PROTECTING AXIAL FAN HVAC SYSTEMS INCLUDING COOLING TOWERS

IMI SENSORS
A PCB DIVISION

pcb.com/imi-sensors | 1 800 959 4464

VIBRATION SWITCHES

Most mechanical and evaporative heat rejection equipment in an HVAC (including cooling towers and air cooled chillers/ heat exchangers/condensors) system has an induced-draft configuration typically including one or more axial fans mounted at the top of a steel structure. The fans move outdoor air through the equipment in order to expedite the heat transfer process. Because axial fans are large-diameter propeller fans with long blades, their stable performance is easily influenced by mechanical or environmental imbalance, damaged or worn gears and damaged shaft/coupling. When not at a stable operating level, the fans tend to vibrate at increased amplitude. Vibration monitoring is essential to provide signals for early warning or provide shutdown when vibration levels exceed a predetermined threshold.

LINEAR ADJUST MECHANICAL VIBRATION SWITCH

SERIES 685AX9

- Patented, spring-loaded, magnetically coupled mechanism
- Cost-effective protection for less critical applications
- Manual and remote reset options available

CE

ELECTRONIC VIBRATION SWITCH

SERIES 685B

- On-board or remote piezoelectric accelerometer
- Two separate relays plus 4-20 mA & raw vibration outputs
- Hazardous area approved options available

CE

MECHANICAL VIBRATION SWITCH

MODEL 685A08

- CSA-approved for use in hazardous areas
- IP66 rated enclosure
- Requires no power

CE

USB PROGRAMMABLE SMART SWITCH

SERIES 686

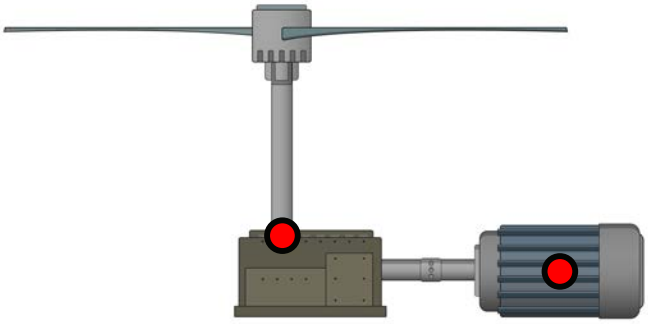
- Piezoelectric sensing element with field-adustable threshold settings
- Programmable delays eliminate false trips
- Hazardous area approved options

TYPICAL SENSOR PLACEMENT

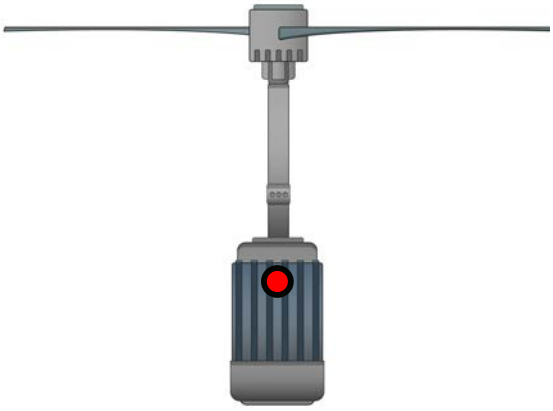
SWITCH SELECTION AND PLACEMENT IS DEPENDENT UPON SEVERAL DIFFERENT FACTORS:

- Industry Standards: Cooling towers in compliance with the Cooling Technology Institute's Standard 163 (Standard for Vibration Limits in Water Cooling Towers) must monitor vibration in velocity. Only IMI Sensors' electronic and USB programmable smart switches can meet the requirements of the standard.
- Environment: Switches installed in a potentially explosive atmosphere will need to be hazardous area approved, indicating they operate with low currents and voltages in order to prevent the provision of a source of explosion ignition.
- Axial Fan(s) Configuration: The goal of ideal switch placement is to locate the switch as close to the source of vibration as possible. The axial fan/motor configuration will dictate switch placement as well as the number of switches required for adequate protection. The axial fan / motor configuration may consist of a belt-driven fan, gearbox-driven fan or direct-driven fan. On HVAC equipment with more than one axial fan/motor assembly, switch(es) should be installed on each assembly.

BELT-DRIVEN FAN



GEARBOX-DRIVEN FAN



DIRECT-DRIVEN FAN

Sensor Placement

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IMI Sensors offers a wide range of industrial vibration sensors, bearing fault detectors, mechanical vibration switches, panel meters, cables, and accessories for predictive maintenance and equipment protection. For power generation and energy applications requiring precision measurements, IMI also offers pressure sensors and accelerometers.

IMI-APP-CoolingTowers-1121