

LIMIT SWITCHES IN CONVEYOR APPLICATIONS

Application Note

Limit switches are used to provide conveyor system monitoring and control as well as safety in case of a problem. A limit switch is a precision snap-action switch that has been encased to protect it from external forces, such as hazardous chemicals, water, oil and dirt, and is used to detect presence or absence in areas where physical contact is allowed.

BACKGROUND

A belt conveyor usually consists of two or more pulleys, with a continuous loop of material (belt) that rotates about them. One or both of the pulleys are powered, moving the belt and the material on the belt forward. There are two main industrial classes of belt conveyors: general material handling (moving boxes along inside a factory) and bulk material handling (transporting industrial/ agricultural materials).

SOLUTIONS

In the conveyor belt application shown in Figure 1, a variety of limit switches can be used.

Often used on conveyors designed for use in harsh indoor and outdoor environments, **heavy-duty limit**

switches can reliably indicate position for system controls. In this configuration, the limit switch could be used to count the items flowing through it. It could also be used to ensure that materials are correctly positioned and will sound an alarm or stop the belt if there is a problem.

Cable-pull limit switches are emergency stop switches that control access around the conveyor perimeter or provide emergency-stop cable-pulls along the conveyor. These kinds of limit switches provide a highly reliable, highly visible, safe-to-use rope-pull device to protect operators working near conveying systems.

Hazardous location switches are very similar to heavy-duty limit switches but are housed in sealed enclosures to

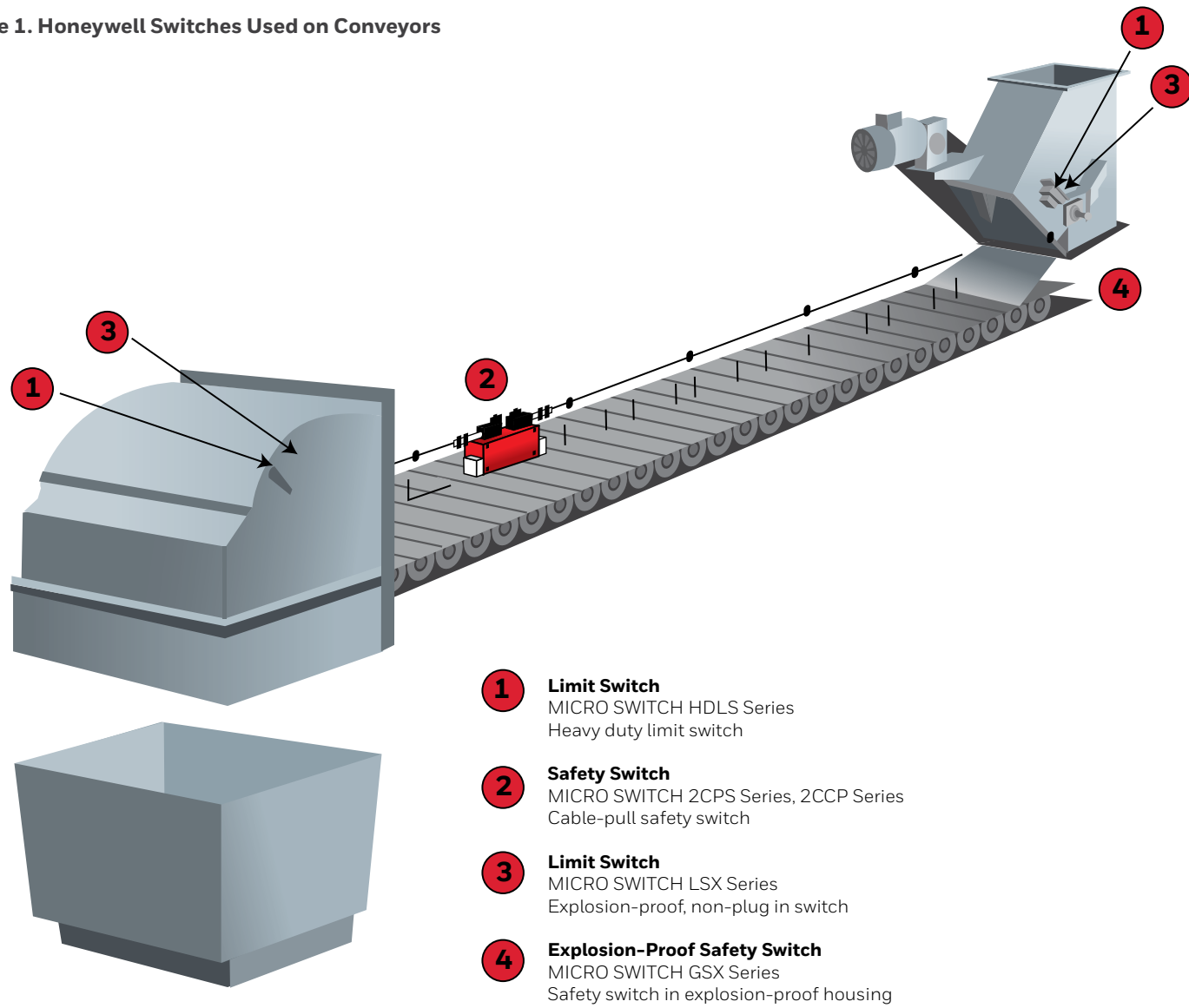
LIMITS FOR CONVEYOR APPLICATIONS



One of the broadest and deepest limit switch portfolios available. Honeywell MICRO SWITCH limit switches are rugged, dependable position detection solutions.

Honeywell

Figure 1. Honeywell Switches Used on Conveyors



- 1 Limit Switch**
MICRO SWITCH HDLS Series
Heavy duty limit switch
- 2 Safety Switch**
MICRO SWITCH 2CPS Series, 2CCP Series
Cable-pull safety switch
- 3 Limit Switch**
MICRO SWITCH LSX Series
Explosion-proof, non-plug in switch
- 4 Explosion-Proof Safety Switch**
MICRO SWITCH GSX Series
Safety switch in explosion-proof housing

prevent a spark or electrical discharge from setting off an explosion. They are often used for door or diverter position detection in outdoor, above-ground, potentially explosive environments, such as grain handling and oil and gas applications.

Safety and hazardous location switches have also been designed with an explosion-proof housing. Often used in outdoor, above-ground, potentially explosive environments, such as grain handling conveyors, or oil and gas applications, hazardous location switches can quickly and reliably stop system operation when the switch is triggered by the operator.

Limit switches can also be used in other ways on conveyor belts. For example, a limit switch alongside the belt could ensure that packages and materials are correctly positioned on the conveyor belt. The limit switch signal connects to a controller that will stop the belt if there is a problem.





To prevent jamming the belt's discharge, limit switches could measure the number or height of the products on the conveyor belt. If too much product is going down the belt, the system will shut down before damage or spillage occurs.

Honeywell manufactures many MICRO SWITCH switches that may be used in conveyor applications. They are designed to help control position, flow, and machine safety.

Honeywell offers an advanced line of heavy-duty limit switches and a wide selection of application-proven enclosed switches. Products meet or exceed critical standards allowing for global use. Honeywell solutions for machine guarding applications include operator point-of-operation protection, access detection, presence sensing, gate monitoring, and electrical interfacing. Series includes safety interlock, limit, cable pull, and noncontact switches. Honeywell MICRO SWITCH safety switches are high-quality, dependable, and cost-effective solutions for safety hardguarding and perimeter emergency stop applications. Most are SIL 3 capable.

Table 1. Honeywell MICRO SWITCH Limit Switch Series for Conveyor Applications

THIS APPLICATION NOTE CONTAINS CLICKABLE LINKS...
To review the datasheet for a particular series of limit switches with positive-opening contacts, click on the Series name below.

| Heavy-Duty Limit Switches | |
|--|--|
|  | HDLS Series, metal housing |
| Hazardous Location Limit Switches | |
|  | LSX Series, metal housing, explosion-proof, non-plug-in |
| Hazardous Location Safety Switch Series | |
|  | GSX Series, hazardous location switch with metal housing |
| Cable- and Rope Pull Switches | |
|  | 2CCP Series, designed dual-head cable/rope pull with metal housing 1CPS Series, single head cable/rope pull with metal housing 2CPS Series, dual head cable/rope pull with metal housing |

MICRO SWITCH explosion-proof switches are the industry standard for hazardous applications. Available in a variety of styles, MICRO SWITCH hazardous location switches feature UL, CSA, ATEX, and IEC Ex certifications. Offered with a variety of heads and non-sparking actuators, Honeywell's hazardous location switch product line includes smaller sizes, lower-cost options, and analog outputs.



⚠️ WARNING IMPROPER INSTALLATION

- Consult with local safety agencies and their requirements when designing a machine control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

FOR MORE INFORMATION

Honeywell Advanced Sensing Technologies services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit sps.honeywell.com/ast or call:

| | |
|---------------|---------------------|
| USA/Canada | +302 613 4491 |
| Latin America | +1 305 805 8188 |
| Europe | +44 1344 238258 |
| Japan | +81 (0) 3-6730-7152 |
| Singapore | +65 6355 2828 |
| Greater China | +86 4006396841 |

Honeywell Advanced Sensing Technologies

830 East Arapaho Road
Richardson, TX 75081
sps.honeywell.com/ast