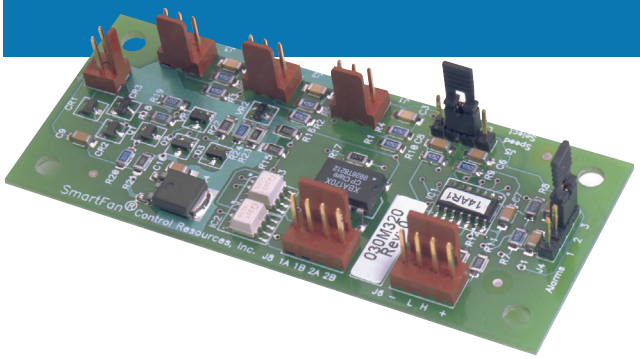
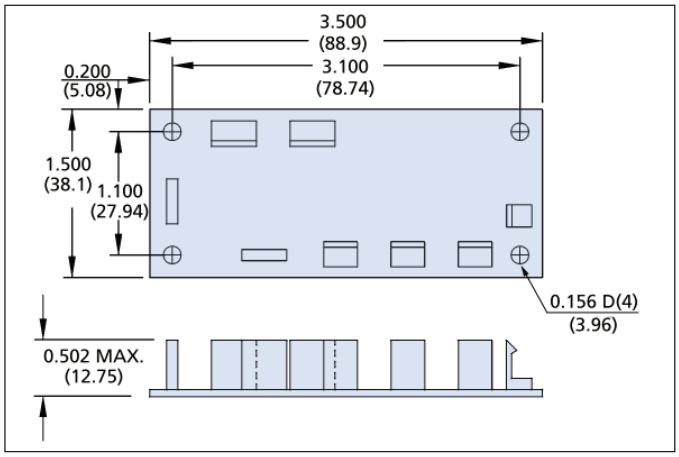
SmartFan® *TachScan-3 — Fan speed alarm*



SmartFan TachScan-3 is a digital fan speed alarm that monitors the tach pulses from up to three DC or AC fans or blowers and provides OR'd pass/fail signals. TachScan-3 is compatible with any fan that provides open collector or voltage source tach pulses. Three trigger speeds are selectable by jumper. If the speed of any air mover falls below the trigger speed, alarm signals are generated. Alarm signals can drive LEDs, logic, optical isolators or MOS Relays.



FEATURES

- **Accepts any supply voltage from 6 to 60 VDC and distributes power to DC fans through the same header used to sense tach pulses. It can also be used to power the DC tach circuits built into AC fans.**
- **Three inputs monitor fans with any open collector or voltage source tach pulses.**
- **P/N 030M320 provides simultaneous NO and NC open collector outputs from optical isolators which can sink up to 1.0 mA to drive logic circuits.**
- **P/N 030M320R provides simultaneous NO and NC isolated outputs from a Dual-Pole MOS Relay which can sink up to 100 mA to drive heavy loads.**
- **Jumper sets trigger speed to 1,000, 2,000 or 4,000 PPM.**
- **Can drive two single LEDs or one bi-colored LED.**
- **Compatible with any SmartFan speed controller.**
- **Small size of 3.5" X 1.5" permits mounting in small spaces within fan trays, etc.**

SPECIFICATIONS

Part Number	Isolated Alarm Sinking Current	Supply Voltage Range	Maximum Input Current	Maximum Output Current to Any Fan
030M320 030M320R	1 mA 100 mA	6 to 60 VDC	2.50 Amps	2.50 Amps
H115	Hardware Pack			

Note: Maximum operating temperature is 65°C

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INSTALLATION

Fan Connections

For three wire DC fans operating at supply voltages between 6.0 and 60.0 VDC, TachScan-3 distributes power to the fans in addition to accepting tachometer pulses from the fans. Connect the fan wires to J1, J2 and J3 using the suggested hardware, or equivalent. For applications using less than three fans, any of the three connectors (J1, J2, J3) can be used to monitor tachometer signals. The fan wires are usually color coded with red for +, black for - and white or yellow for A (alarm). Input current must not exceed 2.5 Amps.

AC Fan Alarm Monitoring

TachScan-3 cannot distribute AC power to AC fans. AC fans usually have 5 wires, 2 for power and 3 for the tachometer pulse circuit. Connect the AC fan power leads to the rated source of power. Connect the tachometer pulse leads (+, -, tach pulse) to J1, J2, and J3. TachScan-3 distributes power to run the tachometer pulse circuits within the fans. Apply a DC voltage at J7 as specified by the fan manufacturer for the tachometer pulse circuits.

Use with a SmartFan Speed Controller

Because of the wide range of power supply voltages that may be connected to J7, TachScan-3 may be used with any DC SmartFan speed controller. The power output of the speed controller that would otherwise be connected directly to the fan load is instead connected to J7 (See figure 2). TachScan-3 in turn distributes this power to the fans.

Connections/Jumpers

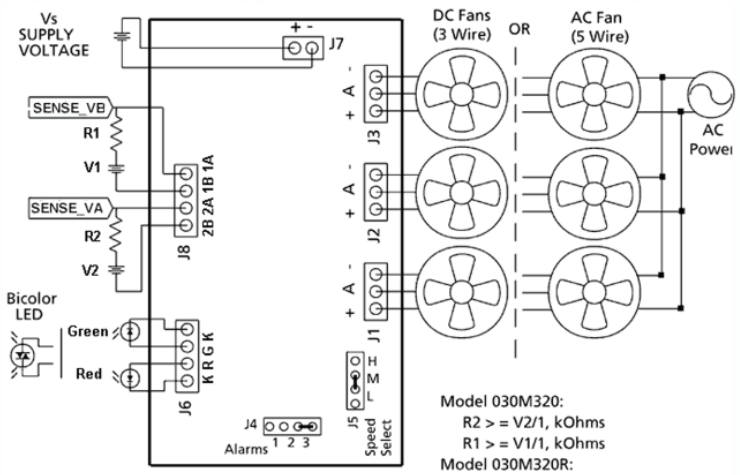

Figure 1
Typical Wiring Diagram

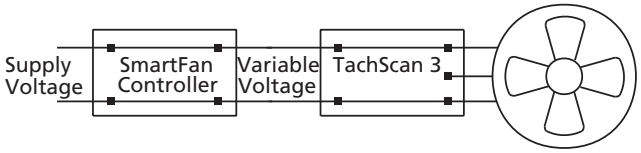

Figure 2
Multi-board configuration for variable fan speed control and tachometer alarm monitoring.

Suggested Connecting Hardware

Ref. Desc.	Header on Board[1]	H115 Hardware Pack			
		Quantity	Description	Manufacturer[1]	Part Number[1]
J1, J2	22-29-2031	3	Housing	Molex	22-01-3037
J3		9	Terminal (gold)	Molex	08-55-0102
J6, J8	22-29-2041	2	Housing	Molex	22-01-3047
		8	Terminal (gold)	Molex	08-55-0102
J7	22-29-2021	1	Housing	Molex	22-01-2027
		2	Terminal (gold)	Molex	08-55-0102
		4	PCB Support	Richco	CBS-4-19

[1]or equivalent

OPERATION

Settings (J4)

Alarm Channel Setting: Use this jumper to specify the number of fan tachometer signals that will be monitored, from 1 to 3. Each jumper setting label corresponds to the number of fans to be monitored. For example, if only two fan tachometer signals are going to be monitored set the jumper to the "2" position. The factory setting is "3."

Settings (J5)

Trigger Speed (W_A): Use this jumper to set the trigger speed.

Position L = 1000 PPM
Position M = 2000 PPM (Factory Setting)
Position H = 4000 PPM

Since fan tachometer circuits are designed with one, two, or even more pulse outputs per revolution, settings are listed in pulses per minute (PPM) rather than revolutions per minute (RPM). Given the fan's rated speed (W) and number of pulses per revolution (N), use the following formula to select the trigger speed (W_A):

$$W_A = W \times N \times 0.4$$

(Note: When used with a SmartFan speed controller the factor in the above equation should be changed from 0.4 to 0.3.)

For example, a 3300 RPM fan with two pulses per revolution would have a trigger speed (W_A) of

$$W_A = 3300 \text{ RPM} \times 2\text{PPR} \times 0.4 = 2640 \text{ RPM}$$

Since the 2000 PPM trigger is closest, set jumper J5 to the "M" position.

The alarm trigger accuracy is +/- 20%.

LED Outputs – (J6)

Both normally on (green) and normally off (red) LED outputs are provided. Two leaded and three leaded (common Cathode) Bi-colored LEDs can also be used. Choose LEDs with rated forward voltage (V_f) between 1.6 and 2.4 VDC at forward current (I_f) of between 15 and 25 mA. Nominal current applied to the LEDs is 8 mA.

Led Connections

Pin	FUNCTION
K	Red LED Cathode
R	Red LED Anode
G	Green LED Anode
K	Green LED Cathode

Isolated Alarm Outputs (J8)

These outputs provide both normally open and normally closed isolated outputs permitting connection to logic circuits or other loads with no electrical connection to the TachScan-3 circuit.

Part No. 030M320 provides simultaneous open collector outputs from optical isolators, which are intended to drive logic circuits. These outputs can sink up to 1.0 mA at 0.4 VDC. A maximum of 30 VDC can be applied to alarm terminals. The normally closed output also triggers in the event of cooling system power failure.

Part No. 030M320R provides simultaneous outputs from a Dual-Pole MOS Relay, which are intended to drive heavy loads. These outputs have a maximum on-state resistance of 50 Ω. Maximum sinking current is 100 mA. A maximum of 230 VAC can be applied to alarm terminals. The outputs also trigger in the event of cooling system power failure.

Isolated Output Connections

Part No.	Pin 1A	Pin 1B	Pin 2A	Pin 2B
030M320	NC Emitter	NC Collector	NO Emitter	NO Collector
030M320R	NC	NC	NO	NO

Note: At Power-up, all outputs are held in normal state for 10 seconds permitting the fans to come up to speed.