

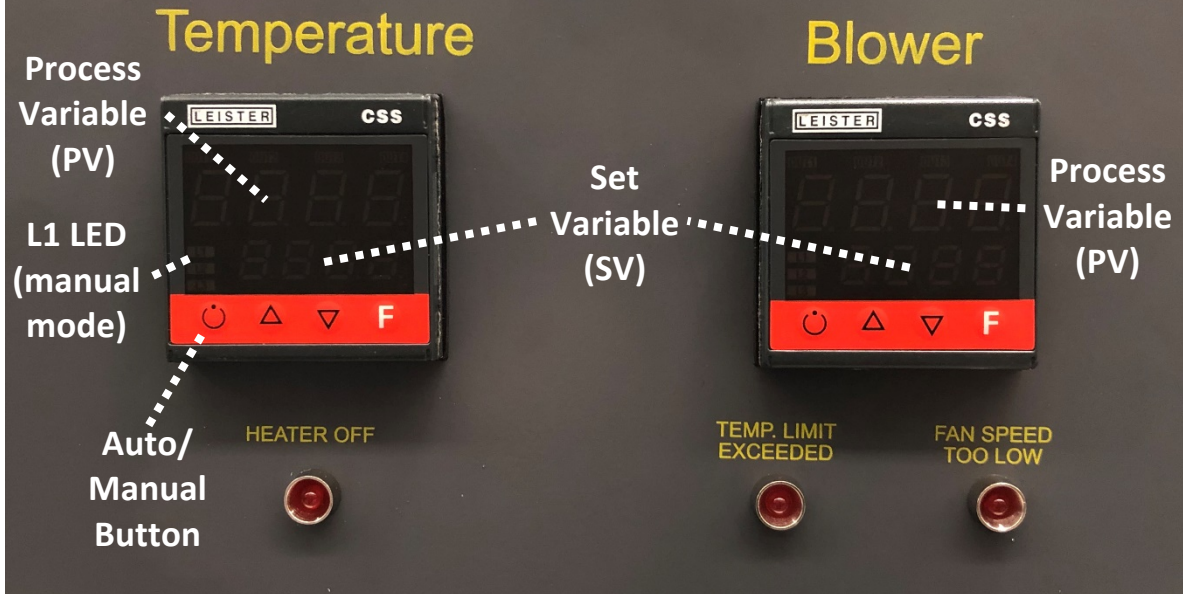
# MISTRAL-6 Heat Gun Controller Manual

SEELine Operator Version

K150 SEELine

Ver. 1.0 3/23/2020

# Hot Air Controller



**DO NOT  
PLUG INTO  
NETWORK  
JACK**

# 1. Setup

## Step 1:

Do not yet power on the controller box. Plug one end of a Cat-6 cable into the Cat-6 jack on the rear of the controller box, and the other end into the Cat-6 jack on the data room-to-vault patch panel. **Only plug in the Cat-6 cable to the patch panel; do not plug in the Cat-6 cable to a network connection jack.**

## Step 2:

Enter the 88 Vault. Keep the heat gun powered off and unplugged for now. Plug one end of a Cat-6 cable into the female Cat-6 jack on the heat gun, and plug the other end into the corresponding Cat-6 jack on the vault-to-data room patch panel.

## Step 3:

Attach a K-type thermocouple to the location of the component that you wish to monitor. Plug the other end of the thermocouple into the thermocouple signal transmitter unit on the heat gun stand. Be sure to keep track of the positive and negative leads of the thermocouple. If a different thermocouple type is desired, refer to the section 'Changing Thermocouple Type' (Page 8). **If the customer does not wish to use a thermocouple, and instead wishes to monitor the temperature of their part via their own equipment, plug in a thermocouple anyway and leave the leads connected, but off the part.**

## Step 5:

Power on the controller box. On the temperature controller, ensure that status LED 'L1' is lit by pressing the auto/manual key to the left of the up arrow. This puts the temperature controller into manual mode. In manual mode, the Set Variable (SV) directly controls the output power of the heat gun from 0.0 – 100.0%. Use the arrow buttons to turn it to 0.0.

If automated temperature control is desired, leave the temperature controller in manual mode for now. This is to ensure that when automatic mode is later enabled, the heat gun will start heating at minimum power instead of maximum power.

## Step 6:

Use the up or down arrows on the blower controller to specify air volume from 30.0% (3.72cfm) - 100.0% (12.4 cfm) of fan speed. **Going below 30.0% disables the heating element of the heat gun until the percentage is again raised above 30.0%. The 'Fan speed too low' LED will be lit while this fault is active.** If lower air volume is desired, refer to the section 'Changing the Minimum Fan Speed' (Page 10).

This minimum fan speed is programmed in order to prevent the heating element of the heat gun from overheating over prolonged use.

Step 7:

Plug in the heat gun. Power it on by holding the rotary button down for two seconds. The heat gun's blower should be blowing at the speed specified in the blower controller in the controller box. If it is not, hold the rotary button for two seconds **WHILE ALSO** turning it at least one quarter turn clockwise. This will bring up a menu. Cycle through the menu until you see 'STORE.' Press the rotary button. The blower should now be spinning at the correct percentage. The heat gun is now ready to heat the component.

The Process Variable (PV) of both the blower and temperature controllers should be displaying values. If either is displaying an error (Err for blower signal or thermocouple signal), the heating element of the heat gun will be disabled until the error is cleared. **If the customer does not wish to use a thermocouple, and instead wishes to monitor the temperature of their part via their own equipment, refer to Manual Temperature Control (Page 5).**

## 2. Manual Temperature Control

Step 1:

With the temperature controller in the controller box set to manual mode, the heat gun will constantly output a temperature from SV 0.0 (room temperature) to 100.0 (650 °C). Use the up or down arrows of the temperature controller to set your desired power percentage. If there is a signal from the thermocouple, your part will begin heating.

Note:

Under normal conditions, the Process Variable (PV) of the temperature controller will display temperature (in °C) from the thermocouple signal transmitted from the 88 vault. If the display shows 'Err,' there is a signal fault to the thermocouple transmitter. The heating element is automatically disabled until the signal to the thermocouple is restored.

**If the customer does not wish to use a thermocouple, and instead wishes to monitor the temperature of their part via their own equipment, you must bypass the automatic heating element disable function.**

In order to bypass the automatic disable function, attach any K-type thermocouple to the transmitter in the 88 vault. Ensure the leads of the thermocouple maintain contact. The thermocouple can be left hanging freely or attached to anything that is not the customer's part. The PV shown on the controller may be ignored. The part will begin heating.

# 3. Automatic Temperature Control

Step 1:

**PRESS** (do not hold) the 'F' button on the temperature control unit until '\_SP' is shown in the PV display. This is the temperature set point in automatic mode. Set this to the desired steady-state temperature.

Step 2:

**PRESS** the 'F' button on the temperature control unit until 'AL.1' is shown in the PV display. This is the maximum temperature the customer wants to set for their part. Set the desired maximum temperature. If the part reaches this temperature, the heating element will automatically disable until the part cools to below this temperature. If this condition is active, the 'Temp limit exceeded' LED will be lit.

Step 3:

**PRESS** the 'F' button on the temperature control unit until 'AL.2' is shown in the PV display. **Set this to the same value as AL.1.**

Step 4:

**PRESS** the 'F' button on the temperature control unit until 'AL.3' is shown in the PV display. **Set this to the same value as AL.1 and AL.2.**

Step 5:

**PRESS** the 'F' button on the temperature control unit until the part temperature is shown in the PV display. The controller should still be in manual mode, and the SV should show 0.0. Press the Auto/manual button to the left of the up arrow. The SV will now display the temperature set point, and will no longer display output power %. The part will begin heating to the set point you specified in Step 1. The heat gun will maintain the set point regardless of the blower speed you select (unless the 'Fan speed too low' condition is triggered). The temperature set point can be changed using the arrow buttons. The heat gun will automatically heat the component to reach and hold this new temperature set point. If you wish to change the maximum temperature limit of the part, repeat steps 2-4.

Note:

In auto mode, temperature set point can only be changed if the PV display is currently displaying the part's temperature.

## 4. Shutdown

### Step 1:

If the temperature controller is not already in manual mode, set it to manual mode by pressing the auto/manual button to the left of the up arrow. The 'L1' LED should be lit. Turn the SV down to 0.0. Do not power off the controller box.

### Step 2:

Enter the 88 vault. Hold down the rotary button on the heat gun for five seconds. The heat gun will enter 'cooldown mode,' during which the heating element is turned off and the fan spins at 100% for two minutes. After two minutes, the heat gun will automatically enter sleep mode.

### Step 3:

Unplug the heat gun from the wall plug after it has entered sleep mode.

### Step 4:

Power off and unplug the controller box. All Cat-6 and thermocouple wires may now be disconnected.

## 5. Changing Thermocouple Type

### Step 1:

Power down and unplug the controller box in the data room.

### Step 2:

Enter the 88 vault. Remove the side panel from the blue thermocouple transmitter.

### Step 3:

Refer to the legend on the side of the transmitter to change the corresponding switches to the setting for the desired thermocouple type.

### Step 4:

Plug one end of the new thermocouple type to the part and the other end into the signal transmitter. Keep track of the positive and negative leads of the thermocouple and plug them into the corresponding slots on the transmitter.

### Step 5:

Return to the data room, reconnect, and power on the controller box.

### Step 6:

On the temperature controller, **HOLD** the 'F' button until the menu shown in the Process Variable (PV) display cycle to 'InP.' Release the button when InP is displayed.



Step 7:

**PRESS** the F button when InP is displayed until 'Lo.S' is displayed. Use the up and down arrows to change the number in the Set Variable (SV) display to the number corresponding to the new thermocouple type:

K-Type: -150

J-Type: -190

T-Type: -230

R-Type: 65

S-Type: 65

B-Type: 529

N-Type: -70

C-Type: 65

Step 8:

**PRESS** the F button when InP is displayed until 'Hi.S' is displayed. Use the up and down arrows to change the number in the Set Variable (SV) display to the number corresponding to the new thermocouple type:

K-Type: 1372

J-Type: 760

T-Type: 400

R-Type: 1768

S-Type: 1768

B-Type: 1820

N-Type: 1300

C-Type: 2320

Step 9:

**HOLD** the F button until either 'Err' or the temperature reading of the thermocouple (if plugged in) is displayed. This is the default display. The temperature controller is now ready to accept the new thermocouple signal, and the controller box will function as normal. When the customer is finished, follow steps 1-8 to return the control box and signal transmitter to K-type (or other thermocouple type, if specified in advance) for the next customer.

## 6. Changing the Minimum Fan Speed

Step 1:

Power down the controller box. Unplug the controller box from the heat gun or data room-to-cave 1 patch panel.

Step 2:

Power on the controller box.

Step 3:

On the blower controller, **HOLD** the F button until 'PAS' is displayed on the Process Variable (PV) display.

Step 4:

Change the number in the Set Variable (SV) display to 99.

Step 5:

With the SV display set to 99, **HOLD** the F button until the PV display changes to 'Prot.'

Step 6:

Change the value in the SV display to '0.' This unlocks the ability to modify the alarm values. These values are normally locked out to the customer in order to protect the heating element.

Step 7:

**HOLD** the F button until the PV display returns to the fan output percentage.

Step 8:

**PRESS** the F button until 'AL.1' is displayed in the Process Variable (PV) display. Change the value in the Set Variable (SV) display to the new minimum fan speed.

Step 9:

**PRESS** the F button until 'AL.2' is displayed in the PV display. Change the value in the SV display to the same value as AL.1.

Step 10:

**PRESS** the F button until 'AL.3' is displayed in the PV display. Change the value in the SV display to the same value as AL.1 and AL.2.

Step 11:

**PRESS** the F button until the PV display shows 'Err.' Plug in the controller box to the heat gun or data room-to-cave 1 patch panel. The PV display should now display fan output percentage. The blower controller is now configured to the new minimum fan speed. Tell the customer to avoid using full heating element power for extended periods of time in this new configuration in order to prevent the heating element from overheating.

Step 12:

When the customer is finished, unplug the controller box from the heat gun or the data room-to-cave 1 patch panel and follow steps 8-10 to return the AL.1, AL.2, and AL.3 values to 30.

Step 13:

Follow steps 3-5 to return to the 'Prot' menu.

Step 14:

Change the SV display value in the Prot menu to 14.

Step 15:

**HOLD** the F button until the PV display returns to 'Err.' Plug in the controller box to the heat gun directly or through the data room-to-cave 1 patch panel. The heat gun does not need to be powered on for this step, as long as the controller box has an unbroken connection to it. Verify the minimum fan speed settings are correct by attempting to turn the blower below 30.0. The 'Fan speed too low' and 'Heater off' LEDs should light.

# 7. Troubleshooting

## 'Fan speed too low' LED is lit:

The blower controller output percentage is set below the minimum value (default 30.0). Raise the blower controller output percentage above this minimum value, or refer to the section 'Changing the Minimum Fan Speed' (Page 10) to change the minimum value.

## 'Temp limit exceeded' LED is lit:

The part temperature, as measured by the thermocouple, has exceeded the temperature limits specified in the temperature controller. Verify the thermocouple has proper contact to the part. Wait for the part to cool down, or refer to the section 'Automatic Temperature Control' (Page 6) to change the maximum temperature alarm settings.

## The temperature controller is reading an impossibly high temperature:

The thermocouple has likely fallen off the part. If the thermocouple leads separate, the thermocouple signal transmitter will default to its maximum signal output, which will read as an extremely high temperature. In this state, the controller will trigger the 'Temp limit exceeded' condition to protect the part. Fix the thermocouple connection, or replace the thermocouple if it is faulty.

## 'Heater off' LED is lit, but neither 'Fan speed too low' or 'Temp limit exceeded' LEDs are lit:

There is either a thermocouple signal fault or the connection to the heat gun is broken. In either case, the controller box and heat gun are set by default to disable the heating element. If the blower controller PV display shows 'Err,' there is no connection to the heat gun. Trace the Cat-6 cable and ensure the correct patches are used.

If the temperature controller PV display shows 'Err,' there is a thermocouple transmitter signal error. Trace the thermocouple cable and ensure the Cat 6 cable is properly connected to the heat gun. Check to see that there are no loose leads from the female Cat 6 jack on the heat gun to the signal transmitter.

## There is no error LED lit, but the heat gun is not accepting remote operation inputs:

Enter Cave 1. On the heat gun, HOLD the rotary button for two seconds **WHILE ALSO** turning it at least one quarter turn clockwise. This will bring up a menu. Cycle through the menu until you see 'HEA' followed by a letter. Press the rotary button and cycle until that letter changes to an 'A,' if it is not already. HOLD the rotary button for two seconds to save this change. Cycle through the menu until you see 'Air,' followed by a letter. Press the rotary button and cycle until that letter changes to an 'A.' HOLD

the rotary button for two seconds to save this change. Cycle through the menu until you see 'STORE.'  
Press the rotary button.

The heat gun display is showing an error code (E001c - E009c)

Refer to the MISTRAL-6 SYSTEM manufacturer's manual, find the section for 'Error messages.' Follow the troubleshooting guide in the manual.