



## Humidistat-Thermostat

Model # HF \_ \_ \_ \_ \_

Owner's Manual

PNEG-236

Date: **09-20-20**

GSI GROUP



PNEG-236



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### 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.

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## 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.

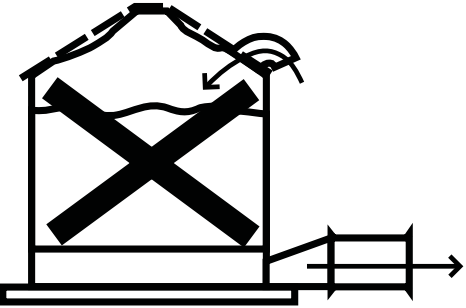
Safety decals should be read and understood by all people in the grain handling area. If a decal is damaged or missing, contact:

### **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><b>! CAUTION!</b></p>  <p><b>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.</b></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>
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**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><b>Rotating flighting will kill or dismember.</b></p>	 <p><b>Flowing material will trap and suffocate.</b></p>	 <p><b>Crusted material will collapse and suffocate.</b></p>
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## Keep clear of all augers. DO NOT ENTER this bin!

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**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.**

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## 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

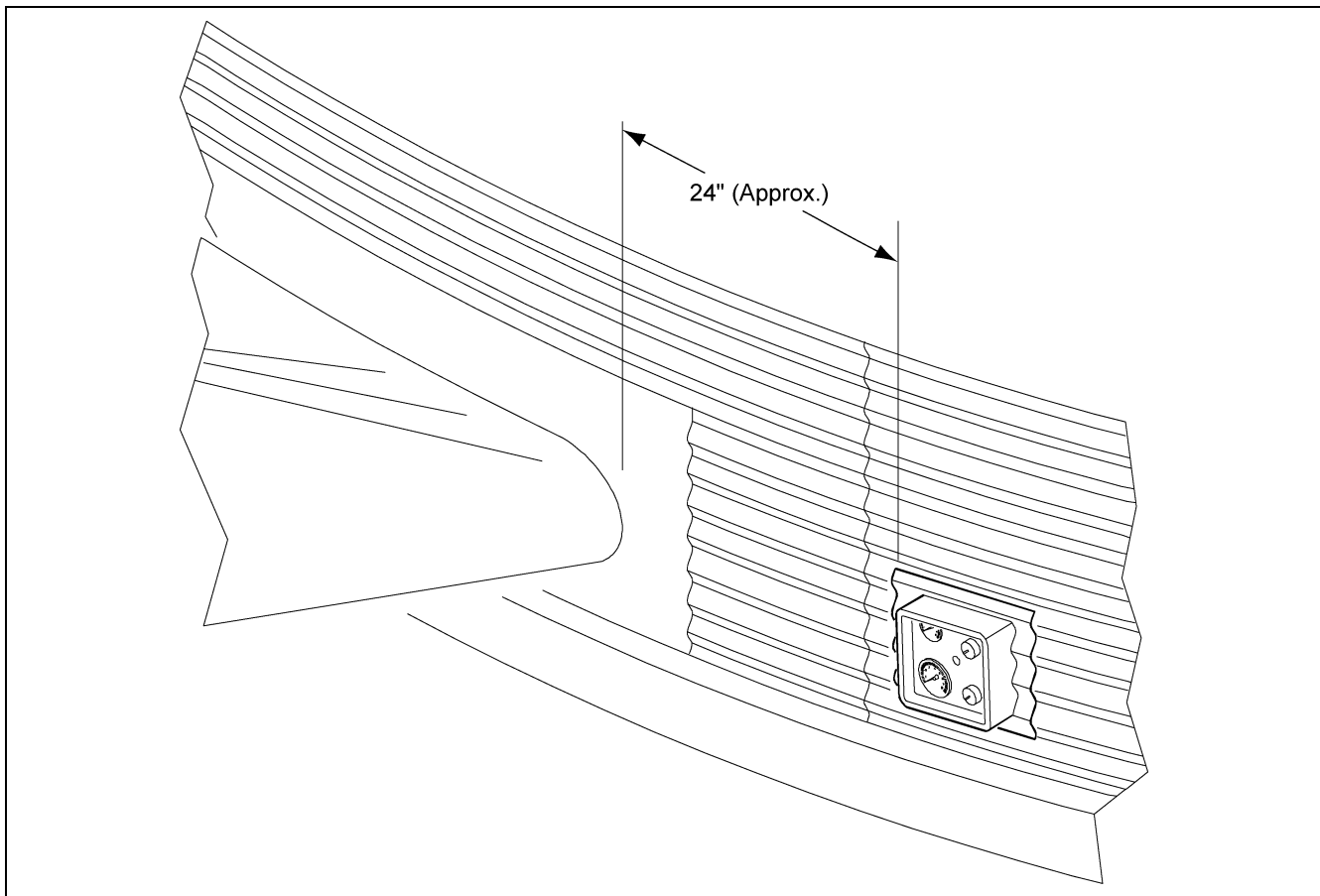


**⚠ WARNING**

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.***

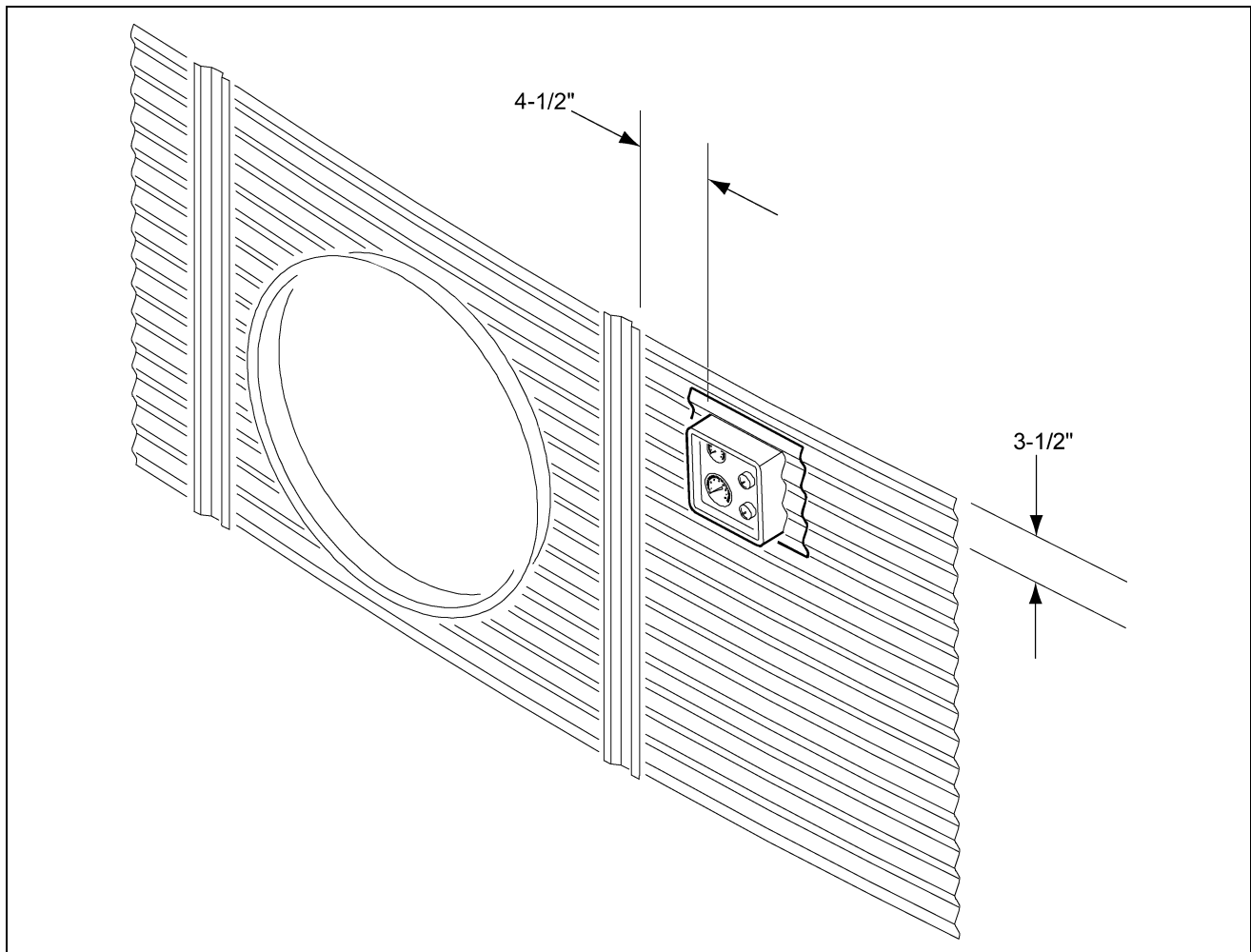
1. The Humidistat-Thermostat should be mounted on the side of the bin wall between the foundation and the drying floor. It should be installed approximately 24" from the right side of the transition as shown in [Figure 3A](#).
2. Use the template [on Page 20](#). With these instructions, drill only the 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 (3<sup>rd</sup> and 4<sup>th</sup> 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 (8<sup>th</sup> and 6<sup>th</sup> 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.***

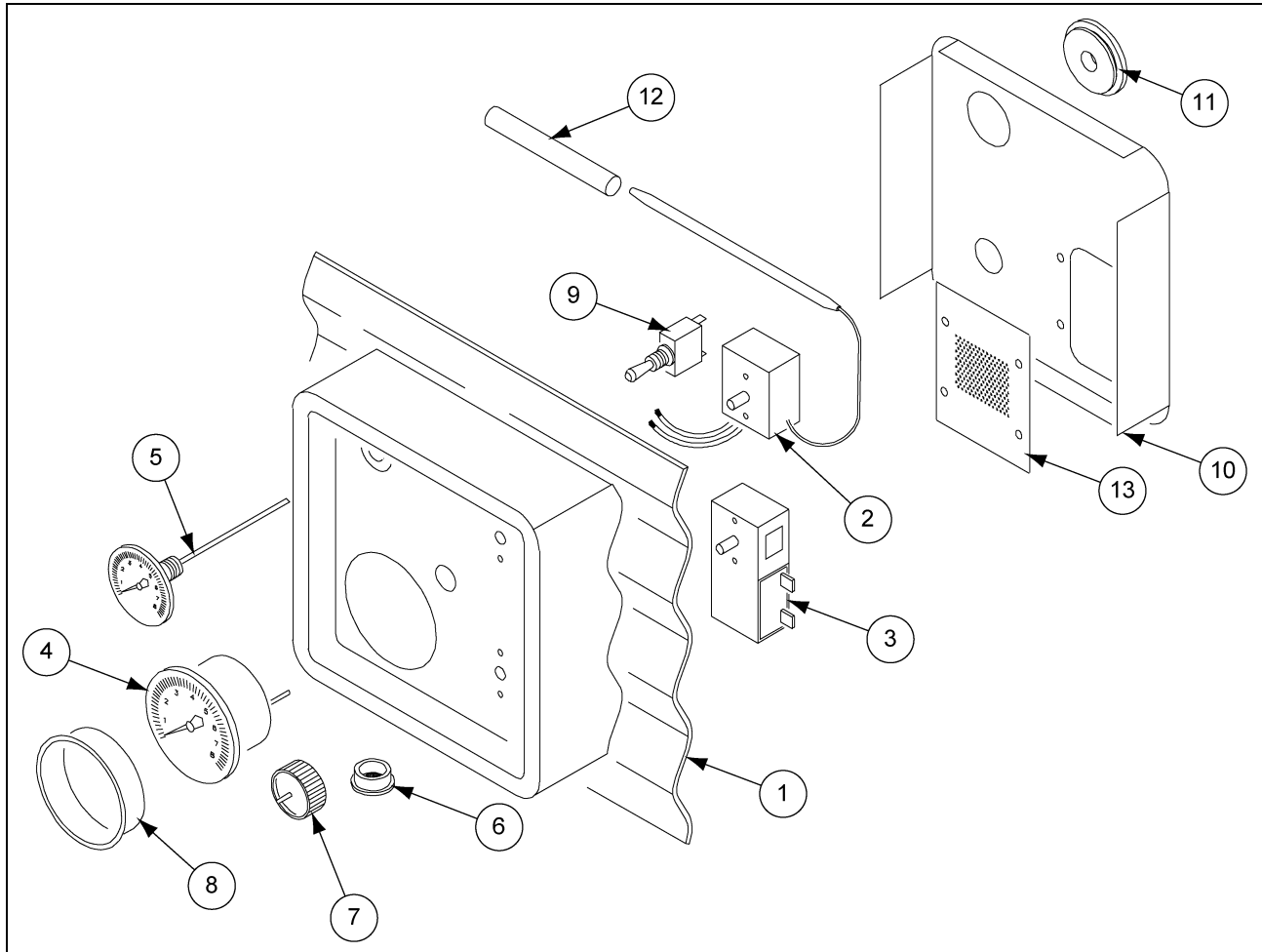
1. Remove mounting screws from the thermostat housing and remove the housing from the bin wall.
2. Carefully remove the back panel from the housing. (It may be necessary to cut caulking.)
3. Blow out any dust or dirt that may have collected inside the housing.
4. Inspect the wiring for any loose connections, 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.**

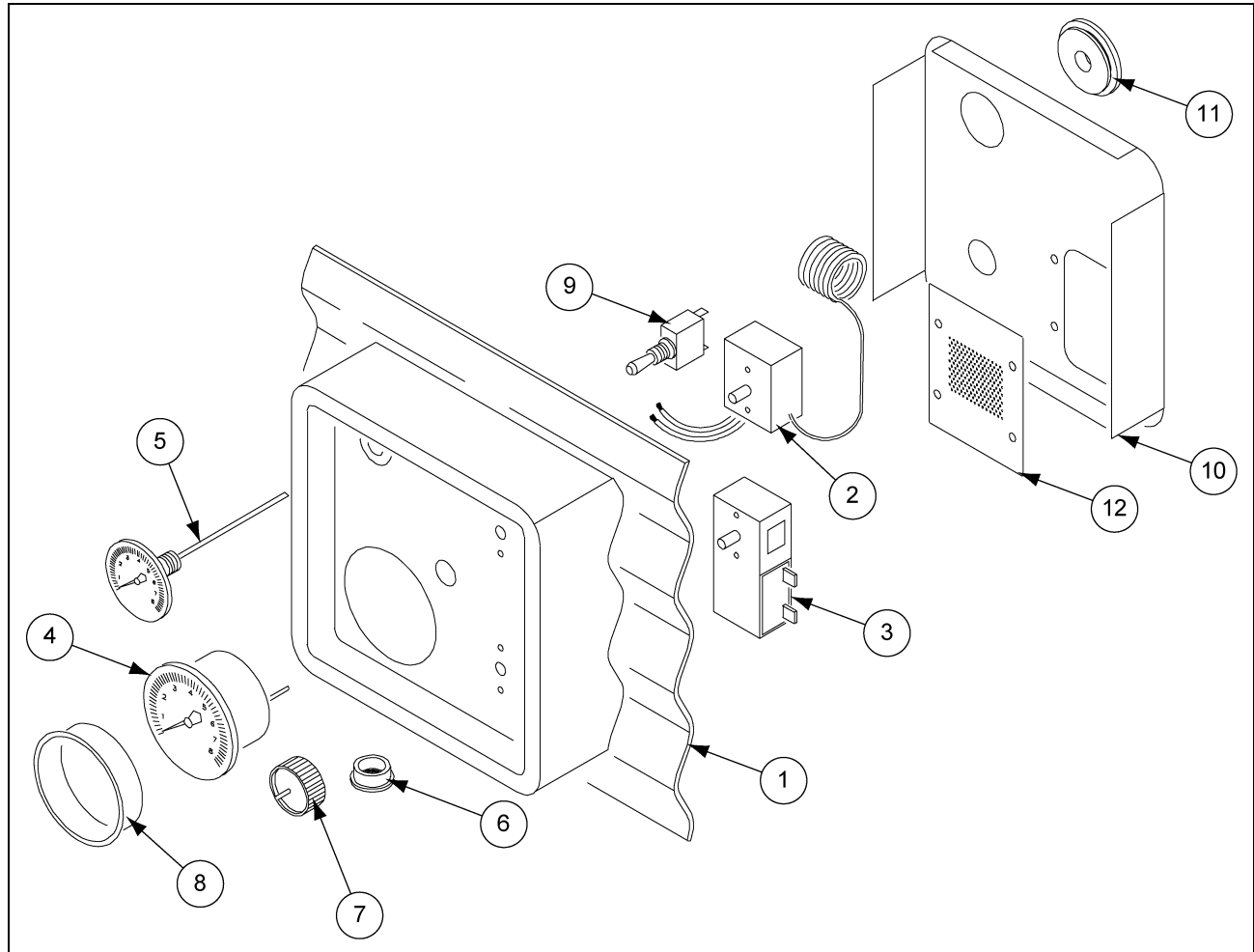
**Figure 6A**

## Humidistat-Thermostat Parts



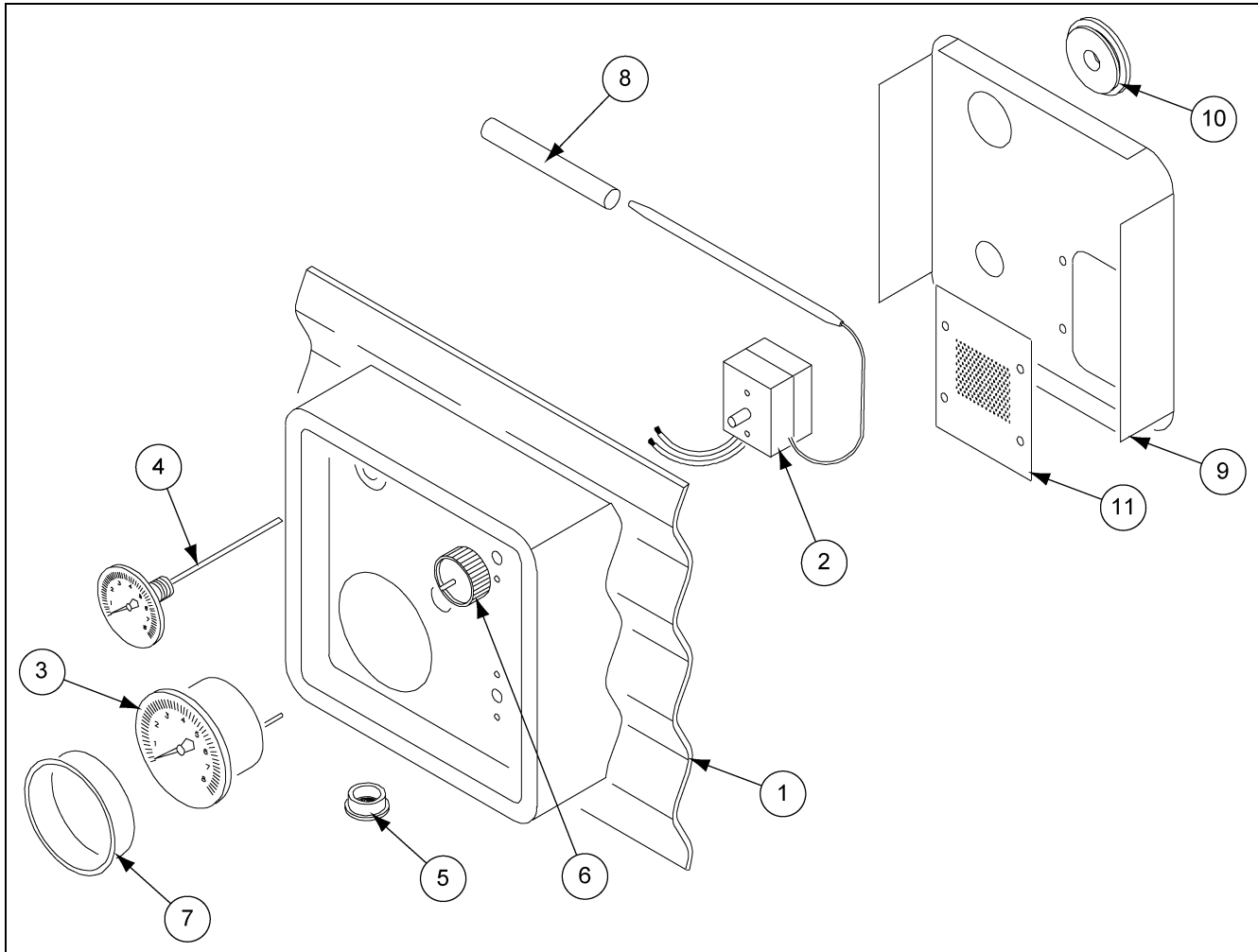
Ref #	Part #	Description
1	HF-1431	2.66" Plastic Housing
1	HF-1446	4.00" Plastic Housing
2	HF-1432	Thermostat
3	HF-1433	Humidistat
4	HF-1434	Static Pressure Gauge
5	HH-1435	220° Thermometer
6	HH-1436	Screen Plug
7	HH-1970	Plastic Knob
8	HH-2089	Large Red Plastic Plug
9	HH-1442	Toggle Switch
10	HF-7108	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



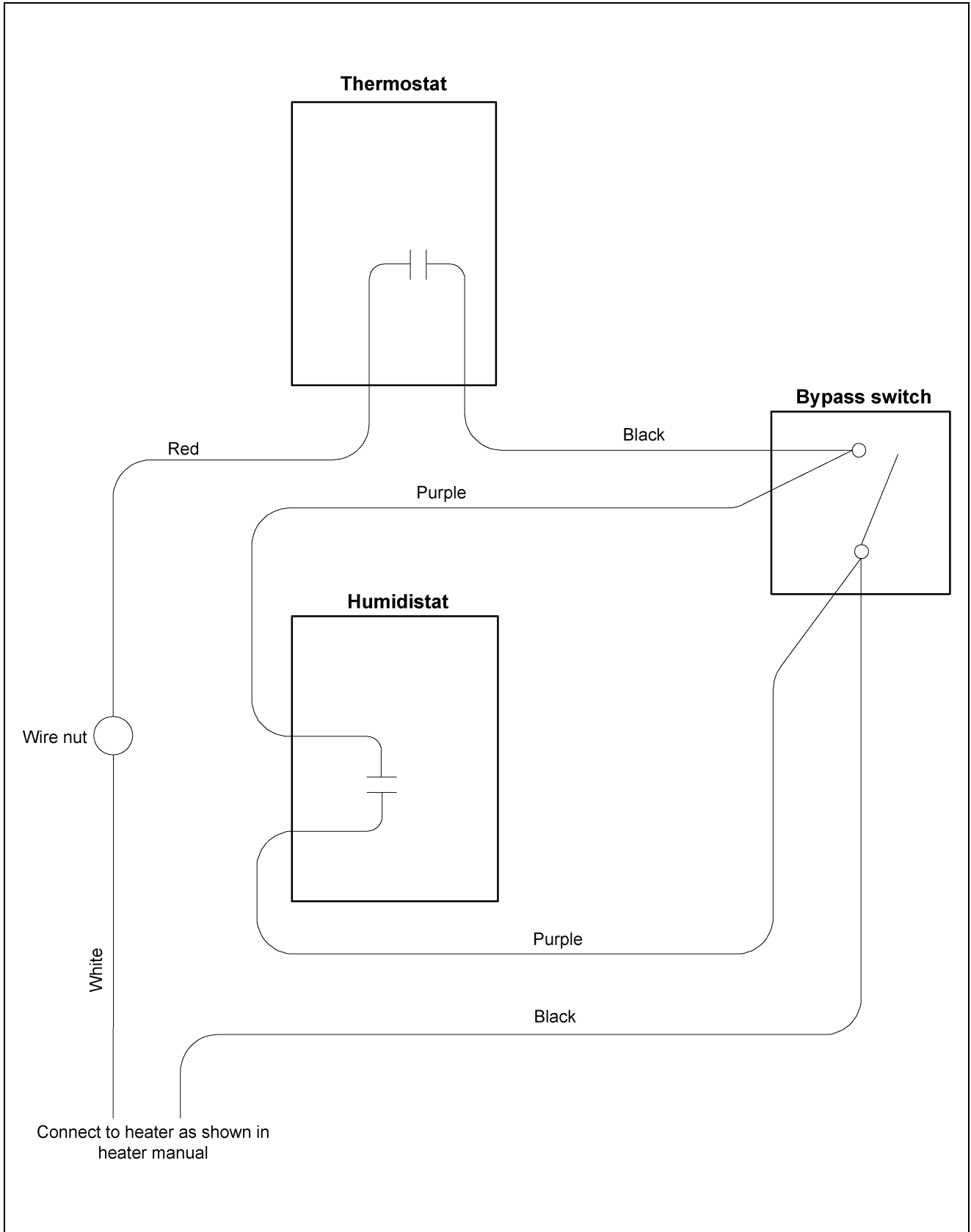
Ref #	Part #	Description
1	HF-1431	2.66" Plastic Housing
1	HF-1446	4.00" Plastic Housing
2	HF-3974	Low-Temperature Thermostat
3	HF-1433	Humidistat
4	HF-1434	Static Pressure Gauge
5	HH-3973	140° Thermometer
6	HH-1436	Screen Plug
7	HH-1970	Plastic Knob
8	HH-2089	Large Red Plastic Plug
9	HH-1442	Toggle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

## High-Low Humidistat-Thermostat Parts



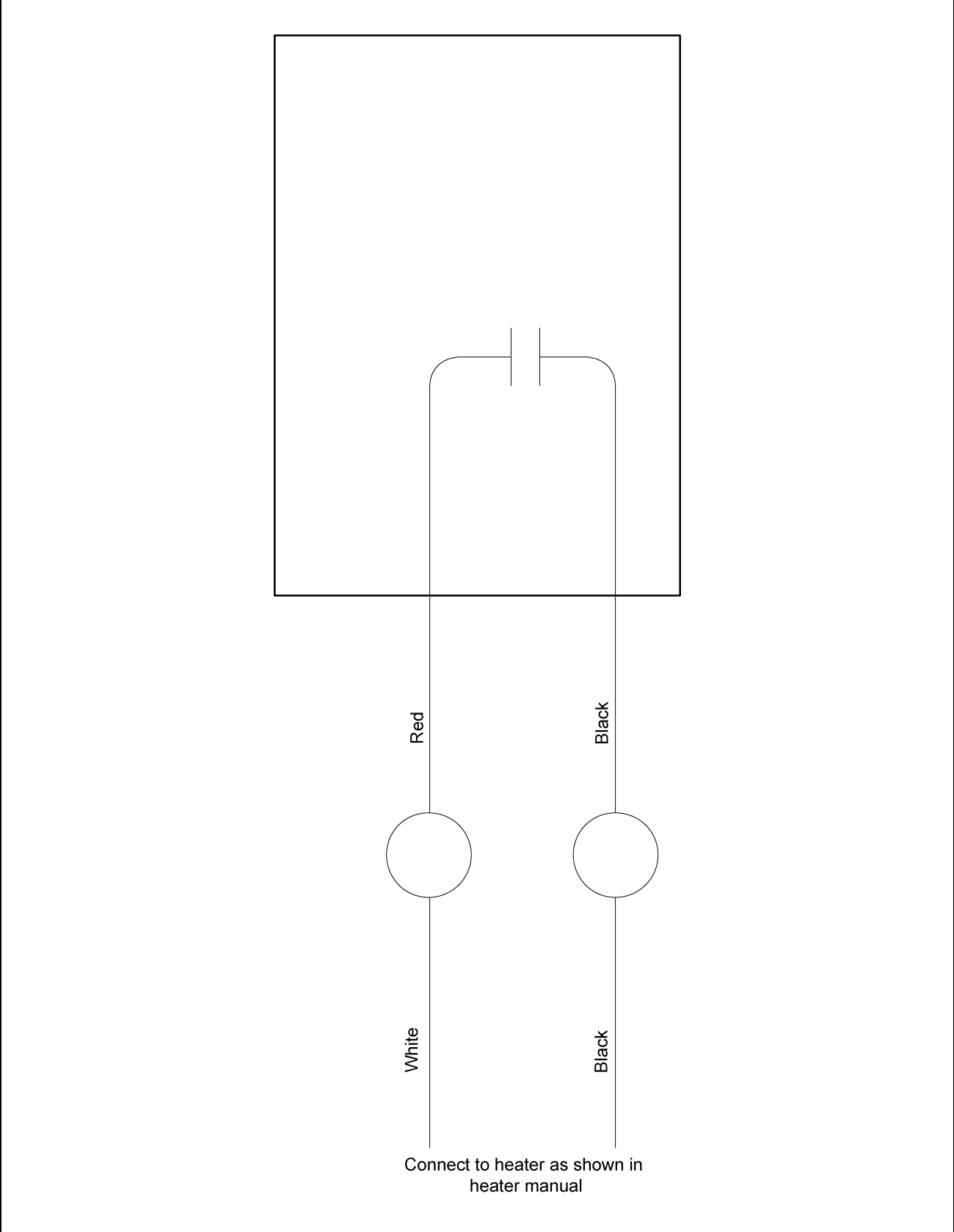
Ref #	Part #	Description
1	HF-1431	2.66" Plastic Housing
1	HF-1446	4.00" Plastic Housing
2	HF-7028	Low-Temperature Thermostat
3	HF-1434	Static Pressure Gauge
4	HF-1435	220° Thermometer
5	HH-1436	Screen Plug
6	HH-1970	Plastic Knob
7	HH-2089	Large Red Plastic Plug
8	HH-7029	Heat Shrink Tube 1/2"
9	HH-7108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

# Humidistat-Thermostat Wiring

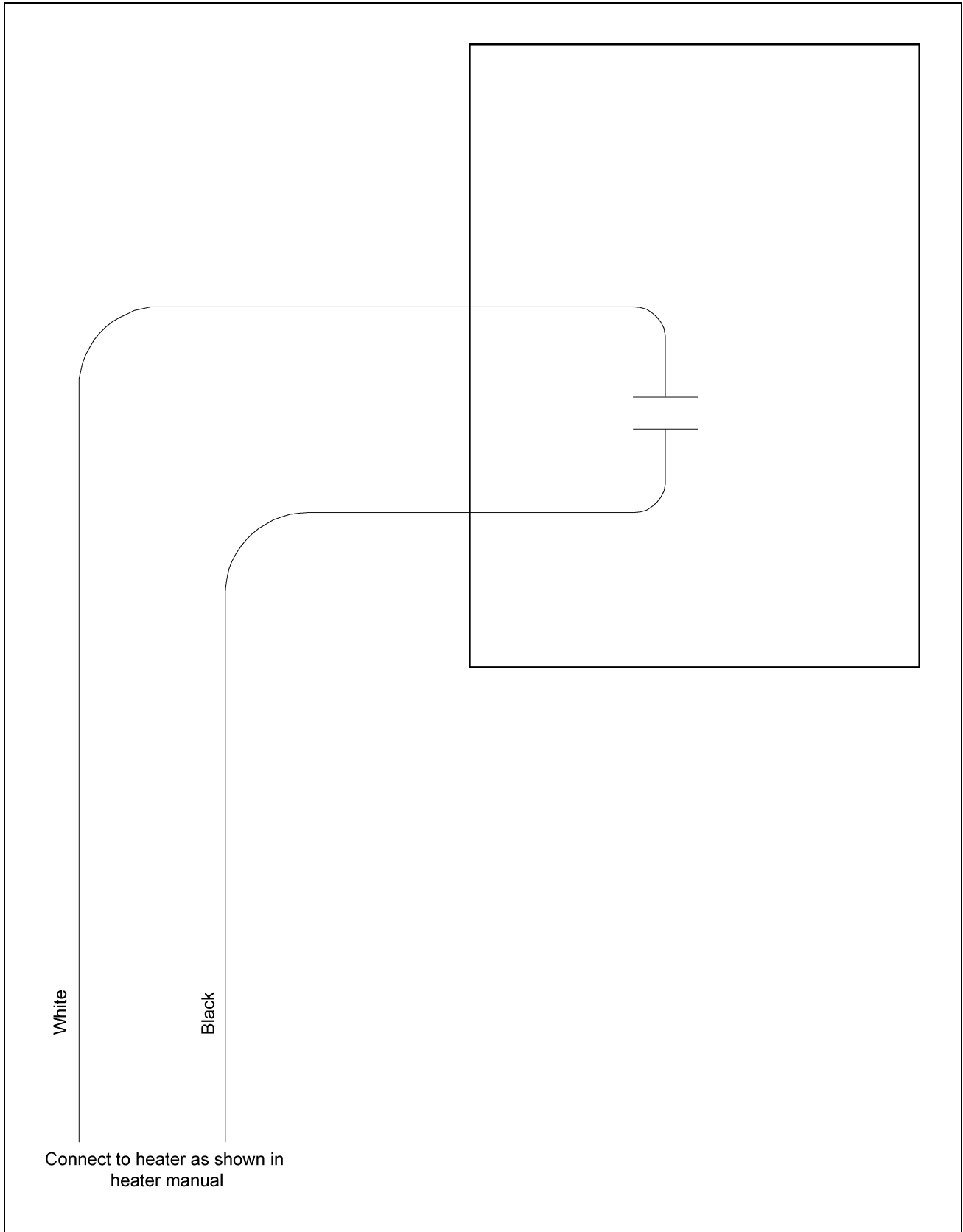




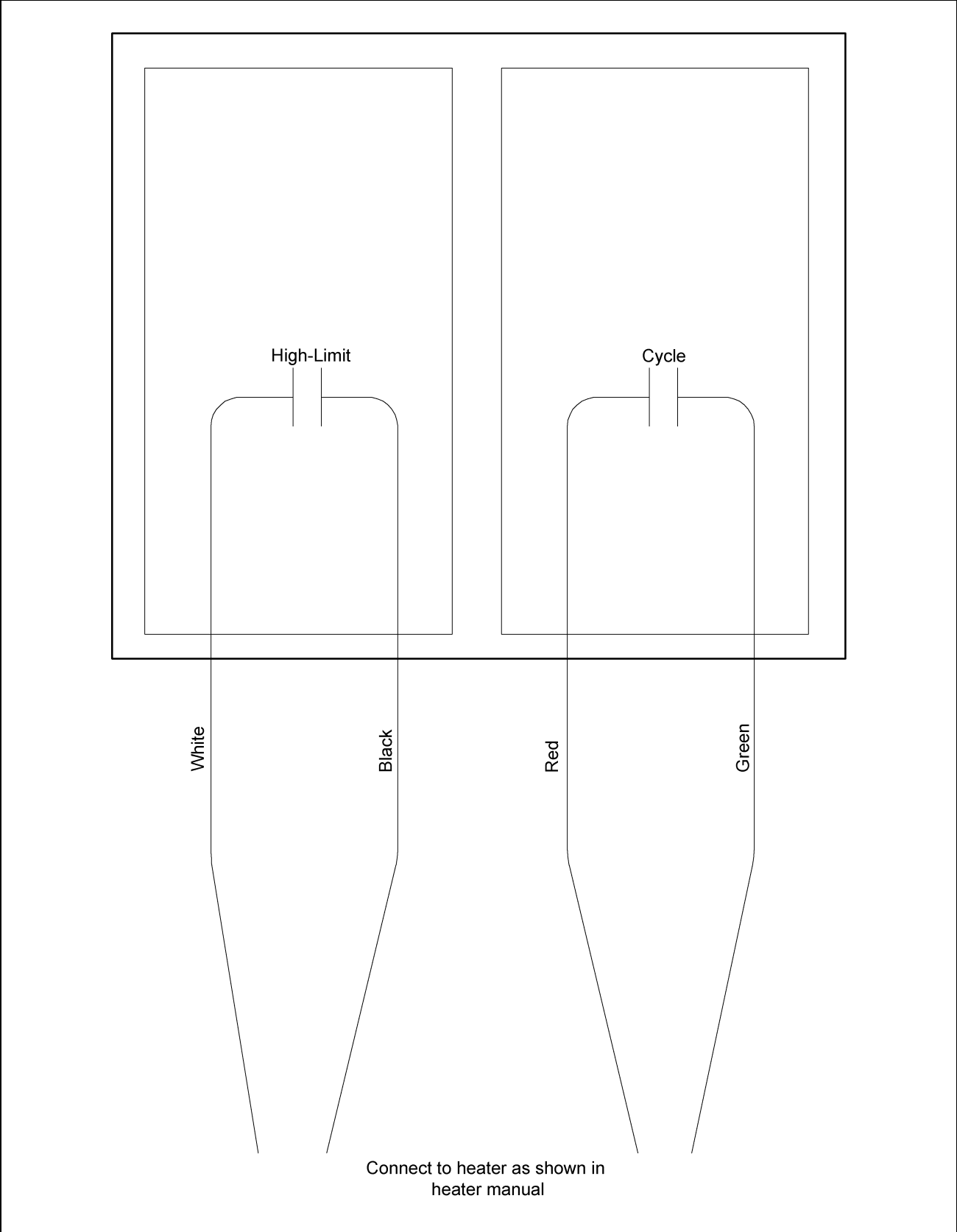
# Thermostat Wiring



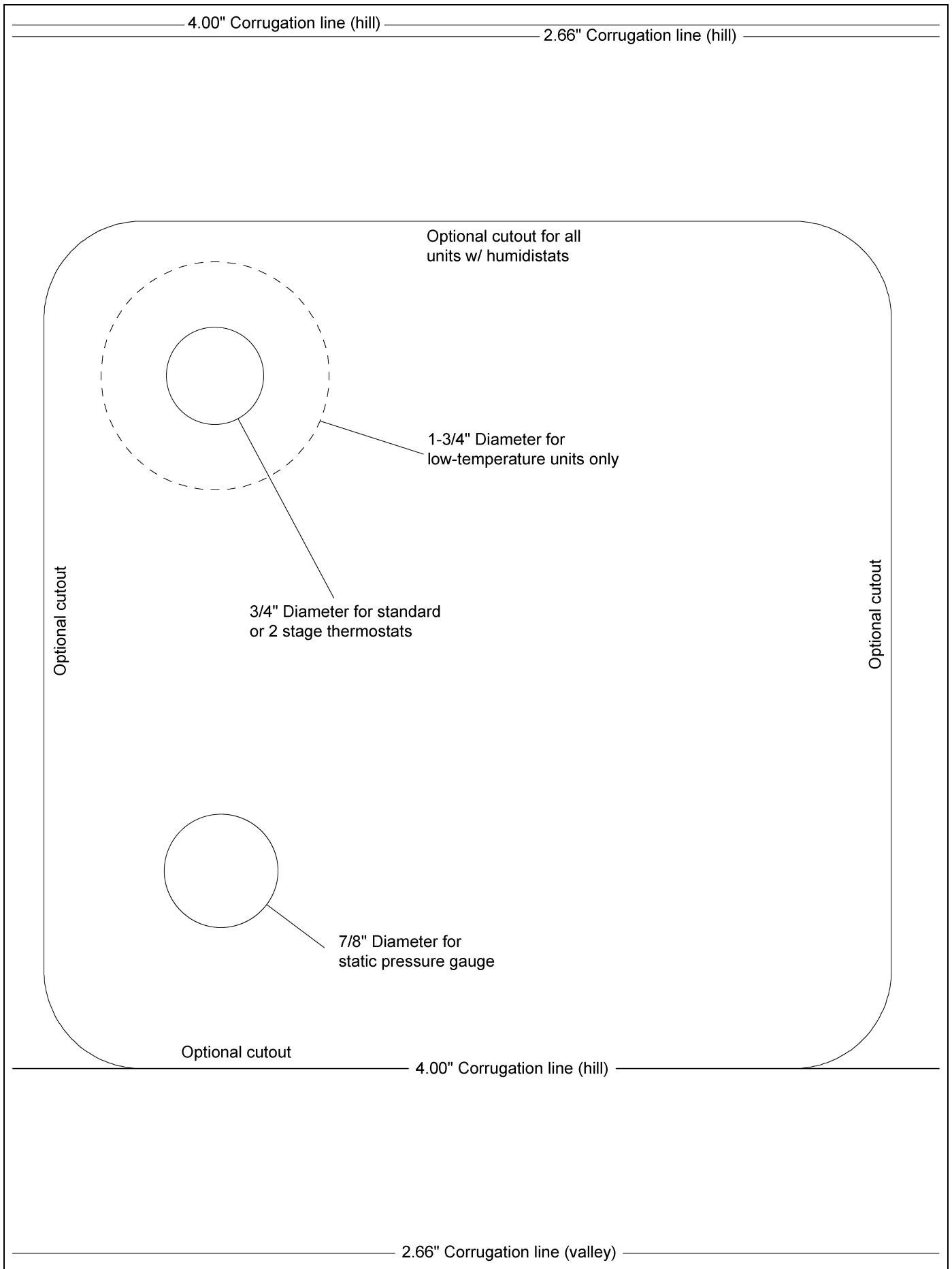
# Humidistat Wiring



# High-Low Thermostat Wiring



# 9. Mounting Template



## Limited Warranty — N.A. Grain Products

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 from the date of shipment (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI's sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

**Warranty Enhancements:** The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period. (Warranty Period is from date of shipment.)

	Product	Warranty Period
<b>Storage</b>	Grain Bin Structural Design • Sidewall, roof, doors, platforms and walkarounds • Flooring (when installed using GSI specified floor support system for that floor) • Hopper tanks (BFT, GHT, NCHT, and FCHT)	5 Years
<b>Conditioning</b>	Dryer Structural Design – (Tower, Portable and TopDry) • Includes (frame, portable dryer screens, ladders, access doors and platforms)	5 Years
	All other Dryer parts including: • Electrical (controls, sensors, switches and internal wiring)	2 Years
	All Non-PTO Driven Centrifugal and Axial Fans	3 Years
	Bullseye Controllers	2 Years
<b>Material Handling</b>	Bucket Elevators Structural Design	5 Years
	Towers Structural Design	5 Years
	Catwalks Structural Design	5 Years
	Accessories (stairs, ladders and platforms) Structural Design	5 Years

### Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY 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.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. 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. Prior to installation, the end-user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. 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.

#### Notice Procedure:

In order to make a valid warranty claim a written notice of the claim must be submitted, using the RMA form, within 60 days of discovery of a warrantable nonconformance. The RMA form is found on the OneGSI portal.

#### Service Parts:

GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase unless specified in Enhancements above.

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



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