

# Digital High/Low Thermostat

Owner's Manual

**Model:** HF-8056

**PNEG-1499**

Date: 05-28-15



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## Check List

1. All wire connections
2. Factory values programmed
  - a. Value 1 set to (F)
  - b. Value 2 or "S1" set to (100)
  - c. Value 3 or "DIF1" set to (5)
  - d. Value 4 set to (H1)
  - e. Value 5 or "S2" set to (130)
  - f. Value 6 or "DIF2" set to (5)
  - g. Value 7 set to (H2)
3. All items included in packaging.
4. Safety decal installed on side of thermostat
5. Aesthetic appearance
6. Manual
7. Vendor Instruction Sheet

Tester Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**All information, illustrations, photos and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.**

# Contents

<b>Chapter 1 Safety</b> .....	<b>4</b>
Safety Guidelines .....	4
Cautionary Symbols Definitions .....	5
Safety Sign-Off Sheet .....	8
<b>Chapter 2 Safety Decals</b> .....	<b>9</b>
<b>Chapter 3 Installation Instructions</b> .....	<b>10</b>
<b>Chapter 4 Electrical Connection</b> .....	<b>11</b>
Thermostat Connection to Standard Heater Control .....	11
Thermostat Connection to Deluxe Heater Control .....	13
<b>Chapter 5 Programming</b> .....	<b>14</b>
Programming Set Point Values .....	14
<b>Chapter 6 Parts List</b> .....	<b>15</b>
Thermostat Assembly High-Low 2 Stage Digital (HF-8056) .....	15
<b>Chapter 7 Appendix</b> .....	<b>16</b>
Troubleshooting Error Messages .....	16
<b>Chapter 8 Warranty</b> .....	<b>17</b>

## 1. Safety

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### Safety Guidelines

Safety guidelines shall be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Save these safety guidelines for future reference.

As owner or operator, you are responsible for understanding the requirements, hazards and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations shall not be made to the equipment. Alterations can produce dangerous situations resulting in **SERIOUS INJURY or DEATH**.

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction shall be consulted before installations are made.

When necessary, you shall consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment shall read this manual. This manual shall be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

## Cautionary Symbols Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.



This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **may result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **may result in minor or moderate injury.**



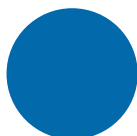
This symbol is used to address practices not related to personal injury.



This symbol indicates a general hazard.



This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005

# 1. Safety

## Follow Safety Instructions

- Warning: If the information in the manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.
- Carefully read and follow all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine correctly. Do not operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.



ST-0025

## Use Personal Protective Equipment

- Use appropriate personal protective equipment:

**Eye Protection**



**Head Protection**



**Hearing Protection**



**Foot Protection**



**Hand Protection**



**Fall Protection**



**Respiratory Protection**



- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004

### Install and Operate Electrical Equipment Properly

- Electrical controls should be installed by a qualified electrician and must meet the standards set by the National Electric Code, Canadian Electrical Code and all local and state codes.
- Disconnect and lock out all power sources before installing wires/cables or servicing equipment.
- Heater must be interlocked with an appropriately sized fan and a thermostat must be installed for safe operation.



ST-0026

### Prevent Roof Damage Due to Vacuum Pressure

- Roof damage can result from excessive vacuum or internal pressure from fans or other air moving systems. The manufacturer does not warrant this type of roof damage.
- Adequate ventilation and/or “makeup air” devices should be provided for all powered air handling systems.
- The manufacturer does not recommend the use of downward flow systems (suction).
- Severe roof damage can result from any blockage of air passages.
- Running fans during high humidity/cold weather conditions can cause air exhaust or intake ports to freeze.



ST-0028

### Exercise Caution When Drying Flammable Grains

- Be aware that some grains are highly flammable including but not limited to rapeseed, canola, linseed, sunflower and milo.
- All grain and seed must be whole (minimal cracking or crushing), clean and dust free before drying.
- Avoid dust and chaff from being drawn into the fan and heater.
- To reduce risk of fire, keep the fan, heater, drying plenum and ducts clean at all times.
- In the event of a fire (or suspected fire):
  1. Shut down the entire dryer.
  2. Turn OFF fuel at the tank or supply valve.
  3. Shut off and lock electrical power.
  4. Evacuate the area.
  5. Call the fire department.



ST-0032





The safety decals on your equipment are safety indicators which must be carefully read and understood by all personnel involved in the installation, operation, service and maintenance of the equipment.

To replace a damaged or missing decal, contact us to receive a free replacement.

### GSI Decals

1004 E. Illinois St.  
Assumption, IL 62510  
Tel: 1-217-226-4421

Location	Decal No.	Decal	Description
Thermostat	DC-889	 <p>The decal features a yellow triangular warning symbol with a black border, containing a hand being struck by a lightning bolt. To the right of the symbol is a red rectangular box with a white exclamation mark and the word 'DANGER' in white. Below this is the text 'HIGH VOLTAGE' in bold, followed by 'Will cause injury or death.' and 'Lockout power before servicing.' in a smaller font. The decal number 'DC-889' is printed vertically on the right side. At the bottom left, it reads 'GSI Group Inc. 217-226-4421'.</p>	High Voltage Danger Decal

### 3. Installation Instructions

1. Mount the thermostat control on the right side of the fan transition. Locate a suitable location on the bin wall that will allow the power cord to reach the heater and the control to be at eye level for easy access.
2. Use the self-drilling screws (S-280) provided in the packaging to mount the control.
3. Run the power cord to the heater control box and make the connections as shown in the electrical connection section on pages of this manual.
4. Mount the thermostat sensor 24" to the RIGHT of the transition. Use the sensor mounting plate (HF-8058) as a template. This part has holes to match the hills of a 2.66" and 4.00" bin sidewall.
5. Use the screws (S-280) provided to mount the plate (HF-8058) on the sidewall. The large hole on the plate should be centered on a valley of the bin corrugations. The plate should be mounted approximately in the center of the plenum at the closest valley.
6. Use the hole in the mounting plate as a guide and drill a pilot hole. Once the pilot hole is drilled in the sidewall, remove the mounting plate.
7. With the plate removed, enlarge the pilot hole to 1/2" diameter.
8. Attach the sensor of the thermostat to the mounting plate using the cord connector (HF-8057). The sensor should extend approximately 3.00" beyond the plate. If not, then adjust the sensor length by loosening the cord connector and moving the Sensor.
9. Insert the sensor into the 1/2" hole and re-attach the mounting plate using the screws (S-280).
10. Caulk the area around the mounting plate to seal any openings.

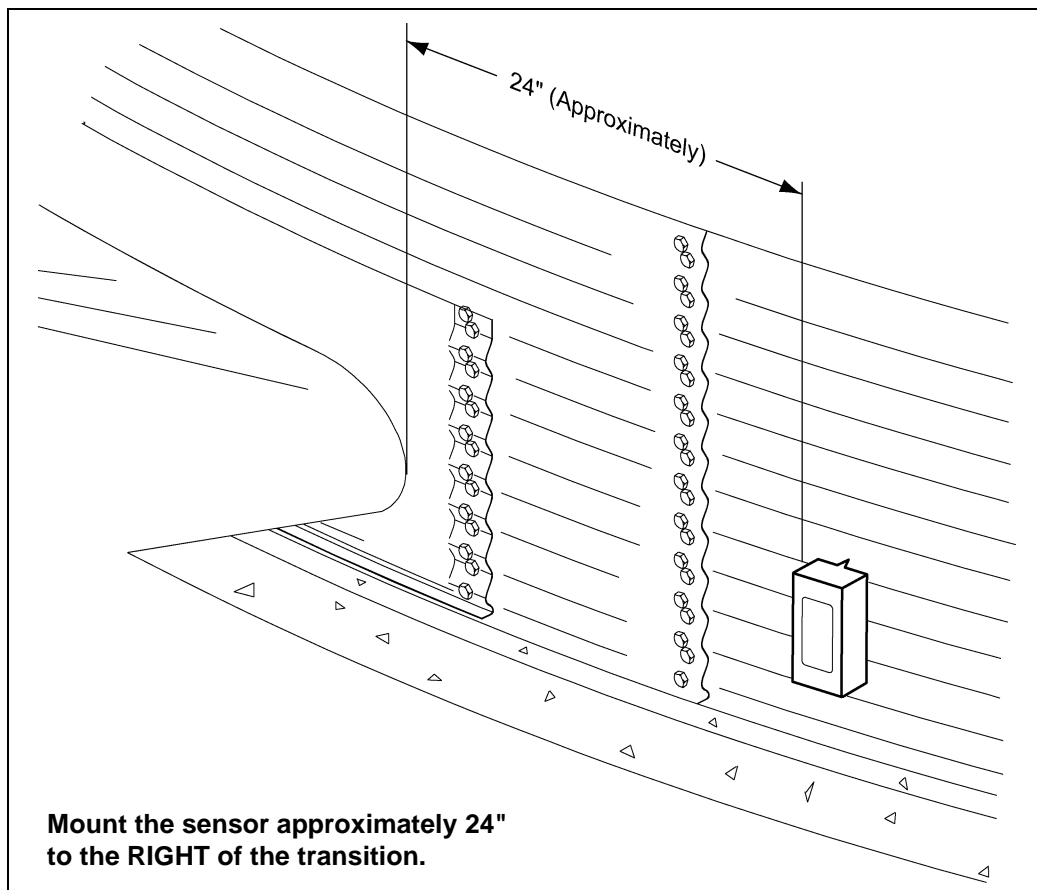


Figure 3A

Standard electrical safety practices and codes should be used when working with a heater. Refer to the National Electric Code Standard Handbook by the National Fire Protection Association. *A qualified electrician should make all wiring installations.*

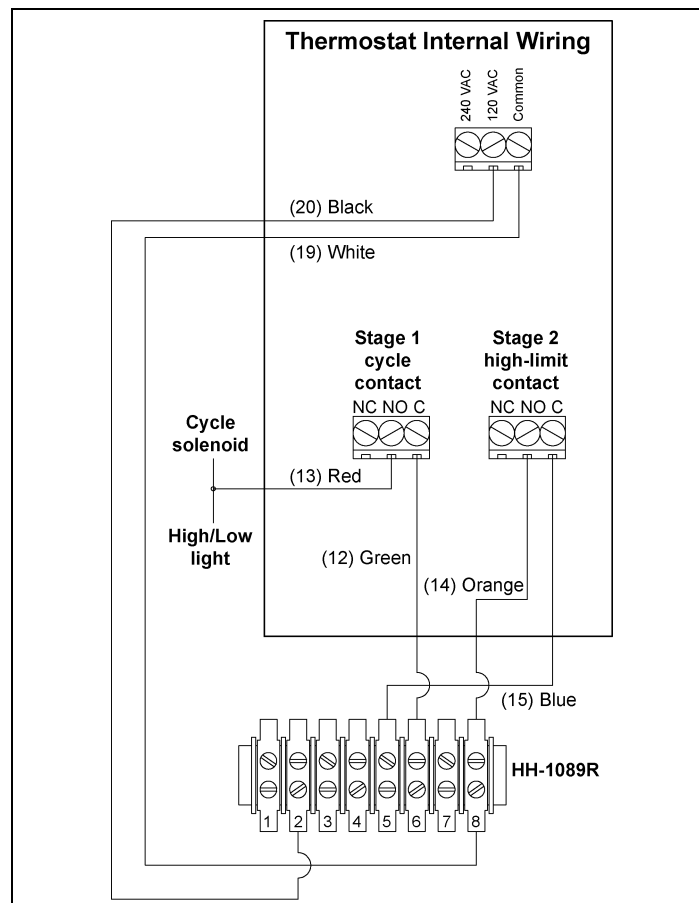


**Always disconnect and lock out power before working on or around heater.**

### Thermostat Connection to Standard Heater Control

#### Thermostat Connection to Standard Terminal Strip on Heaters Built Prior to 2007.

1. Connect power cord to fan control box.
2. Connect the BLACK 120VAC power wire to terminal 2.
3. Connect the WHITE Neutral wire to terminal 8.
4. Connect the GREEN Stage 1 Common wire to terminal 6.
5. Connect the RED Stage 1 N/O wire to the high/low light and cycle solenoid.
6. Connect the ORANGE Stage 2 Common wire to terminal 8.
7. Connect the BLUE Stage 2 N/O wire to terminal 5.



**Figure 4A** Heaters Built Before 2007 (HF-7356 Flame Probe Checking Terminal Strip)

## 4. Electrical Connection

### Thermostat Connection to Standard Terminal Strip on Heaters Built in 2007 to Present

1. Connect power cord to fan control box.
2. Connect the BLACK 120 VAC power wire to the ON/OFF switch. Make this connection so this switch will also control the thermostat power.
3. Connect the WHITE Neutral wire to terminal 8.
4. Connect the GREEN Stage 1 Common wire to terminal 6.
5. Connect the RED Stage 1 N/O wire to the high/low light and cycle solenoid.
6. Connect the ORANGE Stage 2 Common wire to terminal 1.
7. Connect the BLUE Stage 2 N/O wire to high limit circuit on the incoming L1 power.

**NOTE:** Terminal strip may or may not be present in heater to connect wires in thermostat circuits.

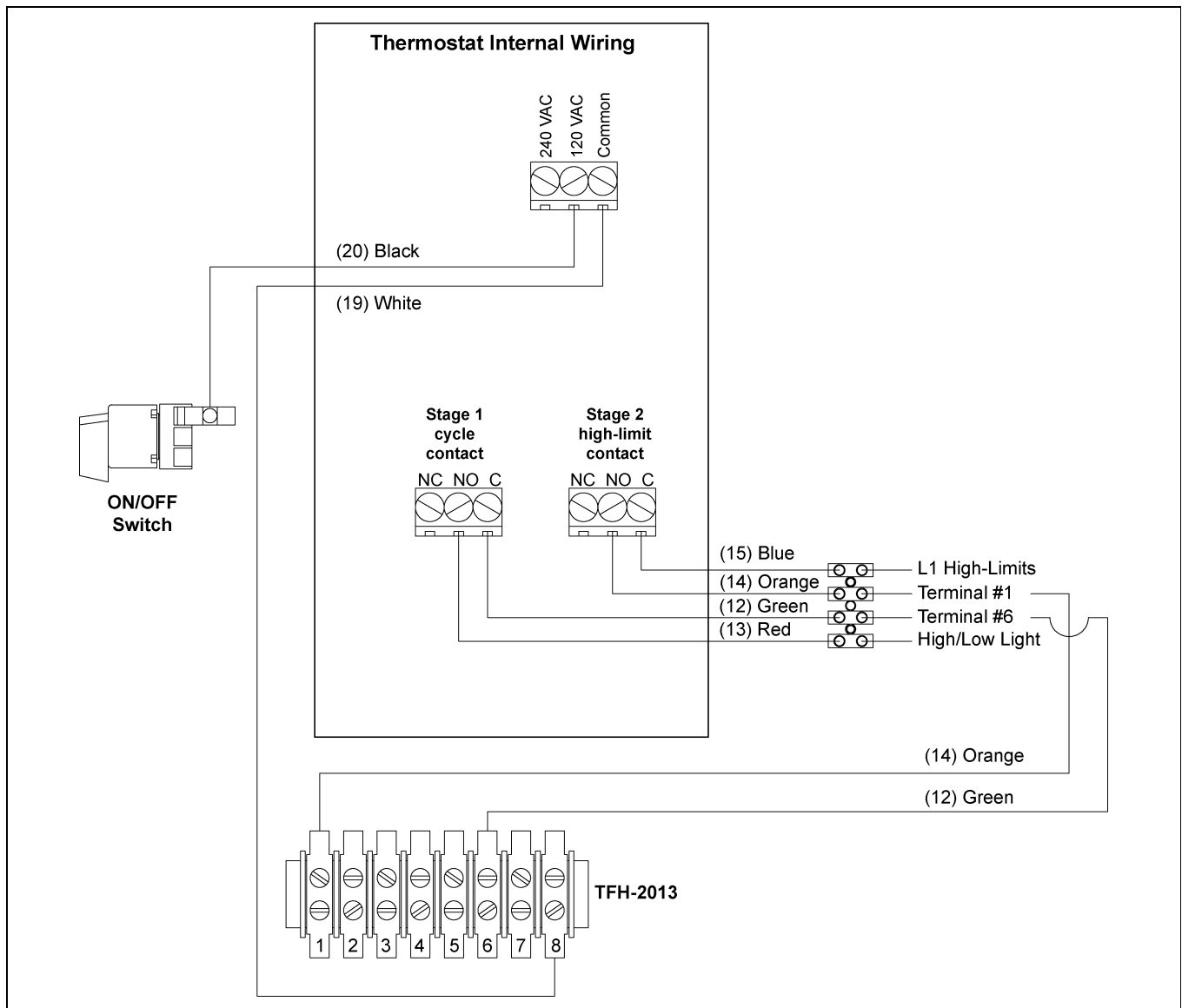


Figure 4B Heaters Built in 2007 using HH-1089E Time Delay

## Thermostat Connection to Deluxe Heater Control

### Thermostat Connection to HF-7318-1 Circuit Board

1. Connect power cord to fan control box.
2. Connect the BLACK 120 VAC power wire to terminal 20.
3. Connect the WHITE Neutral wire to terminal 19.
4. Connect the BLUE Stage 2 Common wire to terminal 15.
5. Connect the ORANGE Stage 2 N/O wire to terminal 14.
6. Connect the RED Stage 1 N/O wire to terminal 13.
7. Connect the GREEN Stage 1 Common wire to terminal 12.

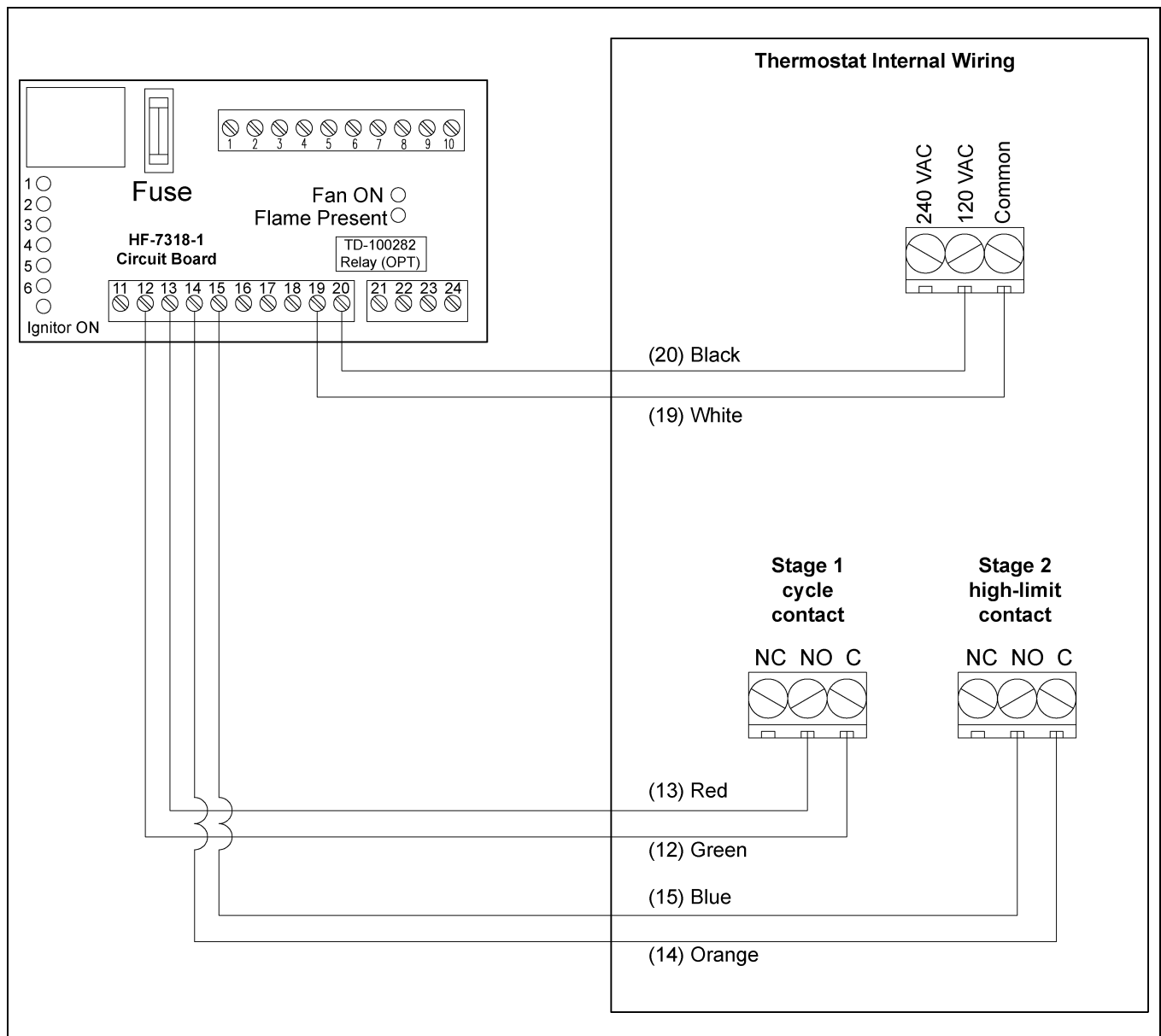


Figure 4C

## 5. Programming

### Programming Set Point Values

Programming can be done anytime that the thermostat control is receiving power, even when the heater is in operation.

1. Press the SET key once to set temperature scale mode. Use the UP or DOWN arrow key to toggle between F for degrees Fahrenheit or C for degrees Celsius.
2. Press the SET key again to access the Stage 1 set point. "S1" will blink on the screen. Press the UP arrow to increase or the DOWN arrow to decrease the set point to the desired temperature.

**Cycle Set Point** - *If the plenum temperature increases above this point, the flame is reduced to "Low Flame".*

3. Press the SET key again to access the Stage 1 differential. "DIF1" will blink on the screen. Press the UP arrow to increase or the DOWN arrow to decrease the differential to the desired setting.

**Temperature Differential 1** - *If the flame shuts off because the temperature is greater than the Cycle Set Point, then the temperature must fall below (Set Point minus Temperature Differential) for the flame to come back ON. Heater will resume high flame operation.*

4. Press the SET key again to access the Stage 1 heating. "H1" should appear on the screen. This must read "H1" for the heater to operate correctly. If not, use the arrow keys to scroll through the values until the screen reads "H1".
5. Press the SET key again to access the Stage 2 setpoint. "S2" will blink on the screen. Press the UP arrow to increase or the DOWN arrow to decrease the set point to the desired temperature.

**High Limit Set Point** - *If the plenum temperature increases above this point, the flame is shut off - "OFF Cycle".*

6. Press the SET key again to access Stage 2 differential. "DIF2" will flash on the screen. Press the UP arrow to increase or the DOWN arrow to decrease the differential to the desired setting.

**Temperature Differential 2** - *If the flame shuts off because the temperature is greater than the High Limit Set Point, then the temperature must fall below (Set Point minus Temperature Differential) for the flame to come back ON. Heater will resume low flame operation.*

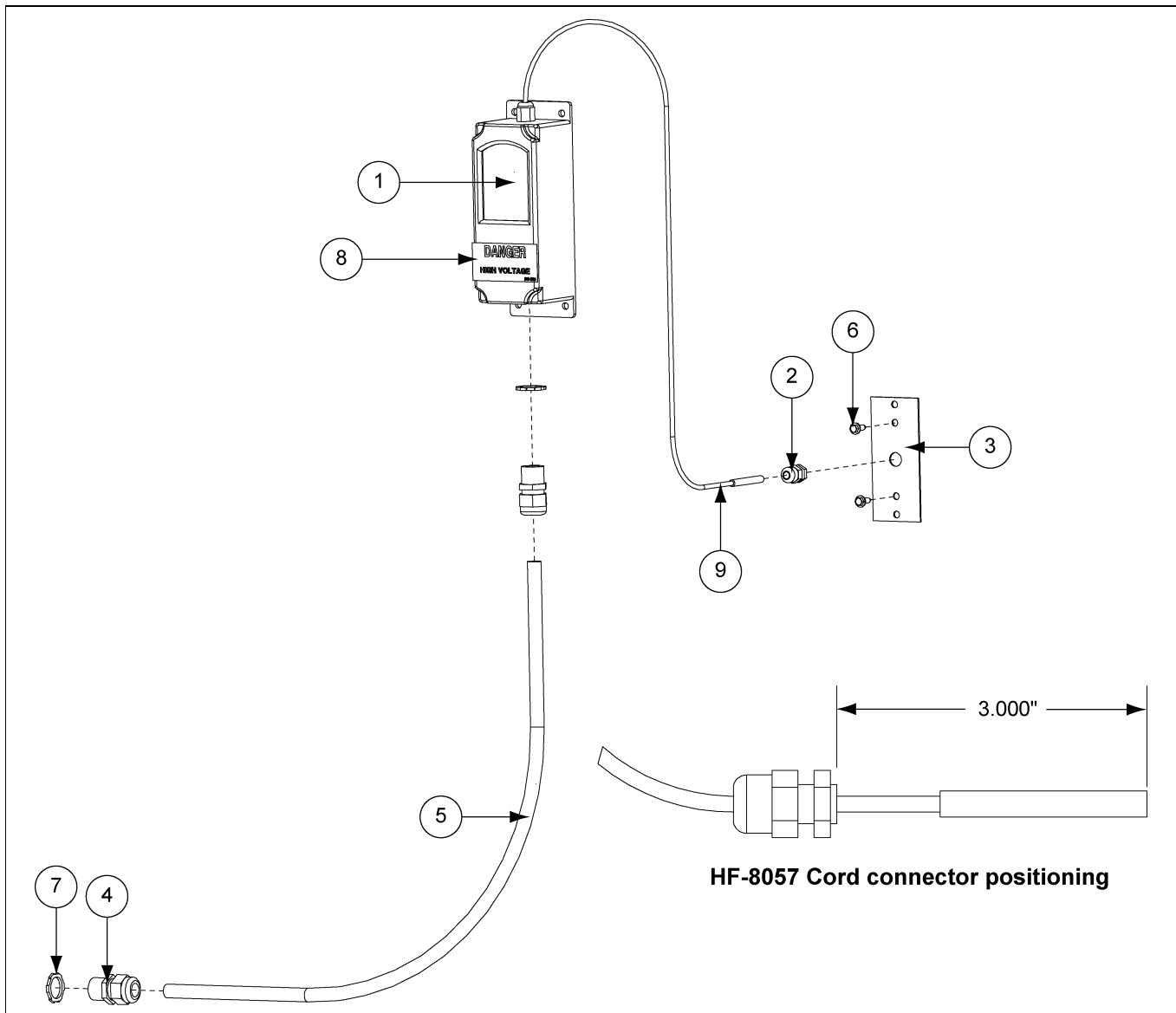
7. Press the SET key again to access Stage 2 heating. "H2" should appear on the screen. This must read "H2" for the heater to operate correctly. If not, use the arrow keys to scroll through the values until the screen reads "H2".
8. Press the SET key again. This will end programming.

The Thermostat Control will automatically end programming if no keys are pressed for a period of 30 seconds. Any settings that have been input to the control will be accepted at that point.

All control settings are retained in memory. Re-programming is not necessary after power outages or disconnects unless different control settings are required.

The temperature differentials can be set from 1-30°. It is recommended that these temperature differentials be set in the range of 10-15 °F for high temperature units and 1-5 °F for low temperature units.

## Thermostat Assembly High-Low 2 Stage Digital (HF-8056)



Ref #	Part #	Description	Qty
1	HF-8055	Thermostat, 2 Stage Digital	1
2	HF-8057	Connector, Straight Cord Grip Heyco #M3444 with Nylon Nut	1
3	HF-8058	Sensor Mounting Plate	1
4	FH-1310	Connector, Cord Heyco #3231	2
5	WR-186SEOW	Cable, Wire CLM 18/6 SEOW Control	1
6	S-280	Screw, SDS #10-16 x 5/8" Hardware ZN	6
7	FH-1309	Nut, Lock 1/2" with Pipe Threads	2
8	DC-889	Decal, Danger High Voltage	1
9	HF-8117	Thermistor Sensor - Replacement Only	1

## 7. Appendix

**NOTE:** Refer to Documentation provided by component manufacturer for troubleshooting and maintenance of the Thermostat Control including sensor data.  
Form No. 7515006-001 Rev A.

### Troubleshooting Error Messages

<b>E1</b>	Appears when either the up arrow or down arrow key is pressed when not in the programming mode. <b>To Correct:</b> If the E1 message appears even when no keys are being pressed, replace the control.
<b>E2</b>	Appears if the control settings are not properly stored in memory. <b>To Correct:</b> Check all settings and correct if necessary.
<b>EP</b>	Appears when the probe is open, shorted or sensing a temperature that is out of range. <b>To Correct:</b> Check to see if the temperature is out of range. If not, check the probe for damage by comparing it to a known ambient temperature between -30°F and 220°F. Replace the probe if necessary.
<b>EE</b>	Appears if the EEPROM data has been corrupted. <b>To Correct:</b> This condition cannot be field repaired. Replace the control.
<b>CL</b>	Appears if calibration mode has been entered. <b>To Correct:</b> Remove power to the control for at least 5 seconds. Re-apply power. If the <b>CL</b> message still appears, replace the control.



## GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

### Warranty Extensions:

The Limited Warranty period is extended for the following products:

	Product	Warranty Period	
<b>AP Fans and Flooring</b>	Performer Series Direct Drive Fan Motor	3 Years	* Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 25% 5 to 7 years - end-user pays 50% 7 to 10 years - end-user pays 75%
	All Fiberglass Housings	Lifetime	
	All Fiberglass Propellers	Lifetime	
<b>AP and Cumberland</b>	Flex-Flo/Pan Feeding System Motors	2 Years	
<b>Cumberland Feeding/Watering Systems</b>	Feeder System Pan Assemblies	5 Years **	** Warranty prorated from list price: 0 to 3 years - no cost to end-user 3 to 5 years - end-user pays 50%
	Feed Tubes (1-3/4" and 2.00")	10 Years *	
	Centerless Augers	10 Years *	
	Watering Nipples	10 Years *	
<b>Grain Systems</b>	Grain Bin Structural Design	5 Years	
<b>Grain Systems Farm Fans Zimmerman</b>	Portable and Tower Dryers	2 Years	† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.
	Portable and Tower Dryer Frames and Internal Infrastructure †	5 Years	

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12<sup>th</sup>) month from the date of purchase and continuing until the sixtieth (60<sup>th</sup>) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

### Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) PRODUCT MANUFACTURED OR SOLD BY GSI OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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