



Humidistat-Thermostat

Model # HF _ _ _ _ _

Owner's Manual

PNEG-236

Date: 12-02-09

GSI GROUP



PNEG-236

Contents

Chapter 1 Safety	4
Safety Guidelines	4
Humidistat-Thermostat Operation	5
Chapter 2 Safety Alert Decals	6
Chapter 3 General Installation	9
Installation Instructions	9
Chapter 4 Installation of Top Dry High-Low Thermostat	10
Installation Instructions	10
Chapter 5 Operation	11
Temperature Control	11
Humidity Control	11
Chapter 6 Operation and Service	12
High-Low Temperature Control	12
Humidistat-Thermostat Service	12
Chapter 7 Parts List	13
Humidistat-Thermostat Parts	13
Low-Temperature Humidistat-Thermostat Parts	14
High-Low Humidistat-Thermostat Parts	15
Chapter 8 Wiring Diagrams	16
Humidistat-Thermostat Wiring	16
Thermostat Wiring	17
Humidistat Wiring	18
High-Low Thermostat Wiring	19
Chapter 9 Mounting Template	20
Chapter 10 Warranty	21

Safety Guidelines

This manual contains information that is important for you, the owner/operator, to know and understand. This information relates to protecting **personal safety** and **preventing equipment problems**. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidelines. To help you recognize this information, we use the symbols that are defined below. Please read the manual and pay attention to these sections. Failure to read this manual and its safety instructions is a misuse of the equipment and may lead to serious injury or death.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



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



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



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



CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



NOTE indicates information about the equipment that you should pay special attention.



WARNING! BE ALERT!

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

Humidistat-Thermostat Operation

Thank you for choosing a GSI product. It is designed to give excellent performance and service for many years.

Our foremost concern is your safety and the safety of others associated with this equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist, and to inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation where **SERIOUS INJURY** or **DEATH** may occur.

2. Safety Alert Decals

The GSI Group recommends contacting your local power company, and having a representative survey the installation so the wiring is compatible with their system, and adequate power is supplied to the unit.

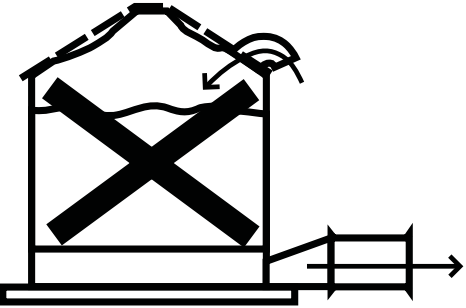
Safety decals should be read and understood by all people in the grain handling area. If a decal is damaged or missing, contact:

GSI Decals

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

A free replacement will be sent to you.

Roof Damage Warning and Disclaimer

<p>! CAUTION!</p>  <p>Excessive vacuum (or pressure) may damage roof. Use positive aeration system. Make sure all roof vents are open and unobstructed. Start roof fans when supply fans are started. Do not operate when conditions exist that may cause roof vent icing.</p> <p>DC-969</p>	<p>GSI does not warrant any roof damage caused by excessive vacuum or internal pressure from fans or other air moving systems. Adequate ventilation and/or "Makeup Air" devices should be provided for all powered air handling systems. GSI 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.</p>
--	---

ATTENTION: The decal shown below should be present on the outside of the door cover of the 2 ring, 24" porthole door cover and the roof manway cover.



DANGER

 <p>Rotating flighting will kill or dismember.</p>	 <p>Flowing material will trap and suffocate.</p>	 <p>Crusted material will collapse and suffocate.</p>
--	---	---

Keep clear of all augers. DO NOT ENTER this bin!

If you must enter the bin:

1. Shut off and lock out all power.
2. Use a safety harness and safety line.
3. Station another person outside the bin.
4. Avoid the center of the bin.
5. Wear proper breathing equipment or respirator.

Failure to heed these warnings will result in serious injury or death.

DC-GBC-1A

⚠ DANGER



HIGH VOLTAGE.

- Will cause serious injury or death.
- Lockout power before servicing.

DC-1224



⚠ WARNING

Flame and pressure beyond door can cause serious injury. Do not operate with service door removed. Keep head and hands clear.

DC-1227



⚠ WARNING

Stay clear of rotating blade. Blade could start automatically. Can cause serious injury. Disconnect power before servicing.

DC-1225

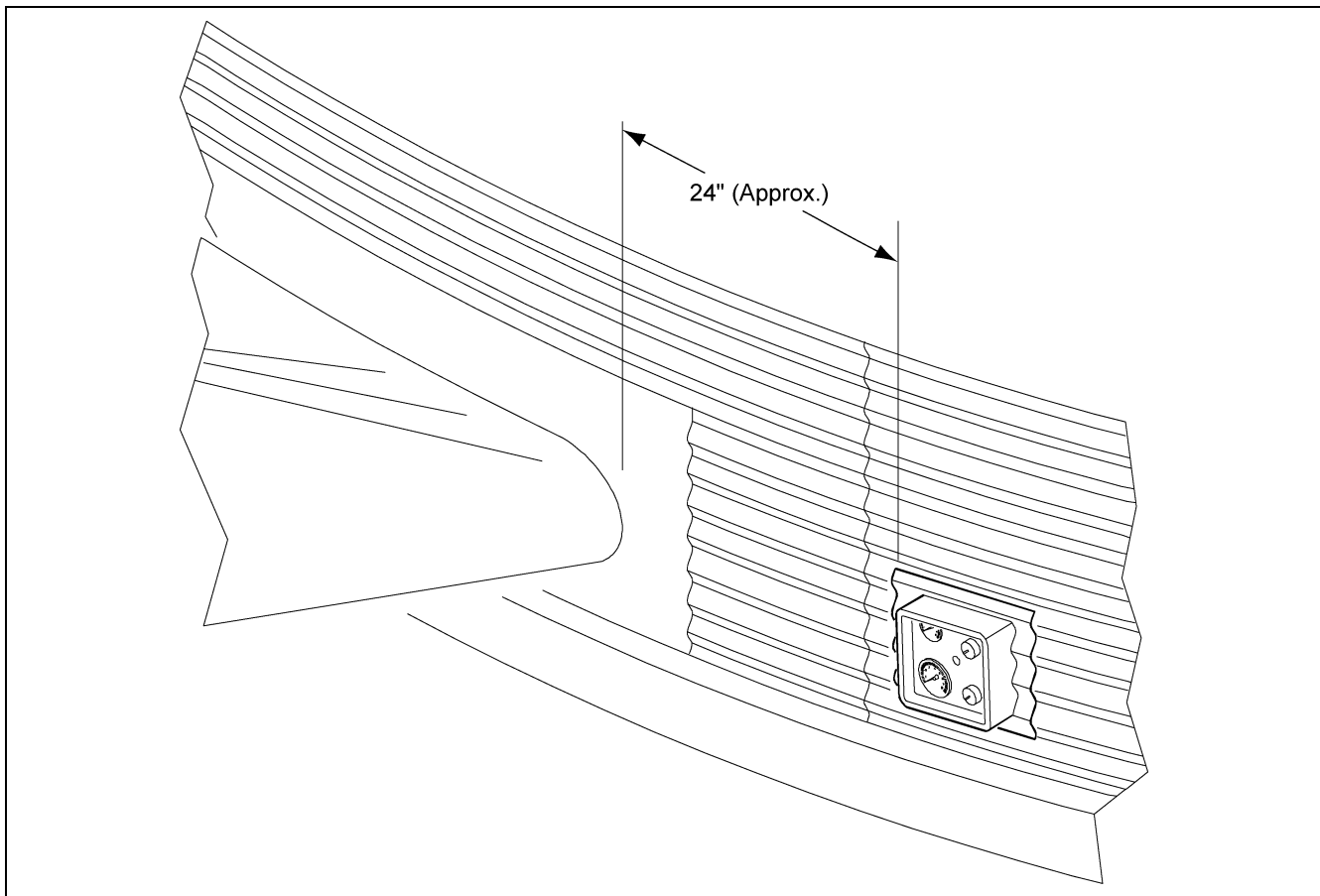


Figure 3A 24" is the approximate distance from the edge of the transition to the edge of the humidistat installation.

Installation Instructions

Standard electrical safety practices and codes should be used when installing the Humidistat-Thermostat. 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.

1. The Humidistat-Thermostat should be mounted on the side of the bin wall between the foundation and the drying floor. It should be installed approximately 24" from the right side of the transition as shown in [Figure 3A](#).
2. Use the template [on Page 20](#). With these instructions, drill only the holes necessary for the particular model. (**NOTE:** *For humidistat to operate properly optional cutout must be used.*)
3. Caulk the top and sides of the plastic housing using roll caulking supplied with the unit. Do not caulk the bottom side of housing so moisture can escape.
4. Carefully insert sensing probes through bin wall and secure housing to wall using self-drilling screws provided. Be careful not to overtighten screws. Damage to housing could result.
5. Make wiring connections to heater as shown in heater Owner's manual.

4. Installation of Top Dry High-Low Thermostat

The High-Low thermostat is designed for use with the GSI top dry crop dryer units. It comes with one thermostat which is adjustable and cycles the heater from high to low flame. The High-Low thermostat also comes with a thermometer for monitoring the plenum temperature.

Installation Instructions

1. Locate the mounting position of the thermostat as shown in [Figure 4A](#).
2. Use the template [on Page 20](#). With these instructions, drill only the holes necessary for the particular model.
3. Apply rope caulk to sides and top of plastic housing. Leave bottom open to let moisture escape.
4. Secure housing to sidewall using self-drilling screws supplied. Be careful not to overtighten. Overtightening may cause the housing to crack.
5. Connect the black and white wires to the terminals marked bin High-Limit (3rd and 4th terminal bottom left hand terminal strip) on fan and heater safety circuit board.
6. Connect the green and red wires to the terminals marked cycle (8th and 6th terminal bottom left hand terminal strip) on fan and heater safety circuit board.

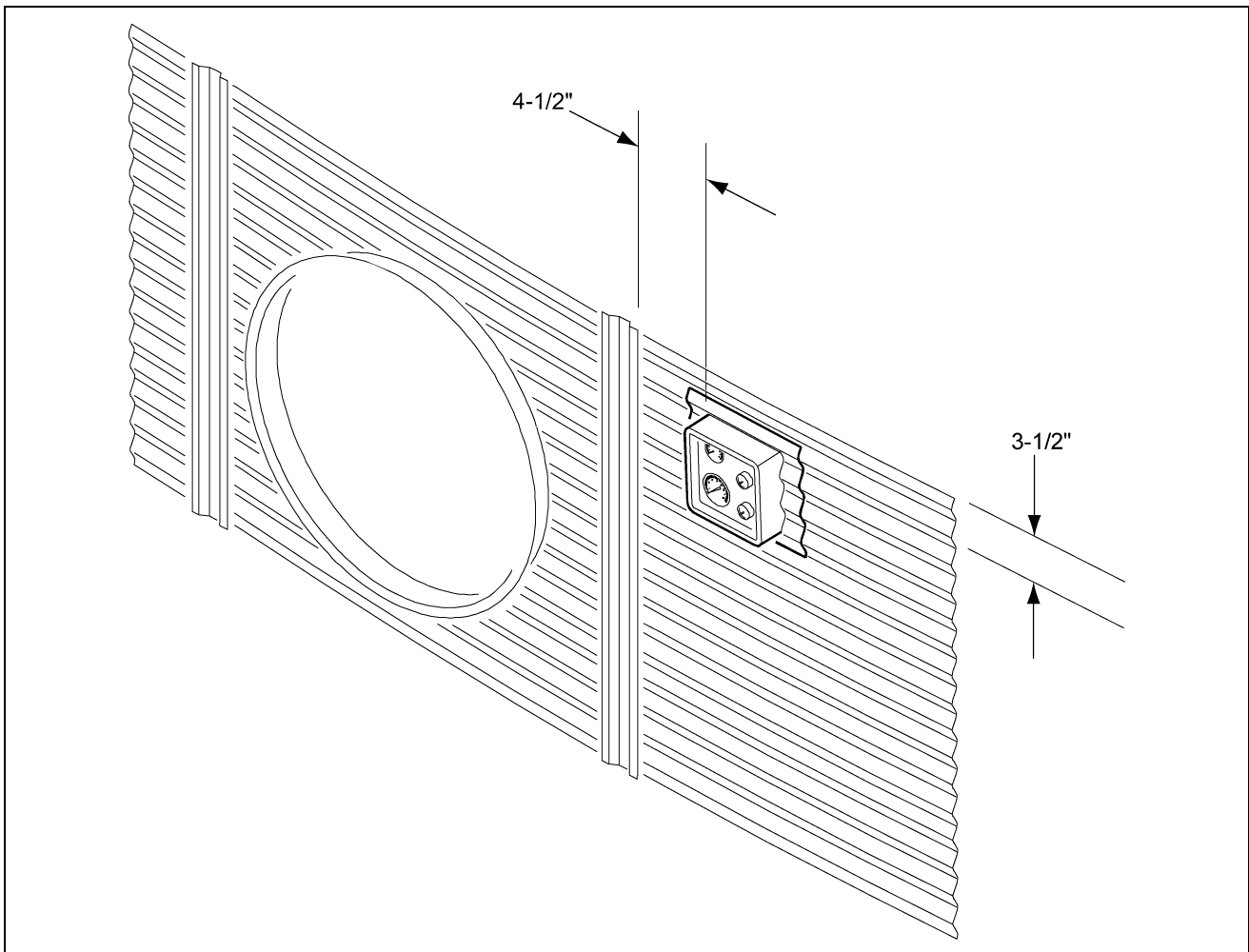


Figure 4A Placement of the Top Dry High-Low Thermostat

Temperature Control

1. Turn the fan unit ON and let it run 3 to 5 minutes to equalize temperature under the bin.
2. Set bypass switch to the “HUMIDISTAT OFF” position. This setting allows the unit to run based on temperature only.
3. Rotate the thermostat knob clockwise to the warmest position.
4. Open the gas valves to the heater and turn the heater ON. Set heater gas pressure to a moderately high setting (5 to 10 PSI).
5. Monitor the thermometer on the thermostat housing. When the thermometer comes up to the desired temperature, slowly turn the thermostat knob counterclockwise until the heater cycles OFF.
6. If the unit does not reach the desired temperature, gradually increase the gas pressure until the temperature rises to the desired level.
7. Watch the unit run through several cycles and make any final adjustments. (**NOTE:** *The unit should be on approximately 80% of the time. If not adjust gas pressure.*)
8. Significant changes in outside air temperature may require readjustment of gas pressure.

Humidity Control

1. Set bypass switch to the “HUMIDISTAT ON” position. This setting allows the unit to run based on temperature and humidity.
2. Set the thermostat (Humidistat-Thermostat units only) to the maximum temperature desired. This allows the thermostat to function as a High-Limit control only. See the above [Temperature Control](#) for setting the thermostat.
3. Set the humidistat to the desired relative humidity level you want to maintain under the drying floor. The heater will cycle on above this relative humidity, and OFF when this level is reached.
4. Use the equilibrium moisture chart below as a guide for setting the humidistat.

Equilibrium Moisture Chart (Shelled Corn)

Air Temperature (F)	Relative Humidity - Percentage (%)													
	35	40	45	50	55	60	65	70	75	80	85	90	95	100
20°	11.2	11.7	12.7	13.7	14.5	15.1	16.2	17.1	18.0	19.6	21.2	23.5	25.8	29.1
30°	10.8	11.3	12.2	13.1	13.9	14.6	15.5	16.4	17.4	18.7	20.2	22.5	25.0	28.3
40°	10.5	11.0	11.7	12.5	13.3	14.0	14.8	15.5	16.6	17.8	19.4	21.5	24.2	27.5
50°	10.1	10.6	11.3	12.0	12.7	13.3	14.1	14.8	15.8	16.9	18.6	20.5	23.4	26.7
60°	9.7	10.2	10.9	11.6	12.1	12.7	13.4	14.2	15.0	16.0	17.8	19.5	22.6	25.9
70°	9.0	9.7	10.4	11.1	11.5	12.0	12.8	13.5	14.5	15.4	16.8	18.5	21.3	24.5
80°	8.3	9.1	9.8	10.5	10.8	11.2	12.1	13.0	13.9	14.8	15.8	17.4	20.0	22.8

Boxed area indicates safe moisture for normal winter storage of shelled corn at 15%. Grain to be stored through the summer or long term, needs to be 1 to 3 points dryer.

High-Low Temperature Control

1. Turn fan unit ON and let it run 3 to 5 minutes to equalize temperature under the bin.
2. Rotate the thermostat knob clockwise to warmest position.
3. Open gas valves (including Low-Fire valve) to the heater and turn the heater ON. Set heater gas pressure to a moderately high setting (5 to 10 PSI).
4. Monitor the thermometer on the thermostat housing. When the thermostat comes up to desired temperature, slowly turn the most at knob counterclockwise until heater cycles to Low-Flame.
5. If the unit does not reach desired temperature, gradually increase the gas pressure until the temperature rises to desired level.
6. Adjust the Low-Fire valve so that the temperature drops until the unit cycles back to High-Flame.
7. Watch the unit run through several cycles and make any final adjustments. (**NOTE:** *The unit should cycle approximately two (2) times per minute. If not adjust gas pressure.*)
8. Significant changes in outside air temperature may require readjustment of gas pressure.

NOTE: *If temperature of Low-Flame exceeds thermostat settings (above normal outside temperatures) unit will cycle from Low-Flame to OFF. (Top dry units will shut down completely.)*

Humidistat-Thermostat Service

GSI thermostats are designed and built to withstand the harsh conditions usually found in drying bins. A yearly preventative maintenance inspection may extend the life of the heating controls many years.



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

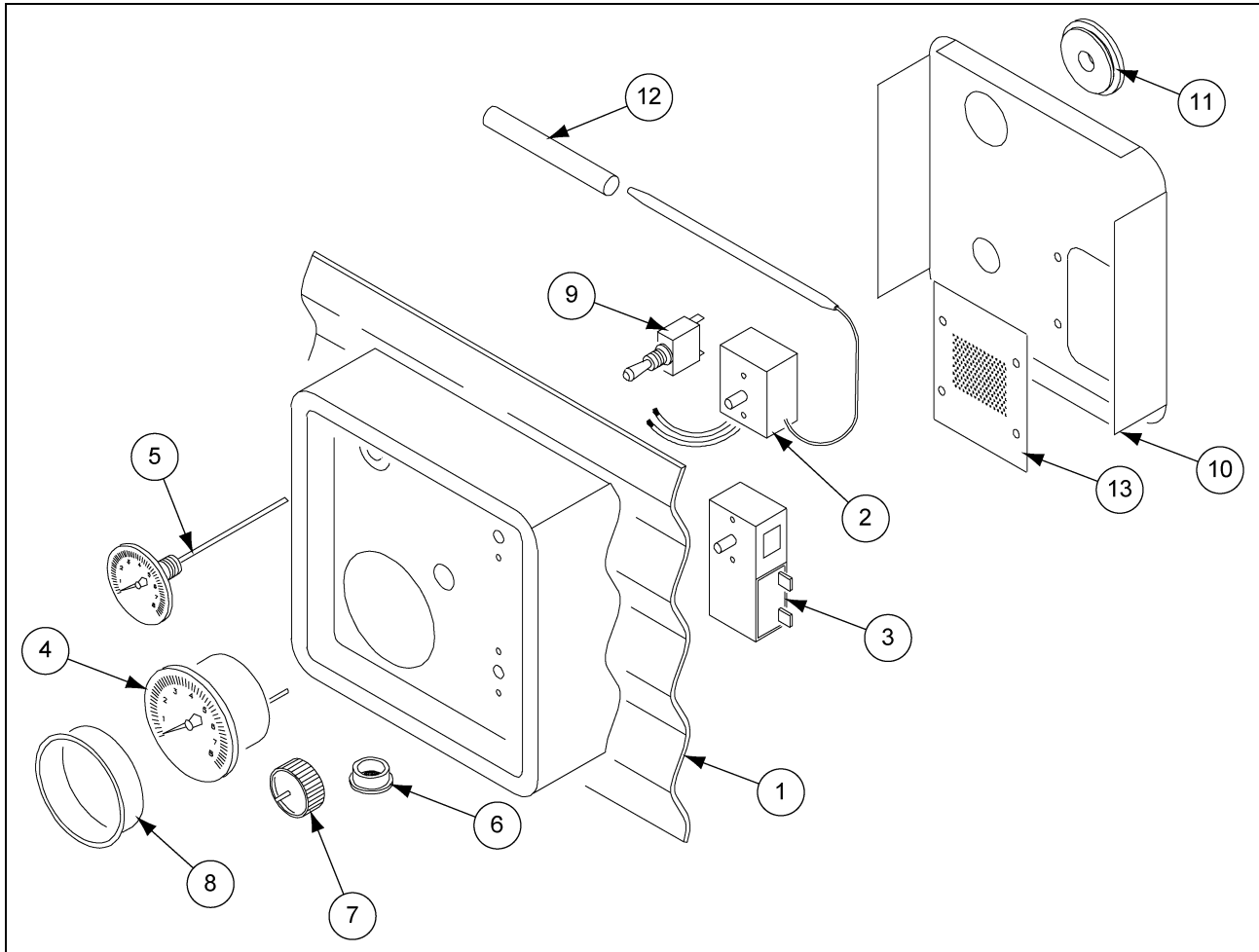
1. Remove mounting screws from the thermostat housing and remove the housing from the bin wall.
2. Carefully remove the back panel from the housing. (It may be necessary to cut caulking.)
3. Blow out any dust or dirt that may have collected inside the housing.
4. Inspect the wiring for any loose connections, or rodent and insect damage.
5. Replace the back panel and caulk the corners to help seal the unit.
6. Reinstall the unit on the bin wall.



The Airstream Humidistat-Thermostat is mounted on the lower right side of the grain bin's transition. This allows for easy service and operation.

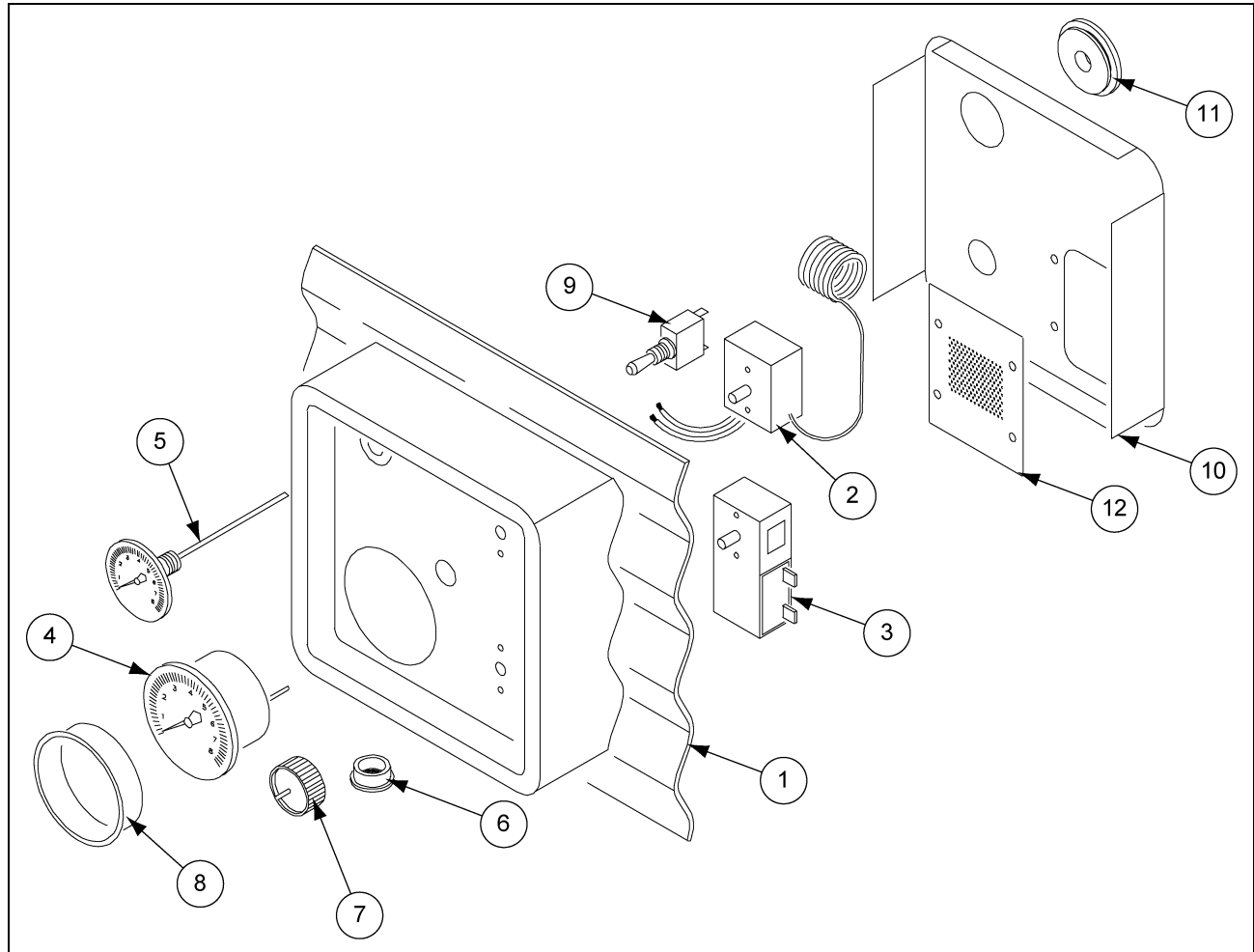
Figure 6A

Humidistat-Thermostat Parts



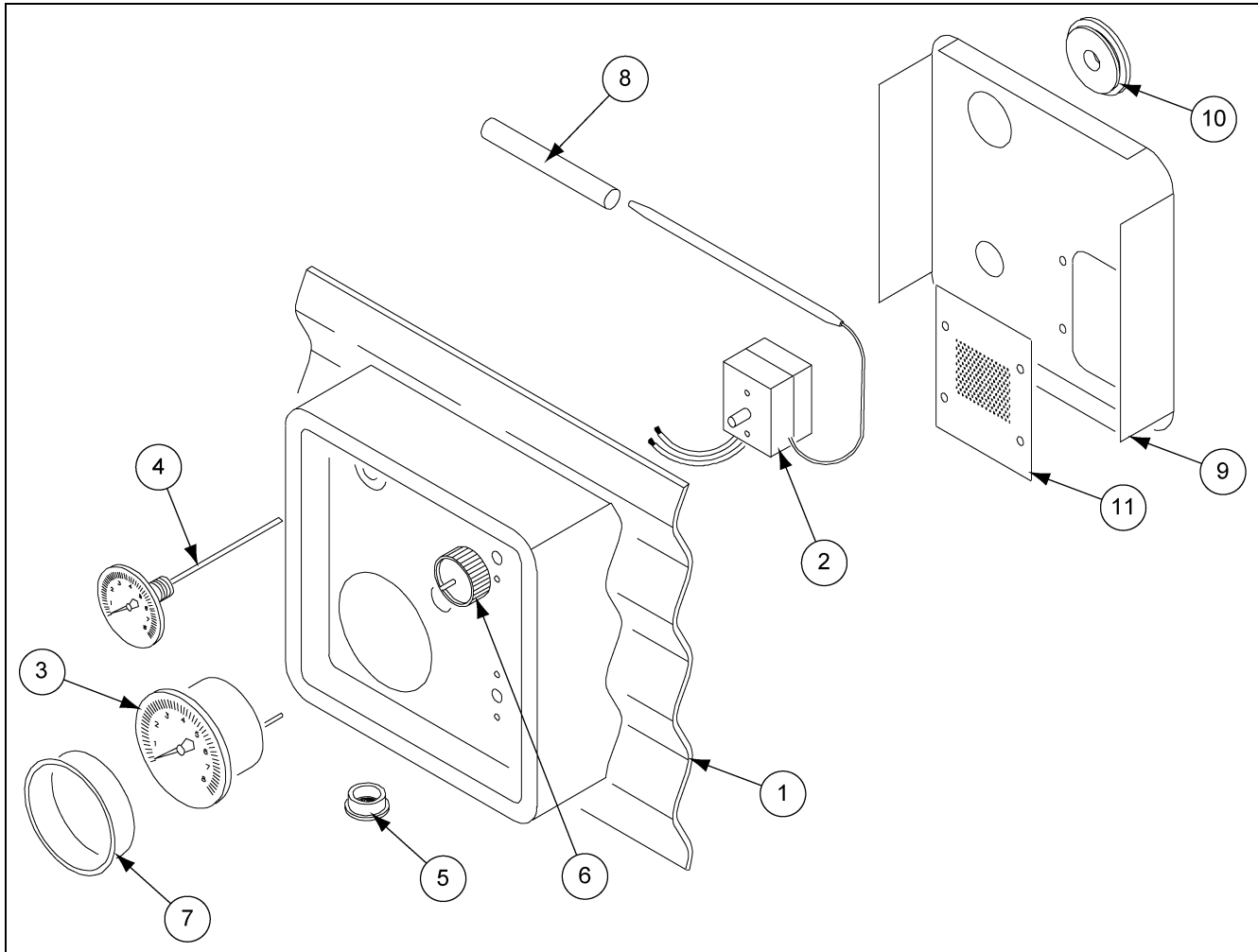
Ref #	Part #	Description
1	HF-1431	2.66" Plastic Housing
1	HF-1446	4.00" Plastic Housing
2	HF-1432	Thermostat
3	HF-1433	Humidistat
4	HF-1434	Static Pressure Gauge
5	HH-1435	220° Thermometer
6	HH-1436	Screen Plug
7	HH-1970	Plastic Knob
8	HH-2089	Large Red Plastic Plug
9	HH-1442	Toggle Switch
10	HF-7108	Thermostat Cover
11	HH-7032	Rubber Grommet
12	HH-7029	Heat Shrink Tube 1/2"
13	HF-7110	Humidistat Cover

Low-Temperature Humidistat-Thermostat Parts



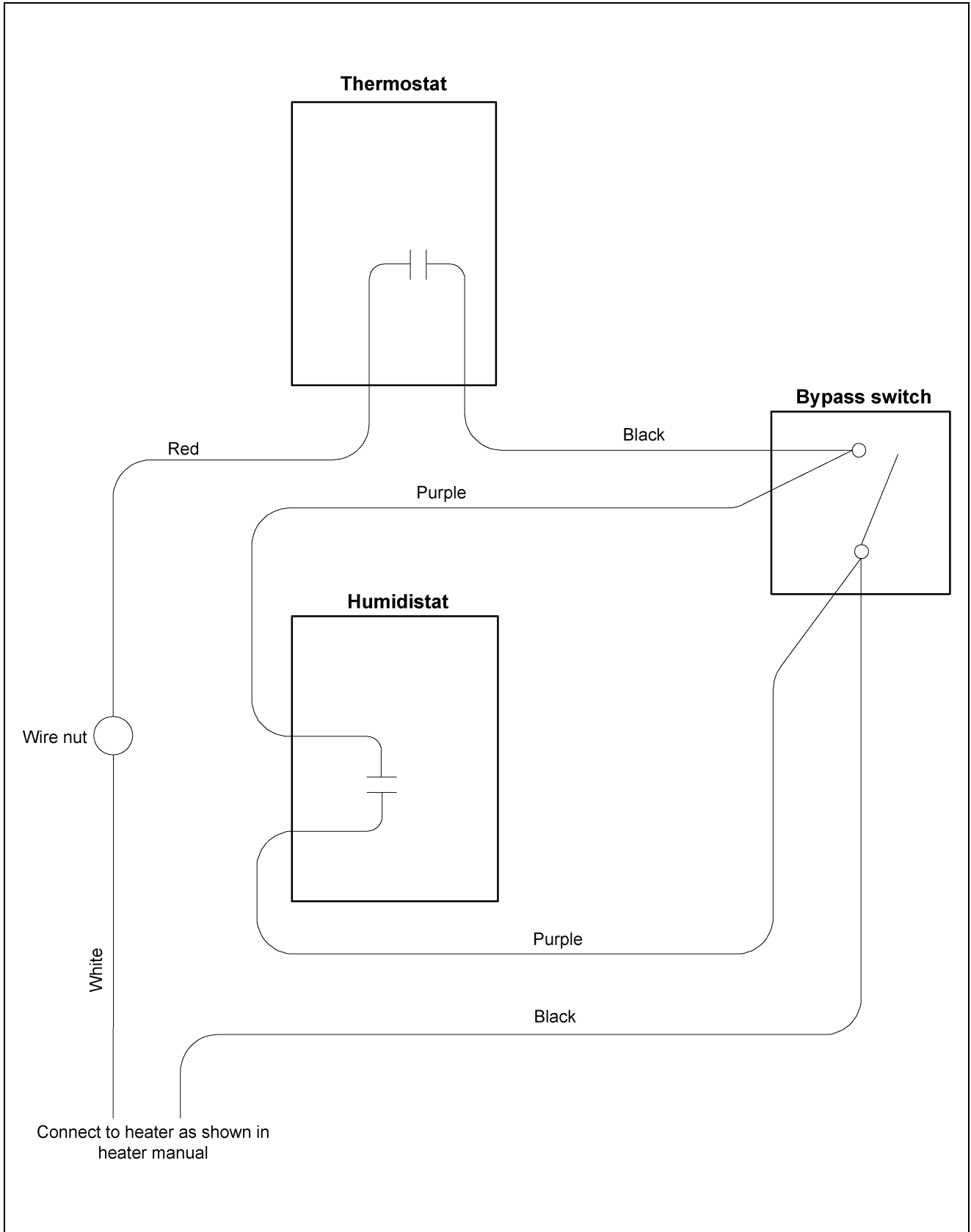
Ref #	Part #	Description
1	HF-1431	2.66" Plastic Housing
1	HF-1446	4.00" Plastic Housing
2	HF-3974	Low-Temperature Thermostat
3	HF-1433	Humidistat
4	HF-1434	Static Pressure Gauge
5	HH-3973	140° Thermometer
6	HH-1436	Screen Plug
7	HH-1970	Plastic Knob
8	HH-2089	Large Red Plastic Plug
9	HH-1442	Toggle Switch
10	HF-7108	Thermostat Cover
11	HH-7032	Rubber Grommet
12	HF-7110	Humidistat Cover

High-Low Humidistat-Thermostat Parts

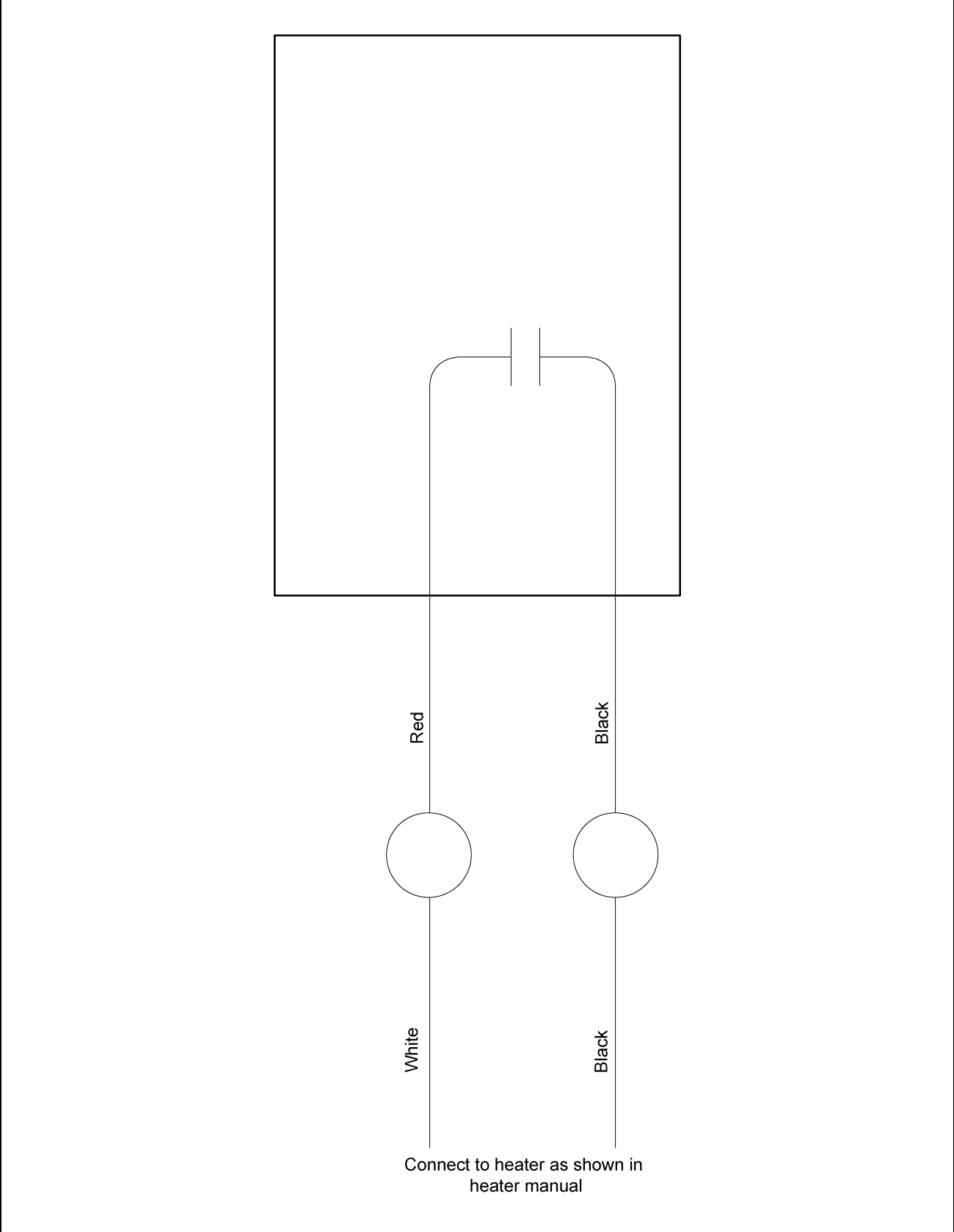


Ref #	Part #	Description
1	HF-1431	2.66" Plastic Housing
1	HF-1446	4.00" Plastic Housing
2	HF-7028	Low-Temperature Thermostat
3	HF-1434	Static Pressure Gauge
4	HF-1435	220° Thermometer
5	HH-1436	Screen Plug
6	HH-1970	Plastic Knob
7	HH-2089	Large Red Plastic Plug
8	HH-7029	Heat Shrink Tube 1/2"
9	HH-7108	Thermostat Cover
10	HF-7032	Rubber Grommet
11	HF-7110	Humidistat Cover

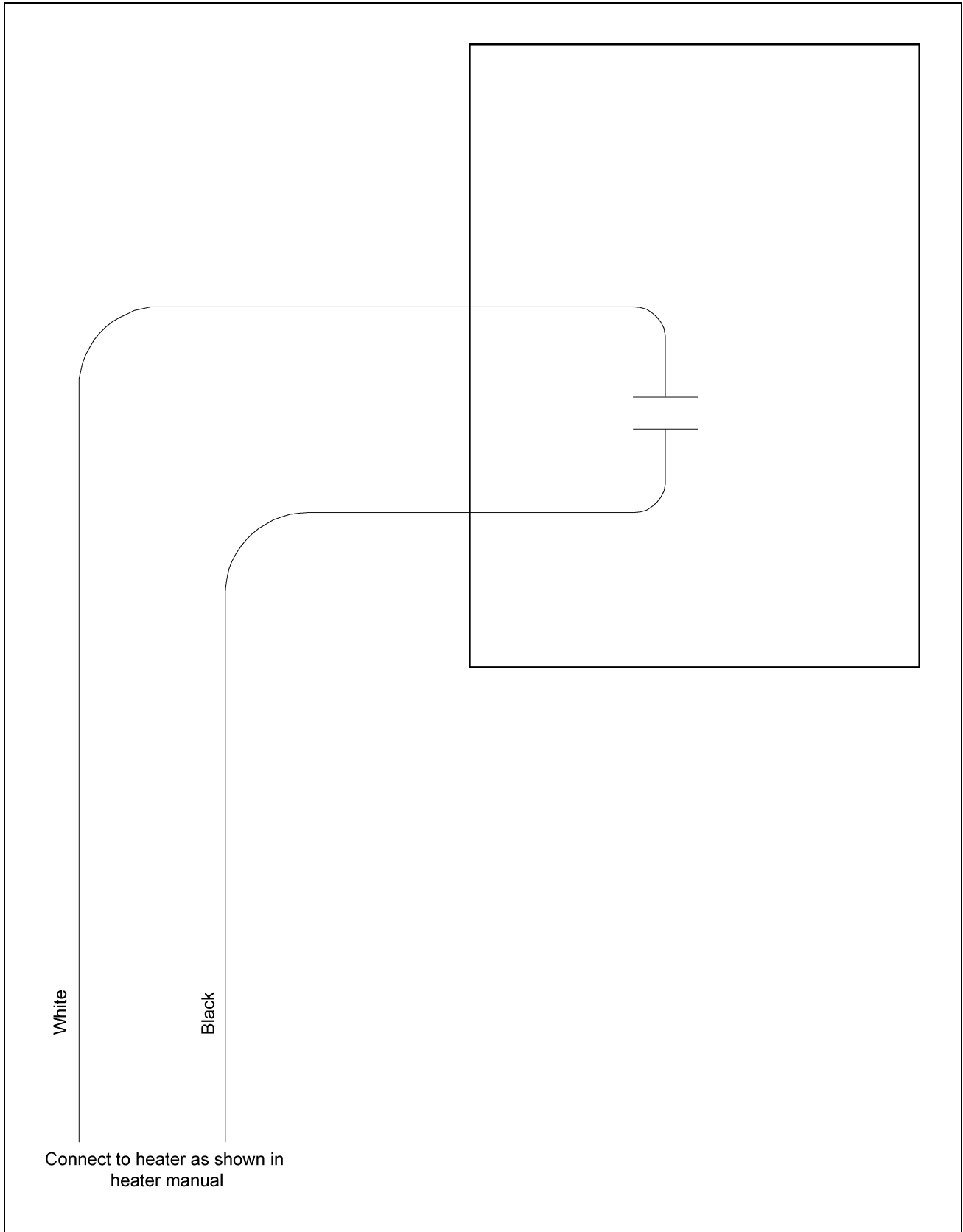
Humidistat-Thermostat Wiring



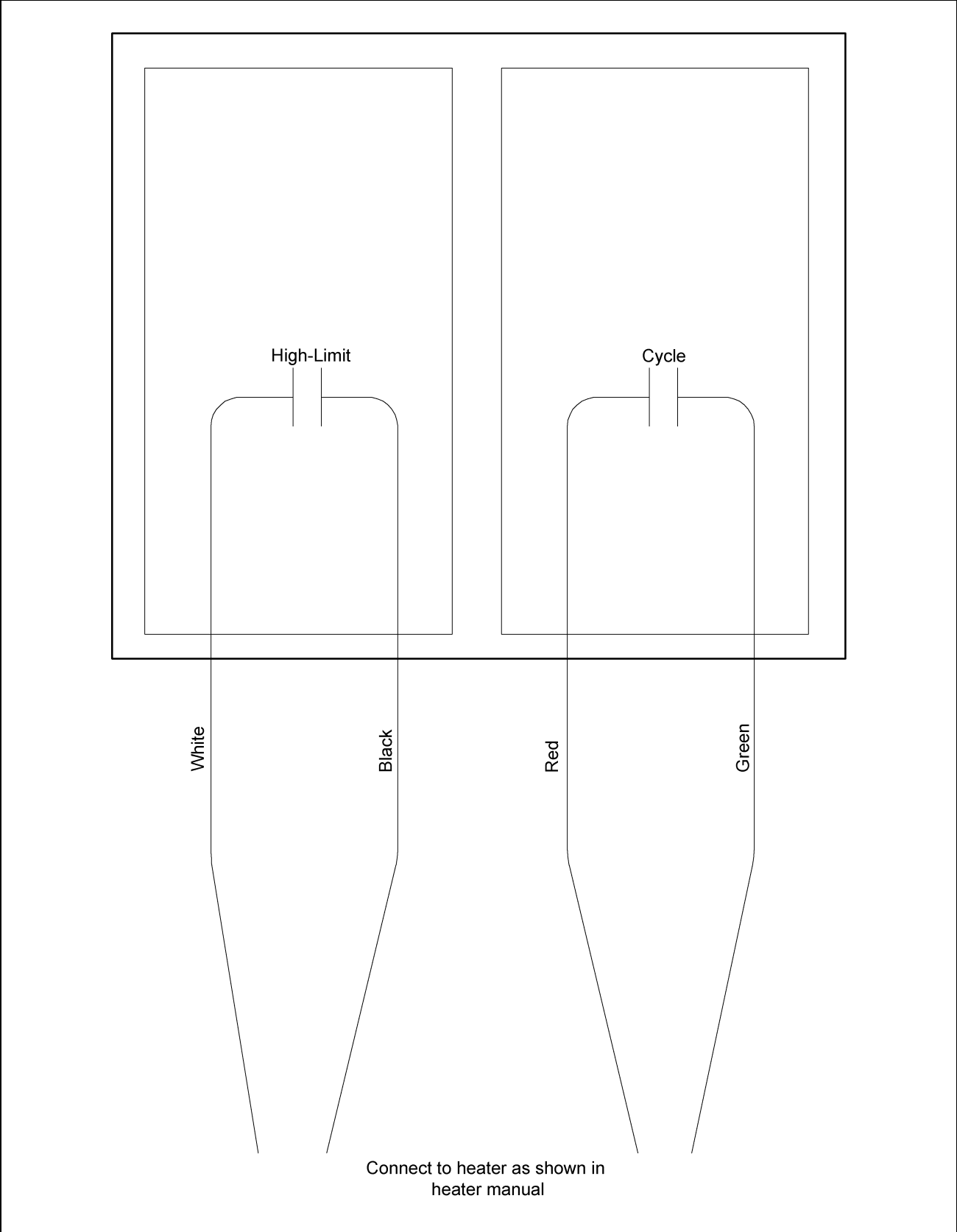
Thermostat Wiring



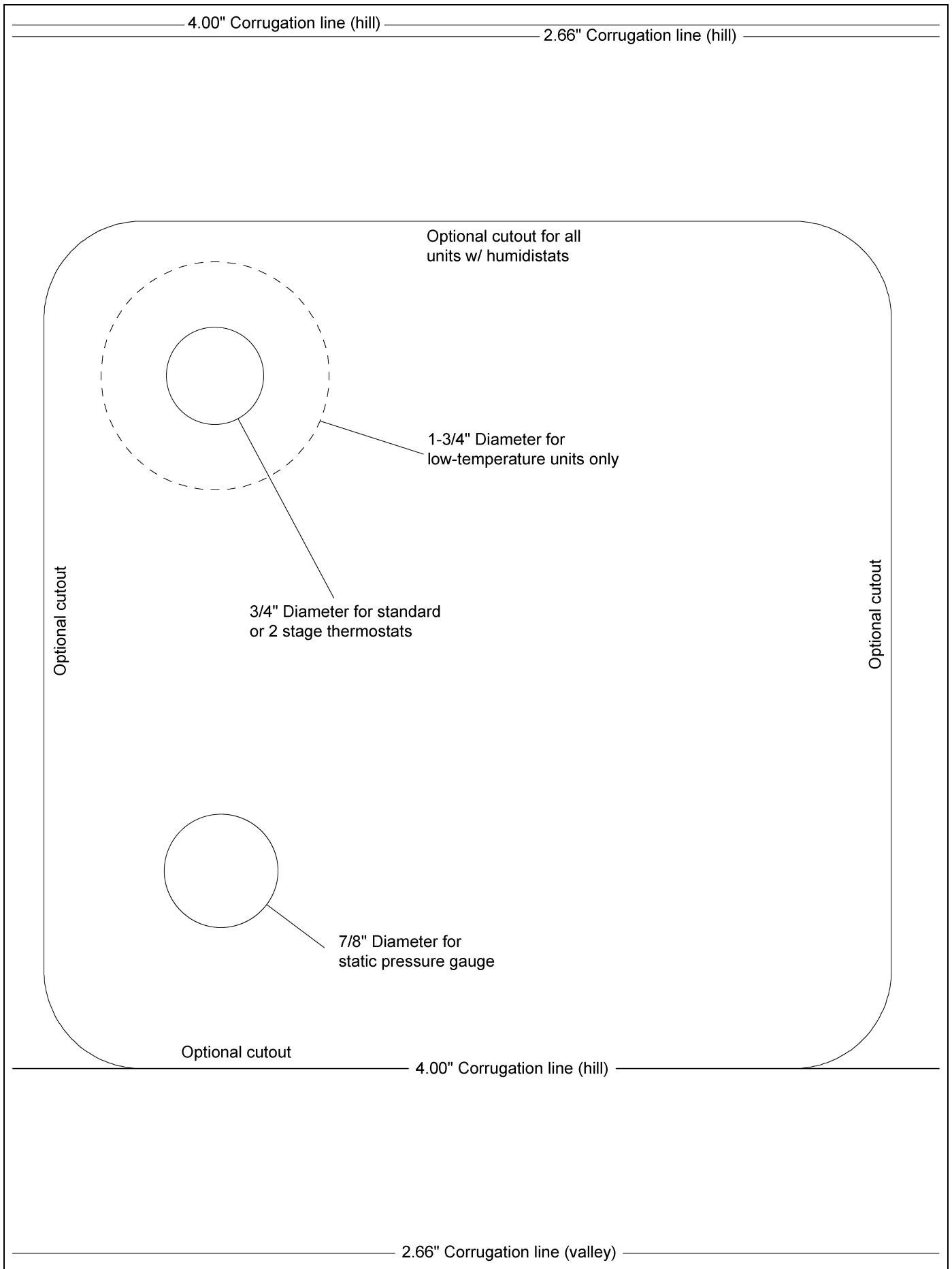
Humidistat Wiring



High-Low Thermostat Wiring



9. Mounting Template



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	
AP Fans and Flooring	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	
Cumberland Feeding/Watering Systems	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 *	
Grain Systems	Grain Bin Structural Design	5 Years	
Grain Systems Farm Fans Zimmerman	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 (12th) month from the date of purchase and continuing until the sixtieth (60th) 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.

G S I G R O U P



GSI Group
1004 E. Illinois St.
Assumption, IL 62510-0020
Phone: 1-217-226-4421
Fax: 1-217-226-4420
www.gsiag.com