

MATERIAL HANDLING / OVERHEAD CRANES

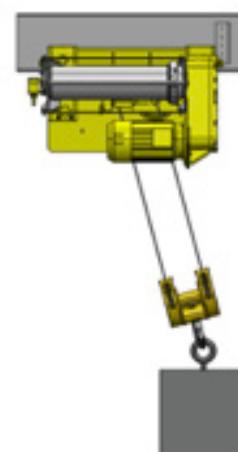
Hoist Side Pull Detection with Tilt Sensors

APPLICATION

A two axis MEMS based tilt sensor is mounted on a bracket clamped to the dead end of the wire rope on the hoist near the frame to detect side pulling.

SUMMARY

Usage of hoists for lifting loads in industrial applications has inherent risk, requiring the need for safety precautions. If a load is not lifted directly vertical and is permitted to side load a hoist, damage to the hoist, injury to personnel, and/or damage to nearby equipment can result. This is referred to as "side pulling" a hoist. Detection of potential side pull conditions can be tied into hoist controls to not permit a lift under this condition.



USE CASE

Safety Regulations & Damage Control

When a large load, such as a stamping die, injection mold, or a container is not lifted with the hoist centered, the risk of injury or damage increases. Side pulling a hoist is not permitted by OSHA regulations under most conditions.

Many hoists installed in industry do not have any form of side pull protection installed.

Side pulling a hoist can result in:

- ④ Damage to hoist if it is not engineered to handle the side pull load; The result can be physical damage to the hoist or can be as dangerous as snapping a wire rope on the hoist
- ④ Personnel injury if the load shifts once it is lifted from its resting place on the floor or a staging fixture
- ④ Damage to nearby equipment once the load shifts after it is lifted

SOLUTION

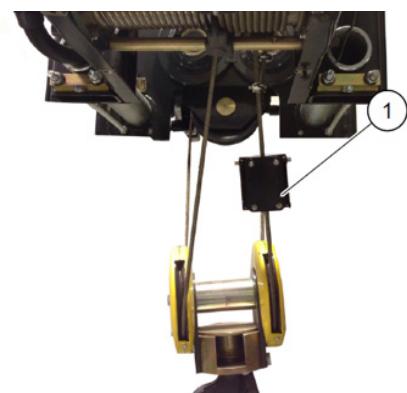
LaserView Technologies can provide a solution by applying DIS MEMS based tilt sensors to a hoist.

DIS tilt sensors are unique in the industrial market because they provide user-adjustable functionality:

- ⌚ User settable limits in each axis
- ⌚ Hysteresis
- ⌚ Time delay
- ⌚ Filtering to deal with vibrations common to a hoist
- ⌚ Zero or centering function
- ⌚ SIL1 safety rated versions available
- ⌚ MEMS based device means no moving parts
- ⌚ Each sensor is fully potted, rated IP67, IP68, or IP69K sealed, shock rated and typically operates in ranges from -40C to +85C temperatures



Properly equipping a hoist with a DIS tilt sensor adds another layer of accident prevention. The sensor's parameters can be configured by the end user during installation to suit the operating conditions.



We recommend our 2 axis tilt switch or our 2 axis omni directional tilt switch.

In some cases, the tilt sensor can be applied to an under hook lifting device, such as a spreader bar.

As a more generic solution, DIS tilt sensors can be mounted on an angle plate clamped to the dead end of the wire rope near the hoist frame.

The 2 axis tilt switch provides 2 distinct axis, dependent on gravity. The omnidirectional tilt switch detects an inclination in any combine vector of x or y axis, making it better suited as a general solution to detect side pulling in any combination of directions (X/Y planes).