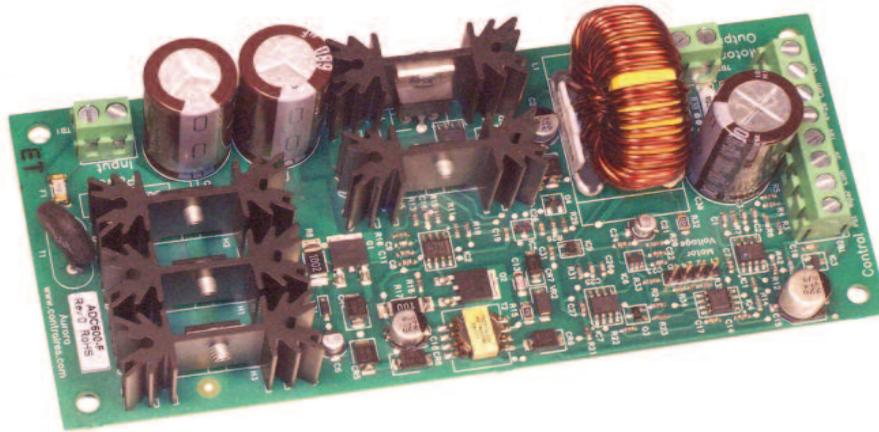


# SmartFan<sup>®</sup> Aurora

Speed Control for DC Motors



P/N ADC600-F

**SmartFan Aurora** is a compact, economical DC speed control designed for OEM applications in HVAC, electronic and industrial control markets. Aurora accepts a DC (10-72V) or AC (12-48V) power source and can control 12, 24 or 48 VDC motors. Aurora regulates DC motor speed from a control signal (0-5 VDC, 0-10 VDC, 0-20 mA or potentiometer). Voltage to the motor is varied using a buck control circuit that operates at a high frequency to achieve maximum power efficiency at minimum size. 100% testing in an ISO 9001:2008 manufacturing facility ensures a robust, quality product for your DC motor control requirements.

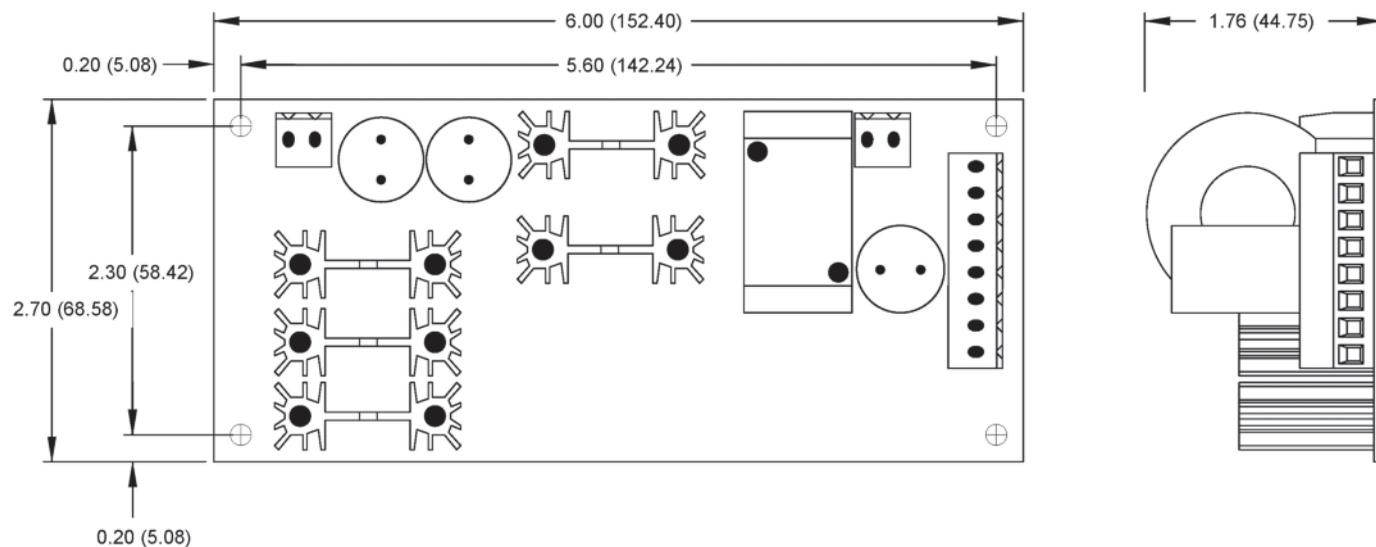
## **SPECIFICATIONS/FEATURES**

- Power Source:
  - 10 to 72 VDC
  - 12 to 48 VAC, 50/60 Hz
- Full wave bridge rectification circuit
- Current Rating: 6 Amps @ 55°C or less
- 12, 24 or 48 VDC operation set by jumper with full 0-12/24/48 VDC control range
- Filtered DC output provides a true 1.0 form factor providing important benefits:
  - Motor runs quieter
  - Motor runs cooler
  - Allows high voltage power source to run low voltage motors with out damage
- Controls motor speed based on isolated control signal inputs:
  - 0-20 mA control signal
  - 0-5 VDC control signal
  - 0-10 VDC control signal
  - Remote potentiometer
- Off-Input allows Start/Stop without breaking AC lines
- Cycle by Cycle 8 Amp over current protection
- Input is fused at 10 Amps

## **SPECIFICATIONS/FEATURES**

- Soft start and current limiting at start up
- Full analog feedback for closed loop regulation
- High power efficiency, typically greater than 90%
- Special factory configuration option available to set:
  - IR Comp
  - Current Limit
  - Accel/Decel Rates
  - Min/Max Speeds
- Mounting: PCB mount or DIN Rail mount
- Connections: Terminal blocks
- Compatible with SmartFan TachScan Speed Alarms
- Operating temperature: -20°C to 55°C
- Storage temperature: -40°C to 125°C
- Weight: 8.3 oz. (236 grams)
- RoHS (6/6) compliant

# SmartFan<sup>®</sup> Aurora



Aurora Dimensional Drawing

**FEATURES:**

**Input Power:** Aurora can accept power from an AC (12 to 48V) or DC (10 to 72V, 50/60 Hz) source. Aurora can supply up to 6.0 Amps to the motor load with a maximum 55°C operating temperature.

**Input Power Fuse:** A 10.0 Amp input power fuse is provided to protect the Aurora from over-current conditions.

**Inrush Current:** The Aurora utilizes a passive inrush limiter circuit to control initial contact current.

**Fan Soft Start:** At the application of power, the firmware in Aurora limits the maximum available output voltage to 0 VDC. Then, over a period of approximately 2 seconds the available voltage is raised to 100%.

**Motor Speed Control:** Motor speed is varied by adjusting the voltage applied to the motor. Voltage adjustment is accomplished with a current mode, buck type control circuit. The motor voltage range is 0-12 VDC for 12 VDC motors, 0-24 for 24 VDC motors and 0-48 VDC for 48 VDC motors.

**Current Limiting:** Cycle by cycle 8 Amp over current protection with 6 Amp power limiting feedback control.

**Off-Input:** Connection of OFF to COM terminals of TB2 will set the maximum available voltage to 0 VDC.

**Specialized Configurations of the Aurora**

The following parameters can be specialized by CRI through software and/or component values changes:

- Special factory configuration option available to set:

Parameter	Factory Default
IR Comp	Not Implemented
Current Limit	6 Amps
Accel/Decel Rates	3 Seconds
Min/Max Speeds	0 to 12, 24, 48 VDC

- Optimized DC filtering of an AC power source

**Customized Configuration of the Aurora**

Contact Control Resources’ Sales Department for details on custom products.

**INSTALLATION**

**Mounting:** Mount the Aurora on a flat surface using all four mounting holes for maximum support. The board may be mounted using metal screws or Nylon supports such as Richco No. CBS-4-19. Alternatively the Aurora can be mounted on a DIN rail using DIN rail kit, CRI P/N DIN600-F

**CONNECTIONS**

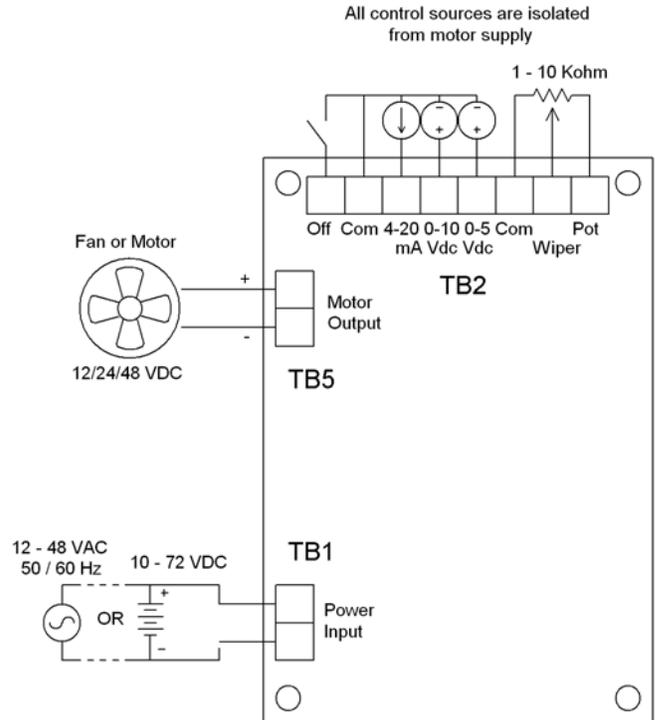


Figure 1: Aurora connections diagram

**Input Power Connection**

Refer to Figure 1 for input power wiring. Aurora can supply up to 6.0 Amps at 55°C maximum operating temperature to the motor load.

**Motor Output Connection to Header TB5**

Fans or motors are connected to header TB5. Refer to Figure 1 for details of wiring. More than one fan can be connected in parallel to header TB5 as long as the total current draw of the fan load does not exceed the 6 A mp rating of the Aurora.

**Isolated Voltage Control Signal Connections**

The Aurora will accept a signal producing an output of 0-5 VDC or 0-10 VDC. Connection is made at Terminal Block TB2. Refer to Figure 1, Aurora Connections Diagram.

**Isolated Current Control Signal Connection**

The Aurora will accept a signal producing an output of 0-20 mADC. Connection is made at Terminal Block TB2. Refer to Figure 1, Aurora Connections Diagram.

**Isolated Potentiometer Signal Connection**

The Aurora will accept a signal from a 1KΩ to 10KΩ potentiometer. Connection is made at Terminal Block TB2. Refer to Figure 1, Aurora Connections Diagram.

**OPERATION**

**Output Voltage Setting (J1):** The Aurora can provide power to 12 VDC, 24 VDC or 48 VDC motors. Table 1 describes the function of each setting. If the shunt is removed, the default output voltage is 12 VDC.

Position on Header J1	Motor Voltage
12V (Factory Setting)	0 – 12 VDC
24V	0 – 24 VDC
48V	0 – 48 VDC

Note: Maximum output voltage will be approximately 2.5V below the supply voltage at full load.

**Motor Speed Control**

**Analog control signal input motor control:** The voltage applied to the motor is determined by the analog control signal input (0-5V, 0-10V, 0-20mA). The relationship between motor voltage and control signal is shown in Figure 2.

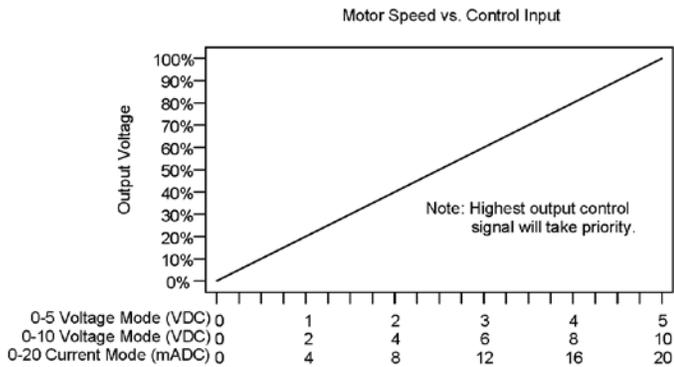


Figure 2: Motor voltage vs. analog control signal input

**Connection to a TachScan-3 Fan Alarm:** In a fan control application a SmartFan TachScan-3 fan alarm can be used to monitor fan speed and provide an alarm if a fan drops below a set speed. In addition an automatic full speed signal from the TachScan-3 can be connected to the Aurora. An example of how the Aurora can be interfaced with the Tachscan-3 is shown in Figure 3. In this case, the normally open isolated alarm output (J8:2A, 2B) from the Tachscan-3 is connected to header TB5 on the Aurora. When the Tachscan-3 senses that the speed of one or more fans drops below the trigger speed, the output closes and the Aurora increases the speed of the fans to full. See the Tachscan-3 product pages for additional details. Similar configurations can be used with the Tachscan-9.

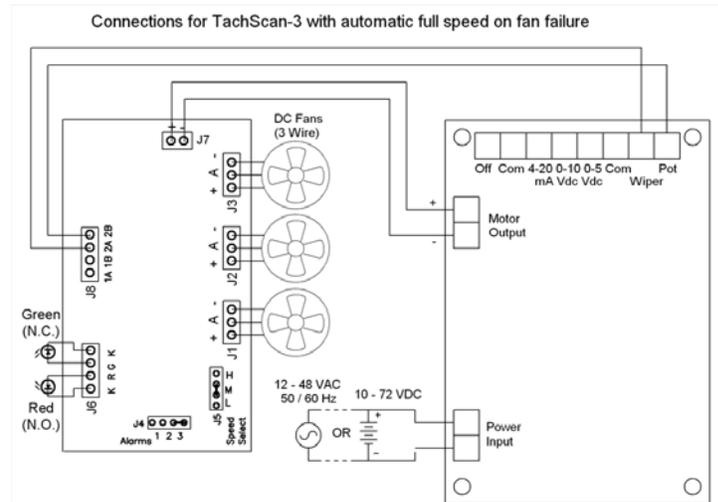


Figure 3: Connection diagram for interface of Tachscan-3 and Aurora.

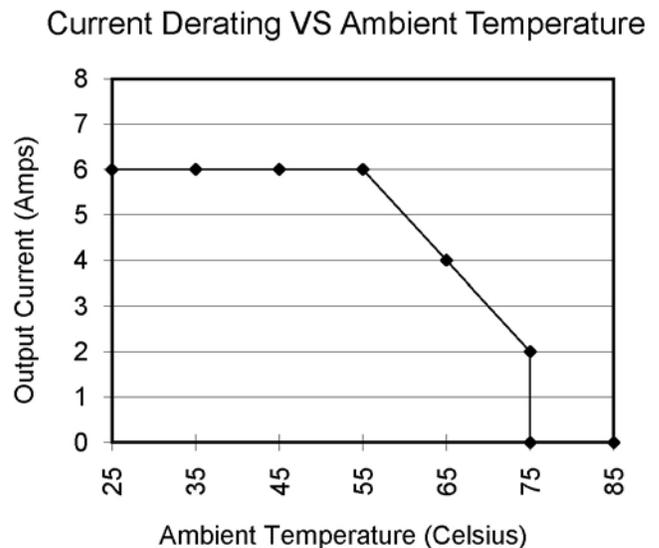


Figure 4: Derating curve