Should a fan or blower in a cooling or ventilating application fail, the results can be disastrous. In computer and telecommunication equipment, failure of an air mover may cause operational failure or even permanent damage. In ventilating applications contaminants may build to dangerous levels, equipment may fail or livestock may perish. There are at least four effective methods of detecting air mover failure.

Tach Alarms

Air mover speed is sensed using pulses generated by a Hall Effect device installed in the fan. Below a predetermined speed, an alarm is triggered. This method is very reliable, however it requires a special fan with a Hall Effect connection. Because the Hall Effect device is part of any brushless DC fan, the output adds little to cost, however, this feature may add significant cost to an AC fan and may not be available on some.

TachScan-9, page 36, senses tach pulses from up to nine fans and provides pass/fail signals. Three trigger speeds are selectable by jumper. Outputs can drive LEDs, logic, optical isolators or MOS relays.

TachScan-3, page 40, senses tach pulses from up to three AC or DC fans. It provides normally closed (NC) and normally open (NO) optically isolated alarm outputs as well as current limited outputs for driving red and green LEDs.

TachStrip, page 43, uses a modular breakaway design for use with up to six AC or DC fans. Trigger speed is adjustable using a jumper. Each unit provides separate NC and NO outputs in addition to an OR'd output if any fan connected to the TachStrip should fail. All outputs are referenced to the negative terminal of the fan.

Current Alarms

The electrical current delivered to an air mover is a good indicator of performance. It is easily monitored for AC as well as DC fans and requires no special fan features. It is inexpensive and because most failures will result in abnormal current, quite reliable. Both high and low current limits can be set, but usually only a low limit is necessary.

AmpStrip-AC, page 46, is available in individual units or in breakaway strips of 3 units for applications where more than one AC air mover is used. The trigger current is adjustable using a jumper on the board. For driving logic circuits, individual optically isolated outputs are provided. For driving LEDs or piezo alarms, nominal 12 mA individual and OR'd outputs are provided.

AmpStrip-DC, page 48, uses a modular breakaway design for use with up to six DC Fans. AmpStrip-DC has factory set trigger currents of either 0.05 Amps or 0.30 Amps. Each unit provides separate NC and NO outputs in addition to an OR'd output if any fan connected to the AmpStrip should fail. All outputs are referenced to the negative terminal of the fan and can drive logic, an LED or a piezo alarm.

Temperature Alarms

Measuring air or surface temperature is fundamental. In combination with speed control it adds little cost because the sensor used to control speed can also provide a signal to the alarm circuitry. A temperature alarm will of course, also respond to failures other than the air mover. For example, operation of equipment at excessive ambient temperature or a clogged air filter will also trigger the alarm.

HotSpot-Z, page 50, is compatible with all SmartFan sensors except P10 shown on page 34. Trigger temperature is adjustable to 45°, 50° or 55°C using a jumper on the board. HotSpot-Z can be used with supply voltages from 5 to 25 VDC and it supplies current to drive LEDs and piezo alarms. It can also drive logic circuits from either NO and NC grounded outputs or from an NC optically isolated output.