

## Technical Article – Conveyor Emergency Safety Switches

Emergency Stop switches go hand in hand with conveyor systems like bread and butter. The safety of personnel is dependent on the implementation of adequate safety switches. These safety switches consist of Pull Wire and Belt Drift Switches.

### How to select the ideal Pull-wire Switch for a conveyor application?

Selecting a Pull wire or Belt Alignment Switch is dependent on several factors:

**Environment** – Conveyors can be located anywhere in the world and as such, choosing the correct switch for the required operating conditions is essential. IP ratings for water and dust ingress affect under which climatic and dusty conditions an Emergency safety switch can reliably operate under. Indoor operated conveyors would need a lower IP rating as they are not exposed to the elements. In hazardous areas where there is risk of explosions or fires, the enclosure material is critical. Ex rated switches can be used for environments with high-risk hazardous gases (Zone 1) and high-risk hazardous dust (Zone 21).

**Length of Conveyor** – The length of the conveyor plays a part in determining the distance each Pull wire switch can cover based on the maximum Pull wire length and the number of Belt Drift switches. Australian/New Zealand standards stipulate the number of switches required as well as the maximum pull wire lengths permitted.

### Pull Wire Switches

Why are Pull Wire Switches installed on Conveyors?

Safety is critical in the operation and maintenance of conveyors and as such, emergency switches provide a layer of protection against injury and equipment damage. Pull Wire Switches have mechanical actuators that are activated via the pulling action of the Pull wire. Snap action contacts cut off power supply thereby immediately stopping the conveyor. This immediate action is vital to prevent physical harm to individuals in close proximity to the conveyor during operation as well as reduce the risk of machinery damage. Pull Wire switches come in 2 main formats, Dual and Single sided.



Figure 1: Steute Dual sided activation Pull Wire Switch

#### Dual Sided

Dual sided activation Pull wire switches allow the central mounting of the switches, covering bigger distances compared to a single sided actuated Pull wire Switch that is used for shorter conveyors.

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Figure 2: Steute Single sided activation Pull Wire Switch

### Single Sided

Single sided activation Pull wire switches are mounted towards the end of each side of the conveyor with a pull wire termination point on each opposing end. This type of switch is mainly used on short conveyors due to the shorter rated maximum pull wire length.

### Belt Drift Switches

Why are Belt Drift Switches a standard feature on conveyors?

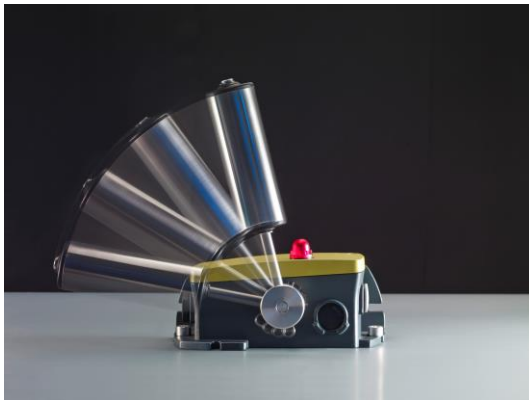


Figure 3: Steute Belt Alignment Switch

Belt mis-tracking is inevitable in conveyor operation. Preventative measures are recommended to be put in place to eliminate the risk of equipment damage due to conveyor belts running off track.

Belt Alignment Switches are a 2-stage switch that consists of adjustable **alarm warning** activation and conveyor **shut down** contacts. This provides a flexible working range to warn operator when a belt is out of alignment and to shut down the conveyor if the belt strays past the emergency stop activation point.

### How are they installed?

Emergency Safety Pull-wire switches have several tensioning accessories that ensure the relevant local and international standards are fulfilled. In the case of Australian/New Zealand conveyor Safety Standards, AS/NZ 4024.3610:2015-2.10.6.2, the Pull-Wire Switches must adhere to the 70N maximum Pull force enacted on the Pull wire at a maximum axial distance of 300mm requirement. Pull wire switches are mounted horizontally to enable the pulling of the Pull wire along the length of the conveyor. Belt drift switches however can be mounted vertically or horizontally due to the adjustability of the roller arm. Wiring of the switches follows the Electrical standards of allowing the flow of power under normal operation and the cutting of power to the conveyor motor when switch is activated. The number of NC/NO contacts dictates redundancy possibilities as well as how the switch can be wired for monitoring via a PLC system.

### Summary

Safety is an important aspect of conveyor operation that requires the following of the relevant conveyor safety standards. The selection and installation of emergency safety switches must be adequate for the conveyor design to ensure the correct operation of conveyor systems and prevent human injury and machinery damage.