



HIRED-HAND®

System 100 Variable Speed Controller

Three Stage Environmental Controller

**Hired Hand, Inc.
1733 Co Rd 68
PO Box 99
Bremen, AL 35033**

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WARNING

When this controller is used in a life support heating and ventilation system where failure could result in loss or injury, the user should provide adequate backup, or accept the risk of such loss or injury.

System 100 Variable Speed Controller

Users Manual

Introduction

With the purchase of your new Controller you have taken a step forward into the world of computerized climate control. The Hired Hand System 100 Variable Speed Controller offers the user a simple, low maintenance method of ventilation control.

The Controller is available in two models: One is a simple variable speed; the other has an additional 3 stages--1 heat and 2 cools.

Basic Operation

The System 100 Variable speed controller is designed as a standalone unit with the capability to supply a constant 10 amps to a load. Day-to-day operation of the system only involves changing the target temperature setting on the facepad.

The user is given 2 choices of programs for the stages. Program 'A' is geared for a tight environmental control while Program 'B' is designed to lower energy bills while still maintaining an acceptable environment. Program 'B' uses a slightly wider band of temperatures that satisfies the controller.

Controls

External Controls

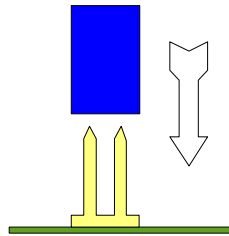
The System 100 has only one external control. This is a knob on the facepad that changes the system's Target Temperature. Target temperature is the basis for all operations of the controller. The stages operate on target temperature by the offset--differential method, and the Variable Speed fan will run at minimum speed when the temperature sensed by the controller is at or below target temperature.

Internal Controls

The controller has three controls on the inside that control the operation of both the stages, and the settings for the variable speed fan stage. These controls should only need adjusting if your setup requires a major change.

WARNING: Do not open controller box for any reason with power applied to the controller.

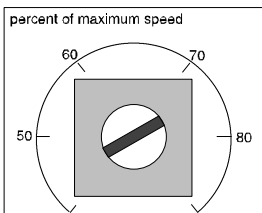
<input checked="" type="checkbox"/>	STAGE PROGRAM
<input checked="" type="checkbox"/>	OFF = PROGRAM A
<input type="checkbox"/>	ON = PROGRAM B



This jumper controls the stage programs (offset and differential). Without the jumper installed, the controller will be in program A. If the jumper is installed, the controller will be in Program B.

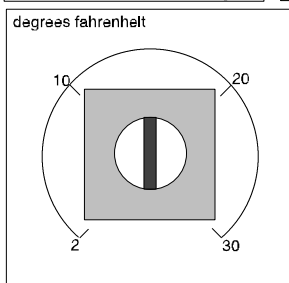
Program A is designed to give a strict temperature control, whereas program B is designed with a greater temperature range that satisfies the controller, thus using less power (less hunting, and overshoot). Each program is detailed later in this manual.

Var. Minimum Adjust



The Variable Minimum adjustment sets the minimum speed (in percent) of the fan. The fan will run at minimum speed whenever the temperature at the sensor is less than or equal to target temperature.

Var. Span Adjust

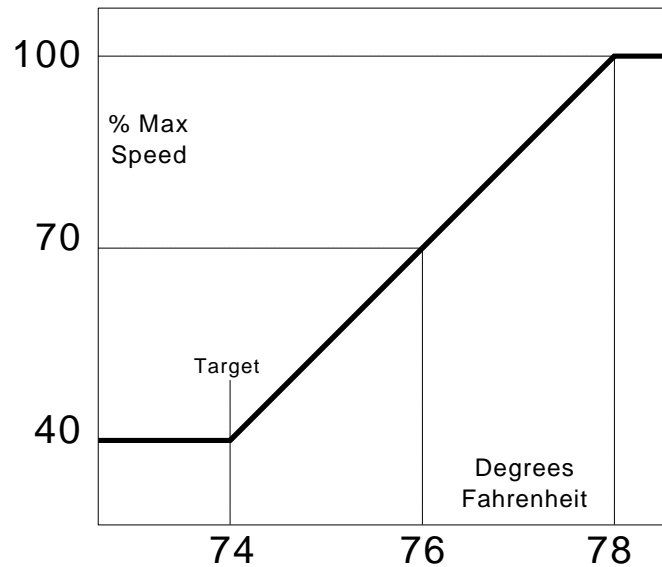


The variable span is the difference in degrees Fahrenheit between target temperature, and the temperature the fan reaches maximum speed. For example:

Target Temp 74F
 Variable Span 2 degrees
 Fan will be at 100% (maximum speed) at 76F.

The speed increase is smooth. (For every one degree temperature increase, the fan speed will increase the same amount for the full range of the controller.) The drawing on the next page explains this linear increase.

Variable Speed Operation



For this example: **Target Temp**--74F, **Variable Span**--4 degrees, **Variable Minimum**--40 percent. If temperature increases to 76 degrees, the speed of the fan will increase to 70 percent. Likewise, another increase of two degrees (78F) would increase the speed of the fan to 100%

Stage Programs

	Program A On / Off	Program B On / Off
Cool 2	+2 / +1	+4 / +3
Cool 1	+1 / 0	+2 / +1
Variable Speed	Span	Span
Target	Dial	Dial
Heat	-2 / -1	-3 / -1

Program A

Program A is used for tight control of temperatures in the house. Remember, all stages work from target temperature:

Target Temp 74F
Variable Span 2F

Using these presets, the variable speed fan will run at max. speed at 76F. If temperature should still rise, Cool stage 1 will engage at 77F. If temperature still rises, Cool Stage 2 would engage at 79F.

As the House cools, Cool stage 2 would shut off at 78F, Cool stage 1 will shut off at 76F. If Temperature drops below target temperature, the heat stage will turn on at 72F, and shut off at 73F.

Program B

Program B is used for tight control of temperatures in the house. Remember, all stages work from target temperature:

Target Temp 74F
Variable Span 2F

Using these presets, the variable speed fan will run at max. speed at 76F. If temperature should still rise, Cool stage 1 will engage at 78F. If temperature still rises, Cool Stage 2 would engage at 80F.

As the House cools, Cool stage 2 would shut off at 79F, Cool stage 1 will shut off at 77F. If temperature drops below target temperature, the heat stage will turn on at 71F, and shut off at 73F.

Calibration of Target Temperature

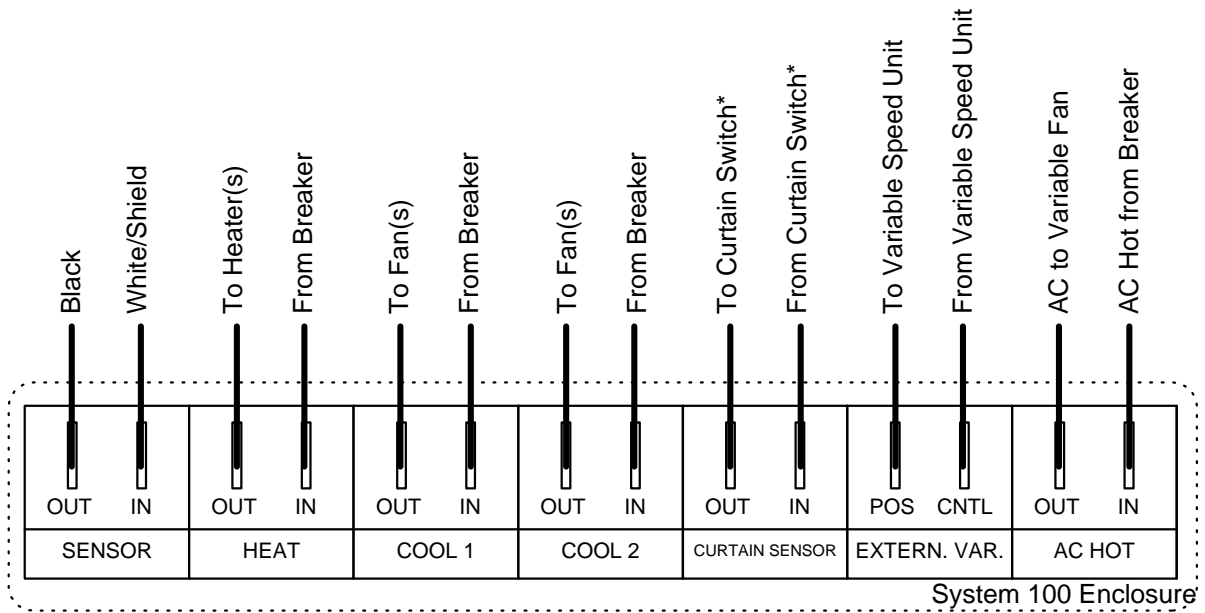
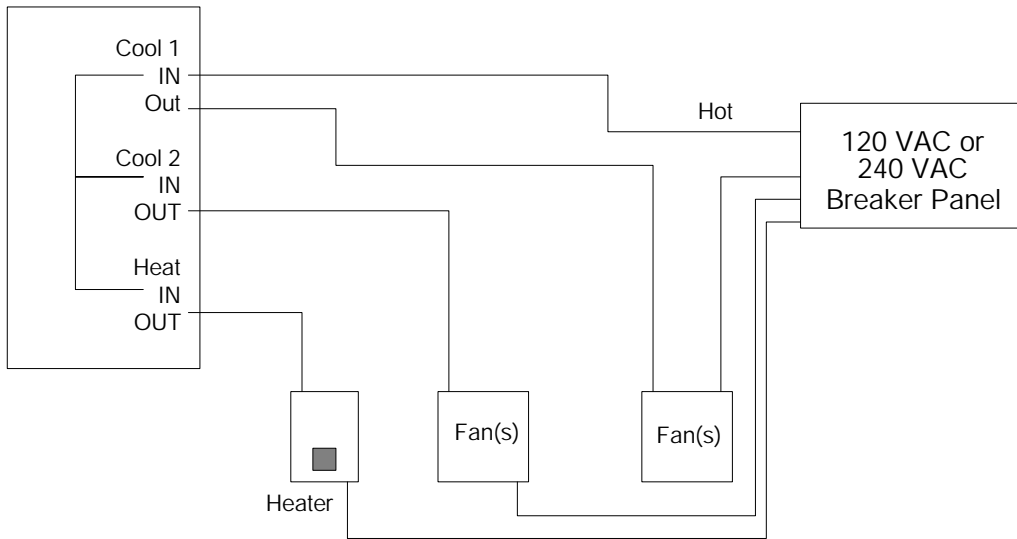
If the controller does not seem to be operating at the correct temperatures, you may need to calibrate the target temperature knob. For this you will need an Allen wrench.

Turn the knob until the words "VAR FAN" are flashing. Then *slowly* turn the knob counter clockwise until the words stop flashing. This position is the actual temperature position. Loosen the Allen screw in the knob, then remove the knob. Look at a reliable thermometer near the sensor, and replace the knob with the white dot aligned with the correct temperature. Tighten Allen screw, and reset target temperature.

Wiring Specifications

Warning: Do not connect more than six amps of load to any one stage. The Variable Speed Circuit will carry up to ten amps.

Stage Wiring



* These terminals come with a wire jumper installed. If you have a curtain switch that will tell the controller when the curtains are open, you must remove the jumper, and connect the terminals through the switch.