eliminating cables has many advantages

New foot switch series for easy operation of press brakes, bending machines etc.

One movement of the foot: this is all that is required in order to start a casting or bending machine, or to perform a trial stroke with a press brake. Foot switches frequently represent a key element of the human-machine interface. Their appearance might have changed little, but they contain technical innovations providing considerable improved functionality and ergonomic comfort.

The problem was a frequent one, and the cause was obvious: again and again, a foundry had to replace the foot switches used to actuate its tilt casting machines. The reason was casting splashes which burned into the foot switch cables, leading to machine downtime or short-circuiting. The solution to this problem was simple: the foundry now uses foot switches from the steute "Wireless" range which have no cables to the machine or receiver (Fig. 1). Since this investment machine failures have become a thing of the past. This application example is actually non-typical, with the driving force behind the decision to swop from cabled to cable-free switches usually being ergonomic comfort. Wireless actuators can be positioned freely, without needing to take cables into account, and the operator is also not hindered by cables lying around on the floor (Fig. 2).

One of the groups of people enjoying the benefits of this technology are the operators of swing-folding machines made by a Swiss manufacturer.



Using wireless foot switches in foundries has the advantage that cables cannot be damaged by casting splashes

These machines can be optionally equipped with a steute Wireless foot switch which communicates with the receiver located inside the switch box via a safety-related wireless protocol. Sleep mode for a longer battery life.

Wireless protocol for safety-related applications

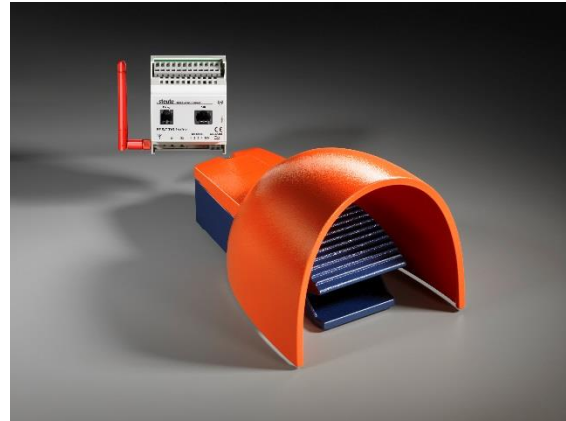
The foot switch uses the safe "sWave 2.4 Ghz -safe" wireless protocol developed especially by steute, based on the physical layer of the IEEE 802.15.1 standard. It is especially suitable for rough industrial environments due to its extreme reliability, guaranteed amongst other things by the adaptive FHSS ("Frequency Hopping Spread Spectrum") procedure across 79 channels, as well as its very good coexistence with other wireless systems. The overall transmitter/receiver system is designed – as should be expected with safety-related applications – to be fundamentally two-channel.

The foot switch and evaluation unit can be unambiguously assigned, enabling several safe foot switches to work in parallel within one radio range. This feature is used, for example, by the abovementioned manufacturer of swing-folding machines: with one of two wireless foot switches assuming operation of the machine as required. For long working areas this is a real improvement – not only because the distance to the foot switch is shorter, but also because the operator has a better view of the (folding) process at all times.

Advantageous in heavy-duty applications

In heavy-duty applications, wireless foot switches offer particular benefits because there are no cables which can become damaged. This is an important factor, in

addition to ergonomic comfort, in environments such as foundries, steelworks or sheet metalworking companies.



Wireless foot switches transmit signals to a receiver unit without any need for cables

The foot switches are powered by battery, facilitating a highly available bidirectional wireless connection. The overall system, comprising the wireless foot switch and the receiver unit, is EC type-examination tested and achieves Performance Level (PL) d according to ISO EN 13849-1, as well as Safety Integrated Level (SIL) 2 according to IEC 62061.

Variant: compliant enabling switch for press brakes

Operators of press brakes can benefit from the advantages of these wireless foot switches in set-up mode or when restarting the machine. For this type of application, foot switches known as enabling switches are used. They have special switching inserts and are described in the DIN EN 60947-5-8 standard. These switches feature a three-stage operation. In the middle position the enabling function is activated. Yet as soon as the operator moves the enabling switch to one of the two

end positions, by pressing the pedal further or releasing it completely, an immediate stop of the machine or dangerous movement is triggered. This guarantees that the enabling function is only active when the operator consciously actuates it, as is the case e.g. during set-up or when performing trial strokes after the machine has been restarted. steute developed its GFS VD series especially for this application, now also available – as one or two-pedal versions – in a "Wireless" variant. This series meets all the relevant standards, including DIN EN 60947-5-8 and DIN EN 12622. It also has the DGUV approval. The contact system in the foot switch facilitates particularly soft switching and prevents the machine from jerking, e.g. when the switch is released from its furthest switching position.

Further development: additional signal after safe switch-off

steute is currently developing its third generation of Wireless enabling foot switches. This generation will use a new wireless protocol based on Bluetooth LE. After the pedal pressure point has been reached, not only will a safe switch-off of the press brake be triggered, in addition the foot switch will then send a message to the machine control containing the

information that the stop function has been actuated. This facilitates a reset. Of course, such (wireless) foot switches can be used not only with press brakes, but also for example with tooling machines and other types of machine operated in special modes such as "set-up" or "process monitoring". The machines can then be operated compliantly with open guard doors and reduced speed, as long as the user actuates the foot pedal and keeps it pressed in the middle position. This is true of the "normal" cabled foot or enabling switches, as well as the new wireless foot switches.

Robust construction, non-tiring actuation

Independently of the type of signal transmission and the function or application, the steute foot switches feature a low pedal height. This is an important prerequisite for easy and non-tiring actuation. They are also extremely stable, which in this kind of switching device is crucial for ergonomic and intuitive operation. The metal housing can withstand high levels of mechanical wear and tear, meaning that the foot switches are extremely durable, even in heavy-duty environments

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