

Fan and Pump Status Monitoring using Current Switches

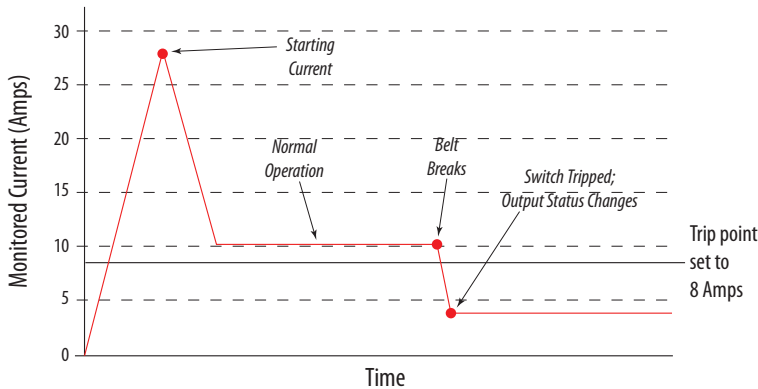
Theory of Current Sensor Operation

In a constant volume fan or pump motor, most of the energy consumed is used to move the air or liquid, with less energy (typically 40% or less) used to turn the motor itself. To detect the difference between the current draw on an unloaded motor and one that has a load (i.e., is moving air or liquid), use a current switch.

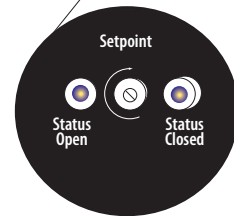
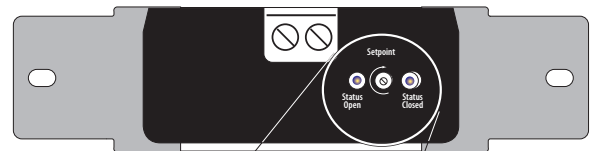
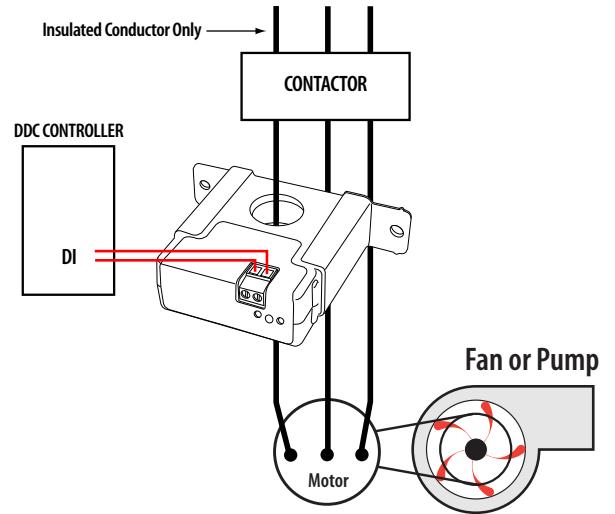
Install the current switch on one phase of a multi-phase motor. The current switch monitors whether current is flowing through that conductor, indicating that the motor is moving air and doing work. If there is a failure to move air, such as a mechanical problem in the motor, the current switch detects the occurrence. A change in the amperage that crosses the switch threshold (trip point) plus the hysteresis value causes the resistance of the FET status output to change state, similar to the action of a mechanical switch. With an adjustable threshold, the current switch provides different status outputs when the motor is loaded and unloaded, providing positive proof of flow.

Current switches can also save time and money by eliminating the need for air flow measurement devices and air tubing runs.

The graph below illustrates an example of a current switch with a trip point set to 8 A and how the switch works when monitoring amperage in a conductor.



For more information about using current monitoring in fan and motor applications, see Veris Application Notes VN04, VN05, VN06, VN07, and VN29.



LEDs make the three-step calibration process easy. Once calibrated, the current switch trip point is set to just under normal operating amperage, and the contact opens upon mechanical failures such as belt loss and coupling shear.

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 training needed to perform these tasks. The installer is ultimately responsible for ensuring that a particular installation remains safe and operable under the specific conditions encountered.