

SmartFan[®] Wisp II — Speed control for DC fans



SmartFan Wisp II is designed to control small DC fans. The low voltage version includes a temperature alarm for increased safety. The high voltage version accepts a 38 to 75 VDC supply voltage range and includes a voltage limiter set to 50 VDC.

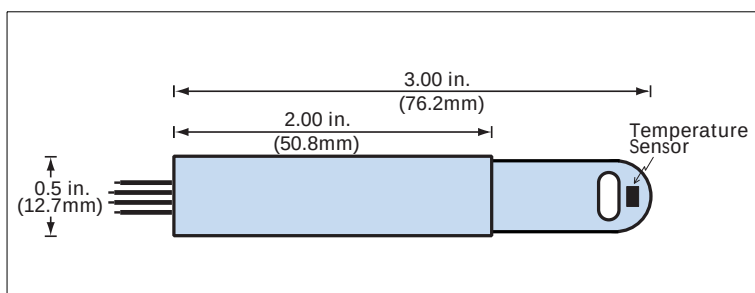
Wisp II includes both a temperature sensor and control circuit packaged in a probe for convenient remote or on-fan mounting. The controller uses a linear operating principle, applying a smooth DC voltage to the fans. It is available for both Closed-Loop (temperature regulating) and Open-Loop (temperature compensating) applications.

The Wisp II controller's power rating is sufficient to control up to three typical 120 mm fans. The low voltage version can be used with 12 or 24 VDC fans. The high voltage version is used with 48 VDC fans.

*For additional information see:
page 13 Design Considerations*

FEATURES

- Noise reduction typically 15 dB(A) at idle speed
- Completely self contained including sensor
- Controls 12, 24 and 48 VDC fans
- Low voltage version (018W1XXX) accepts a supply voltage range of 11.5 to 30 VDC and includes a temperature alarm output that can drive logic or a red LED
- High voltage version (048W0XXX) accepts a supply voltage range of 38 to 75 VDC and includes a voltage limiter set to 50 VDC
- 70°C maximum operating temperature
- Supplied with 15 inch (24 AWG) wires and mounting clamp.



SPECIFICATIONS

Part Number	Type ¹	Supply Voltage Range	Maximum Watts to Fans ²	Control Temperature	Full Speed / Idle Speed Temperatures
018W135 018W140	Closed-Loop	11.5 - 30 VDC	20 Watts	35°C 40	N/A
048W035 048W040	Closed-Loop	38 - 75	20 ³	35 40	N/A
018W135P	Open-Loop	11.5 - 30	20	N/A	35°C/23°C
048W035P	Open-Loop	38 - 75	20 ³	N/A	35°C/23°C

¹ Closed-Loop types are installed near equipment exhaust, Open-Loop types at equipment inlet.

² Air temperature of 70°C or less, air velocity of 200 ft/min or greater. See page 13 for derating above 70°C.

³ Above 50 VDC supply, power is linearly derated, reaching 10 Watts at 75 VDC.

U.S. Patents 4,659,290, 4,722,699 and 5,364,026

INSTALLATION

Mounting

Mount Wisp II in a moving air stream using the cable clamp supplied. Avoid placing the sensor (located at the tip) near a hot component as this may result in heating by radiation. To minimize heating of the sensor by the Wisp II circuits, avoid mounting the unit vertically with the sensor at the top.

Location

Install a closed-loop unit at or near the equipment exhaust where it can sense any upstream event that could affect cabinet temperature. Install an open-loop (P suffix) unit at or near the equipment inlet.

Connections

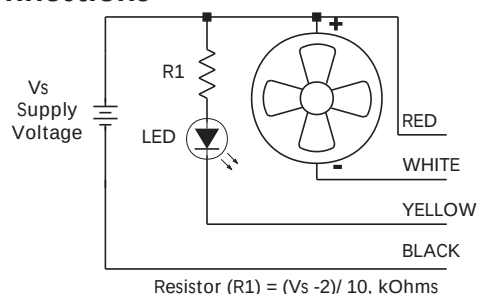


Figure 1
Connection diagram for P/N 018W0XX with LED temperature alarm indication.

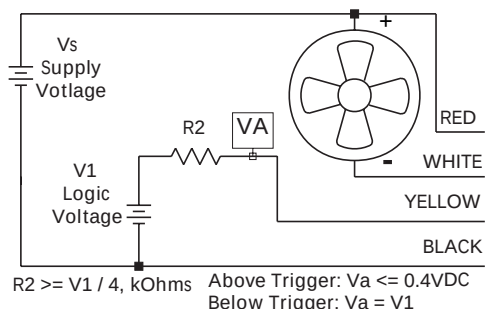


Figure 2
Connection diagram for P/N 018W0XX with logic circuit temperature alarm indication.

Temperature Alarm Output

For Part Nos. 018W1XXX, a temperature alarm signal is available through the yellow and black wires. An alarm can be indicated using an external LED (Figure 1) or logic circuit (Figure 2).

Alarm Type:	Non-Isolated Open-Collector
Trigger:	10°C Above Control Temperature
Alarm States:	Conducting (Closed), Above Trigger Cut-Off (Open), Below Trigger
Max. Voltage:	30 VDC
Max. Current:	4 mA DC at 0.4 VDC (Logic Circuit), 10 mA DC (LED Circuit)

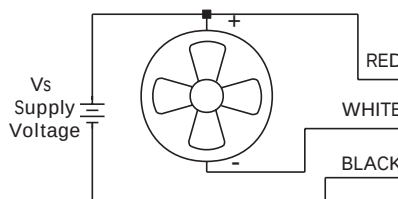


Figure 3
Connection diagram for P/N 048W0XX and P/N 018W1XX when the temperature alarm output is not used.

OPERATION

Fan Speed vs. Sensor Temperature

The relationship between fan speed, as a percentage of full speed, and sensed temperature is shown in Figure 4. Full speed occurs at the Control Temperature (T_c). Minimum speed temperature (approx. 50% of full speed) depends on part number. For closed loop units, the "X" in Figure 4 is equal to 4. For open loop units the "X" in Figure 4 is equal to 12.

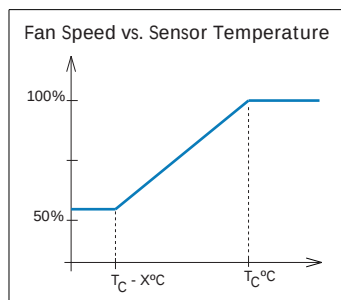


Figure 4
Fan speed vs. sensor temperature

Voltage Regulator and Limiter

Part Nos. 048W0XXX are intended to cover telecommunications applications using supply voltages ranging from 38 to 75 VDC. Wisp II regulates minimum (idle) voltage at 26 VDC. Maximum voltage applied to the fans is limited to 50 VDC. For supply voltages above 50 VDC, power is linearly derated based on the curve shown in Figure 5.

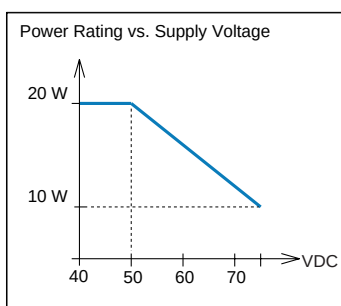


Figure 5
Power derating curve