Veris Application Note

VN28

Reduce Conveyer Sensor Count with Current Monitoring Techniques

⚠ DANGER ⚠

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Follow safe electrical work practices. See NFPA 70E in the USA, or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Read, understand and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Use a properly rated voltage sensing device to confirm power is off. DO NOT DEPEND ON THIS PRODUCT FOR VOLTAGE INDICATION
- Only install this product on insulated conductors.

Failure to follow these instructions will result in death or serious injury.

The information provided herein is intended to supplement the knowledge required of an electrician trained in high voltage installations. There is no intent to foresee all possible variables in individual situations, nor to provide all training needed to perform these tasks. The installer is ultimately responsible to assure that a particular installation will be and remain safe and operable under the specific conditions encountered.

Introduction

In a typical conveyor installation product flow is usually controlled by a series of externally mounted sensors (photo-electric, infrared, laser, etc.) that are used to detect position, volume, and speed of the process. It is possible to reduce the number of sensors needed by paying attention to the drive motor current and its relation to the workload.

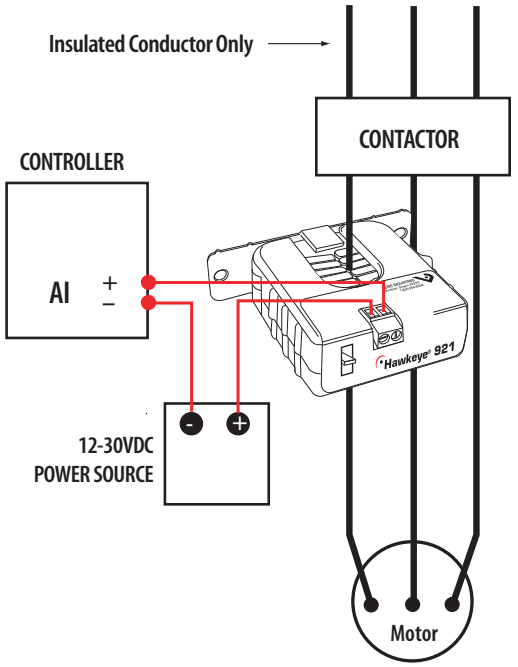
In any conveyor installation, the heavier the load, the more power required from the motor. By monitoring the amount of current the motor is drawing, it is possible to determine if the system is running as expected. If the amount of current used increases dramatically, the system is probably jammed. A quick drop in current indicates a probable belt break or pin shear. The easiest way to monitor motor power is to use a current transducer.

Advantages of using current sensors include:

- Reduced installation costs – no calibration fixtures or exposed location
- Fast response increases motor life
- No moving parts means long life
- Easy maintenance -no exposure to washdown – does not have to be installed in open
- Ease of operation – set and forget

Current Transducer

The simplest example of a current transducer is one that simply outputs a signal that is directly related to the current draw of the motor. This style of transducer is used with a controller, and it functions as an alarm. Upper and lower current limits are programmed in the controller along with the appropriate motor control functions (see example 1).



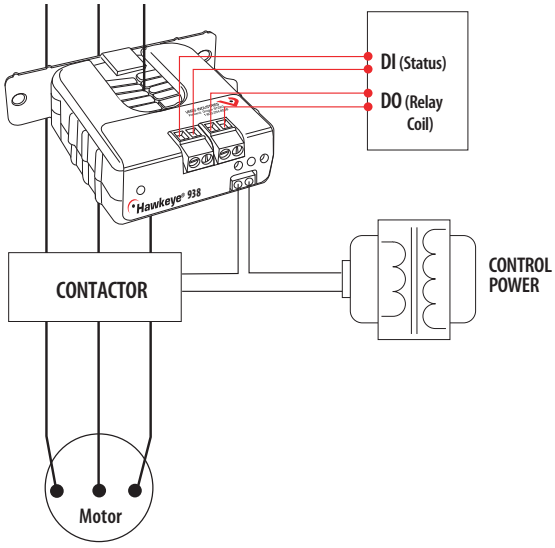
example 1

Current Switches

A versatile type of current transducer is the current switch. In many installations, interface to a controller is not required, so these sensors can be used on stand-alone conveyors. This type of transducer is preset with a specific current threshold (trip point) at the time of installation. A single model may be set for either over- or under-current monitoring. When the trip point is reached, the transducer sends a signal to the controller.

Low under-current monitors are especially useful in detecting belt breakage or shear pin loss. These problems are quickly detected and the system can be shut down immediately, preventing further damage. The split-core models make retrofitting to existing systems easy, while solid-core housings are the most economical option it installation will occur at the time of construction. Some transducers are also self-powered. This type of product can also include an integral relay for simple motor control (see example 2).

example 2



Over-current monitors are used to protect the motor and gearbox from damage due to jams or bearing failure. Although not designed to replace circuit breakers or thermal fuses, a current switch can detect an increase in load very quickly. This fast response can save a motor as well as significantly reducing damage from a jam. Installation is simple and can be easily retrofitted to any conveyor system (see example 3).

example 3