PROTECTING AXIAL FAN HVAC SYSTEMS INCLUDING COOLING TOWERS
Most mechanical and evaporative heat rejection equipment in an HVAC (including cooling towers and air cooled chillers/heat exchangers/condensers) 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.

**VIBRATION SWITCHES**

**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

**MECHANICAL VIBRATION SWITCH**  
**MODEL 685A08**  
- CSA-approved for use in hazardous areas  
- IP66 rated enclosure  
- Requires no power

**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

**USB PROGRAMMABLE SMART SWITCH**  
**SERIES 686**  
- Piezoelectric sensing element with field-adjustable 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.
MTS Sensors, a division of MTS Systems Corporation (NASDAQ: MTSC), vastly expanded its range of products and solutions after MTS acquired PCB Piezotronics, Inc. in July, 2016. PCB Piezotronics, Inc. is a wholly owned subsidiary of MTS Systems Corporation. Additional information on MTS can be found at www.mts.com.

IMI Sensors, a division of PCB Piezotronics, Inc. manufactures industrial vibration monitoring instrumentation, such as accelerometers, vibration transmitters and switches that feature rugged stainless steel housings and survive in harsh environments like paper and steel mills, mines, gas turbines, water treatment facilities and power plants. Integrating with portable analyzers and PLC’s, IMI instrumentation helps maintenance departments reduce downtime and protect critical machinery. Visit IMI Sensors at www.pcb.com. PCB Piezotronics, Inc. is a wholly owned subsidiary of MTS Systems Corporation. Additional information on MTS can be found at www.mts.com.

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