Standard Vane Axial Heater

MODEL # VH - \_ \_ - \_ \_ - S (HIGH) MODEL # VL - \_ \_ - \_ \_ - S (LOW)

## Owner's Manual

MANUAL # PNEG-592







✓ OK

- 1. All wire connections
- \_\_\_\_\_ 2. Spark plug gap .125
- \_\_\_\_\_ 3. Pipetrain tightness and gas leaks
- \_\_\_\_\_ 4. Flame sensor tight
- \_\_\_\_\_ 5. Fuse in place, extra fuse provided
- \_\_\_\_\_ 6. Time delay reset
- \_\_\_\_\_ 7. Indicator light
- \_\_\_\_\_ 8. Pressure gauge
- 9. Regulator adjusted
- \_\_\_\_\_ 10. Shut off valve operates correctly
- \_\_\_\_\_ 11. Vapor high limit
- \_\_\_\_\_ 12. Unit cycles on to off
- \_\_\_\_\_ 13. Heat rise even across transition
- \_\_\_\_\_ 14. Unit cycles hi to lo (hi-lo only)
- \_\_\_\_\_ 15. Mod valve holds temperature within 1 degree (mod units only).
- \_\_\_\_\_ 16. All decals and serial number tag
- \_\_\_\_\_ 17. Aesthetic appearance
- \_\_\_\_\_ 18. Manual

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

Date\_\_\_\_\_

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GSI DOES NOT WARRANT ANY ROOF DAMAGE CAUSED BY EXCESSIVE VACUUM OR INTERNAL PRESSURE FROM FANS OR OTHER AIR MOVING SYS-TEMS. ADEQUATE VENTILATION AND/OR "MAKEUP AIR" DEVICES SHOULD BE PROVIDED FOR ALL POW-ERED AIR HANDLING SYSTEMS. GSI DOES NOT REC-OMMEND 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.

#### **Heater Operation**

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

This manual describes the operation of the GSI Standard Vane Axial Heater. Many models are available to accommodate low, medium or high temperature grain conditioning.

The principal concern of The GSI Group Inc.. (GSI) is your safety and the safety of others associated with grain handling equipment. This manual is written to help you understand safe operating procedures, and some of the problems that may be encountered by the operator or 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 who are in the heater area. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

The symbol shown is used to call your attention to instructions concerning your personal safety. Watch for this symbol; it points out important safety precautions. It means "ATTEN-TION", "WARNING", "CAU-TION", and "DANGER". Read the message and be cautious to the possibility of personal injury or death.

#### Safety Alert Symbol



#### 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.



#### **Fuel Warning**

Important! Do not use propane tanks which have previously been used for ammonia unless they have been purged according to procedures of the National L. P. Association.

Be sure fuel supply system complies with all local codes for L.P. gas installations. DO NOT USE FLAME FOR LEAK TESTING.

### **Power Warning**

Be sure power is disconnected and locked out before installation! Failure to do so may cause serious injury or death.

Important! Heater must be interlocked with fan for safe operation.

Important! Thermostat must be installed for safe operation.

### **Proper Use of Product**

This product is intended for the use of grain drying only! Any other use is a misuse of this product. This product has sharp edges! These sharp edges may cause serious injury. To avoid injury handle sharp edges with caution and use proper protective clothing and equipment at all times. Guards are removed for illustration only. All guards must be in place before and during operation.

## SAFETY ALERT DECALS



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





Safety decals should be read and understood by all people in the grain handling area. The bottom-right decal warns that the enclosure contains electrical devices carrying high voltages that will cause injury or death. Lockout power before servicing.

If a decal is damaged or is missing contact:

The GSI Group Inc. 1004 E. Illinois St. Assumption, IL 62510 217-226-4421 A free replacement will be sent to you. Safety Alert Decals for Door



Stay clear of rotating blade. Blade could start automatically. Can cause serious injury. Disconnect power before servicing. DC-1225





High voltage. Will cause seriou injury or death. Lockout power before servicing.

DC-1224



## **A**WARNING

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



**Safety Decals for Housing** 







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Stay clear of rotating blade. Blade could start automatically. Can cause serious injury. Disconnect power before servicing. DC-1225



## AWARNING

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

DC-1227













#### **Fuel Connection**



Important! Do not use propane tanks which have previously been used for ammonia unless they have been purged according to procedures of the National L. P. Association.

Be sure fuel supply system complies with all local codes for L. P. gas installations.

## **Liquid Propane Models**

- LP models are designed to run on liquid propane, with liquid draw from the propane tank. Avoid using propane supply tanks that have been used for vapor draw for long periods of time. When using liquid draw systems any moisture that may be present in tank or lines may freeze when system is used in cold weather. To avoid this, the usual precaution is to purge the system with methanol.
- 2. Run proper size line (see specifications) to liquid pipetrain on heater. Have a qualified gas service man inspect installation to be sure that everything is installed according to local codes and ordinances.
- After installation is complete check all connections for leaks with liquid detergent or comparable. Wear rubber gloves and eye protection. Avoid contact with liquid propane. DO NOT USE FLAME FOR LEAK TESTING.

## **Propane Vapor Models**

1. Propane vapor models are designed to run directly off of supply tank or from a separate external vaporizer.

- 2. Run proper size line (see specifications) to pipetrain on heater. Have a qualified gas service person inspect installation to be sure everything is installed according to local codes and ordinances.
- After installation is complete check all connections for leaks.
   DO NOT USE FLAME FOR LEAK TESTING. (See above for other precautions.)

#### Natural Gas Models

- Natural gas models are similar to vapor models, but have a larger orifice to accommodate lower pressure sometimes found with natural gas.
- 2. Run proper size line (see specifications) to pipetrain on heater. Have a qualified gas service man inspect installation to be sure everything is installed according to local codes and ordinances.
- 3. After installation is complete check all connections for leaks. DO NOT USE FLAME FOR LEAK TESTING. (See above for other precautions.)

#### **Heater Electrical Installation**

- 1. Connect power cord to fan control box.
- 2. Make field connections of wires in fan box as shown in Figure 1.
- 3. Connect deluxe thermostat control (optional) in heater box as shown in Figure 1. IMPORTANT! THERMOSTAT MUST BE INSTALLED FOR SAFE OPERATION.

IMPORTANT! HEATER MUST BE INTER-LOCKED WITH FAN FOR SAFE OPERATION.



- 7. Connect wire from terminal 5 in master to terminal 8 (point G) in slave unit.
- 8. Install relay (TD-100282) in relay base.

Follow these additional steps for HI-LO units.

- Install relay base (TD-100283) in master heater control box.
- 2. Connect wire between terminal 13 (point E) on relay base to green wire from HI-LO thermostat in master unit. Do not disconnect other wires from green wire 3. Connect wire between terminal 14 on relay base to terminal 14 on other relay base in master heater.
- 4. Run 2 wires (18 gauge) between master and slave heater.
- Connect wires to terminals 5 and 9 (points C and D) on relay base in master heater.
- 6. Connect wire from terminal 9 in master to terminal 6 (point H) in slave unit.
- Connect wire from terminal 5 in master to cycle solenoid and red light in slave unit. Do not connect wire to side of cycle solenoid and light that are connected to terminal.



Figure 2: Illustration of second heater wiring.

		18"	24"	26"	28"
All models	Inside diameter Bolt circle diameter Length BTU rating Weight	18.5/16" 19.7/16" 22" 1400000 81	24.1/4" 25.3/4" 22.1/2" 2100000 110	26.5/16" 27.15/16" 22.1/4" 2700000 115	28.1/8" 29.5/8" 25.1/4" 3000000 140
Liquid models	Maximum fuel flow (GPH) Orifice Modulating valve bypass orifice Minimum operating pressure Maximum operating pressure Minimum line size	N/A N/A N/A N/A N/A	23 3/16" Blue 2 20 3/8"	30 7/32" Blue 2 20 3/8"	34 15/64" Aluminum 2 20 3/8"
Vapor models	Maximum fuel flow (CFH) Orifice Modulating valve bypass orifice Minimum operating pressure Maximum operating pressure Minimum line size	585 5/32" Green 2 20 1/2"	877 3/16" Blue 2 20 3/4"	1128 7/32" Blue 2 20 3/4"	1253 15/64" Aluminum 2 20 3/4"
Natural gas models	Maximum fuel flow (CFH) Orifice Modulating valve bypass orifice Minimum operating pressure Maximum operating pressure Minimum line size	1473 1/4" Blue 1 7 3/4"	2210 5/16" Aluminum 1 7 1"	2842 23/64" Aluminum 1 7 1.1/4"	3157 3/8" Aluminum 1 7 1.1/4"

## **High Temperature Heater Specifications**

## Low Temperature Heater Specifications

		18"	24"	26"	28"
All models	Inside diameter	18.5/16"	24.1/4"	26.5/16"	28.1/8"
	Bolt circle diameter	19.7/16"	25.3/4"	27.15/16"	29.5/8"
	Length	22"	22.1/2"	22.1/4"	25.1/4"
	BTU rating	400000	500000	500000	500000
	Weight	81	110	115	140
Vapor models	Maximum fuel flow (GPH)	167	292	292	292
	Orifice	5/64"	3/32"	3/32"	3/32"
	Modulating valve bypass orifice	Red	Yellow	Yellow	Yellow
	Minimum operating pressure	2	2	2	2
	Maximum operating pressure	20	20	20	20
	Minimum line size	3/8"	3/8"	3/8"	3/8"
Natural gas models	Maximum fuel flow (CFH) Orifice Modulating valve bypass orifice Minimum operating pressure Maximum operating pressure Minimum line size	421 9/64" Yellow 1 7 1/2"	736 5/32" Green 1 7 1/2"	736 5/32" Green 1 7 1/2"	736 5/32" Green 1 7 1/2"

## **Bin Configuration**



**IMPORTANT!** When mounting (2) heaters on a bin it is imperative that they be situated as in above drawing. Plenum thermostat must be to the right of master heater and master heater must be to the right of slave heater.

#### **Transition Hi-limit Installation**

- Mark location on transition one

   foot up from the bottom
   (entrance collar) and centered
   in the transition.
- 2. Drill or knock out 7/8" diameter hole on marked location.
- 3. Install transition hi-limit using supplied self drilling screws.



Figure 2: The transition connecting the Vane Axial Heater to the bin with the plenum sensor in place.

#### Plenum Thermostat Mounting

The plenum thermostat is the  $4 \times 4$ white box with knob that is preconnected to heater when heater is ordered with thermostat.

- 1. 24" to the right side of the transition, drill one  $\frac{3}{8}$ " hole (high temp) or  $1 \frac{1}{2}$ " hole (low temp) in the center of the plenum in a valley (4.00" corrugation) or hill (2.66" corrugation) on bin sidewall.
- 2. Insert the probe through the hole.
- 3. Position the housing so that the tabs are vertical, and the cord exits the housing horizontally.



Plenum thermostat mounting on bin wall.

- 4. Use 4 self drilling screws to mount the housing to the bin sidewall.
- 5. Caulk between the housing and the sidewall to seal.

#### THIS TABLE IS NOT INTENDED AS A DRYING GUIDE. IT SHOULD BE USED AS A REFERENCE FOR SETTING MAXIMUM PLENUM TEMPERATURE FOR SAFE OPERATION.

#### **Operating Temperature Table**

	LO-TEMP BATCH	HIGH- TEMP BATCH DRY NO STIRRING	HIGH- TEMP WITH STIRRING	CONTINUOUS FLOW (RECIRCULATING)
CORN	5-20° ABOVE AMBIENT TEMP	1200	140°	160°
RICE	5-10° ABOVE AMBIENT TEMP	100°	100°	NOT RECOMMENDED
BEANS & WHEAT	5-20° ABOVE AMBIENT TEMP	110º	1200	NOT RECOMMENDED

#### IMPORTANT! DO NOT EXCEED PLENUM TEMPERATURES LISTED IN TABLE

## **Standard Heater Operation**

- 1. Thermostat must be wired into heater control box for heater to operate.
- 2. Open all manual shut-off valves to heater unit.
- 3. Start fan. This will supply power to heater.
- 4. Turn thermostat dial to its highest setting.
- 5. Turn toggle switch on.
- 6. Heater should now be lit. If not check to see that all gas is on.
- Watch thermometer on plenum and when it reaches desired temperature turn thermostat back slowly until heater cycles off.
- Gas pressure should be adjusted so burner is on 75% of the time.
- 9. Watch plenum temperature as burner goes through a few cycles, to be sure that it is operating properly.

## **Hi-lo Heater Operation**

- 1. Hi-limit and cycling thermostat must be wired into heater control box for heater to operate.
- 2. Open all manual shut-off valves to heater unit.

- 3. Start fan. This will supply power to heater.
- 4. Turn thermostat dial to its highest setting.
- 5. Turn toggle switch on. Both red lights should light up indicating power to the control circuit.
- 6. Heater should now be lit. If not check to see that all gas is on.
- 7. Open low-fire ball valve all the way.
- 8. Turn thermostat dial back slowly until heater cycles to low flame.
- 9. Adjust ball valve so that low flame pressure is at desired setting.
- 10. Turn thermostat dial to desired setting and wait for bin plenum to come up to temperature. Heater should cycle to low flame after a few minutes. If heater does not cycle to low flame increase hi-flame gas pressure.
- 11. Low-flame should be adjusted so that temperature drops slowly until burner goes back to high flame.
- 13. Watch as burner goes through a few cycles, to be sure that it is operating properly.

## **Modulating Valve Operation**

- 1. The modulating valve regulates gas flow through the heater based on sensing unit in the plenum, and maintains a constant drying air temperature.
- 2. The sensing bulb of the modulating valve should be mounted through the bin wall with the side reading "top" up. The bulb reacts to temperature. It changes the amount of gas (increase or decrease), burning warmer or cooler depending on the position of the valve SET POINT. If the bulb is cooler than it was at the SET POINT, the bulb senses the cooler temperature and opens the valve further so more heat is applied to the drying air. If the bulb is warmer than it was at the SET POINT, the valve closes further and reduces the temperature until the air is at the valve SET POINT.
- 3. It is important that the pressure regulator be set high enough to allow the modulating valve to deliver enough gas to maintain the plenum temperature necessary. The regulator is normally factory set at 15 psi (propane units). To set the regulator, run the heater and turn the modulating valve T-handle in. This gets full line pressure to the burner. Then adjust regulator to read 15 psi (depending on the plenum temperature needed).
- 4. Turn the fan and heater on. To set the modulating valve, turn the T-handle out (counterclockwise) until loose and wait a few minutes for the plenum temperature to equalize. When the temperature under the bin has equalized, gradually turn T-handle in (clockwise) about 1/2 turn at a time.

Wait until temperature under bin has equalized as before. If temperature under bin is less than the desired temperature, continue turning T-handle in, increasing gas flow and waiting for plenum temperature to equalize until the desired temperature is the stable temperature of the plenum. If temperature under bin is the same 10 minutes after you last made any adjustments to the T-handle you can be certain that the temperature under the bin is the SET POINT of the valve. **1 turn of the T-handle equals approximately 7 degrees F of temperature.** 

- 5. The valve will now keep the plenum temperature at the set point regardless of ambient conditions as long as humidistat or thermostat do not shut down the heater. A bypass orifice is used to maintain a small flame when outside temperature is near or above the set point of the valve. The bypass insures steady application of heat at minimum gas flow operation. Bypass orifice will only operate correctly if pressure regulator is set correctly.
- 6. To observe how the modulating valve increases the efficiency of bin drying, check the gas pressure of the unit in the morning and compare to the pressure read mid-afternoon. If the ambient (outside) temperature is significantly greater later in the day (as normal), the gas pressure will be less. Since less heat is required to maintain the same temperature in the plenum, the modulating valve will have reduced the amount of gas used by the heater.

## **Btu's Per Gauge Pressure (Psi) Propane Models (Approximate)**

	nigh TeivipenATORE									
		Operating Pressure (PSI)								
Diameter	2	4	6	8	10	12	14	16	18	20
18"	416380	588680	720290	832760	930880	1019420	1107800	1174960	1244360	1340080
24"	598250	844730	1036170	1198890	1340080	1464520	1581770	1689460	1787570	1892860
26"	816010	1148640	1409480	1632030	1825860	1995762	2153700	2302070	2436070	2577260
28"	935660	1318540	1617670	1868930	2091480	2309250	2467180	2649050	2792630	2955360

#### HIGH TEMPERATURE

#### LOW TEMPERATURE

		Operating Pressure (PSI)								
Diameter	2	4	6	8	10	12	14	16	18	20
18"	102900	145970	181870	208190	234510	253660	275200	294340	311090	335020
24-28"	148370	210580	258440	299130	335020	366130	394850	421170	447490	473810

## GAUGE PRESSURE (PSI) REQUIRED TO MAINTAIN TEMPERATURE (APPROXIMATE) (HIGH TEMP UNITS ONLY)

	Static			Hea	t Rise Degrees	s F		
Fan Model	Pressure	60	80	100	120	140	160	180
	1"	2	3	4	5	6	8	9
3HP-18"	2"	1	1	2	3	4	5	6
	3"	low-temp	low-temp	1	2	2	3	3
	1"	2	4	6	8	10	14	17
	2"	1	3	4	5	7	9	11
7HP-24"	3"	low-temp	low-temp	1	2	3	3	4
	4"	low-temp	low-temp	low-temp	low-temp	1	2	3
	1"	4	6	9	13	18	22	26
	2"	3	5	8	10	14	18	22
10HP-24"	3"	2	3	4	6	8	9	11
	4"	1	2	3	4	5	6	8
	1"	2	4	6	8	11	14	18
	2"	2	4	5	7	9	13	16
15HP-26"	3"	1	3	4	5	7	10	13
	4"	1	3	4	5	7	9	11
	5"	low-temp	1	2	3	3	4	5
	1"	3	4	7	9	12	16	20
	2"	2	4	6	8	11	14	18
15HP-28"	3"	2	3	4	5	8	10	13
	4"	1	2	3	4	6	8	10
	5"	low-temp	1	2	3	3	4	5

## Btu's Per Gauge Pressure (Psi) Natural Gas Models (Approximate)

		Operating Pressure (PSI)						
Diameter	1	2	3	4	5	6	7	
18"	454180	644780	787970	909260	1016880	1115380	1204750	
24"	710450	1006850	1231200	1419980	1587790	1741920	1881456	
26" 28"	938450 1022350	1331520 1450080	1627920 1772020	1876896 2043790	2099420 2285470	2302800 2507090	2487940 2708640	

#### HIGH TEMPERATURE

#### LOW TEMPERATURE

		Operating Pressure (PSI)							
Diameter	1	2	3	4	5	6	7		
18" 24-28"	144100 177840	205200 251710	250800 308260	289100 355680	322850 397632	353860 435936	383040 470590		

#### GAUGE PRESSURE (PSI) REQUIRED TO MAINTAIN TEMPERATURE (APPROXIMATE) (HIGH TEMP UNITS ONLY)

	Static		Heat Rise Degrees F								
Fan Model	Pressure	60	80	100	120	140	160	180			
	1"	1	1	2	2	3	3	4			
3HP-18"	2"	1	1	1	1	2	2	3			
	3"	low-temp	low-temp	1	1	1	1	31			
	1"	1	2	2	3	4	5	6			
	2"	1	1	1	2	2	3	4			
7HP-24"	3"	low-temp	low-temp	1	1	1	1	2			
	4"	low-temp	low-temp	low-temp	1	1	1	1			
	1"	2	2	4	5	6	7	8			
	2"	1	2	3	3	4	6	7			
10HP-24"	3"	1	1	1	2	2	3	4			
	4"	low-temp	1	1	1	1	2	2			
	1"	1	2	2	3	4	5	7			
	2"	1	1	2	3	3	4	5			
15HP-26"	3"	1	1	2	2	3	3	4			
	4"	1	1	1	1	2	2	3			
	5"	low-temp	low-temp	1	1	1	1	2			
	1"	1	2	3	4	5	7	8			
	2"	1	2	2	3	4	5	6			
15HP-28"	3"	1	1	2	2	3	4	5			
	4"	1	1	1	1	2	2	3			
	5"	low-temp	low-temp	1	1	1	2	2			



## **Adjusting The Vaporizor**

- Vaporizer should be adjusted so the vapor pipetrain runs warm to the touch (100°-120°F).
- 2. Loosen 5/16" bolt on adjustment bracket.
- Swivel vaporizer away from flame if running too hot, closer to flame if too cold.
- 4. Move vaporizer only 1" at a time and allow a few minutes for temperature to equalize.
- 5. Tighten 5/16" bolt and watch heater run for several minutes to verify adjustment.

Adjusting the vaporizer coil on a liquid propane model. The top photo shows the setting in, and the bottom photo shows the coil out.

#### **Standard Vane Axial Heater**

## **TROUBLESHOOTING GUIDE**

Trouble	Probable Cause	Check-out Procedure			
	Heater not wired in	Visually check fan control box to see if wires are con- nected.			
gas pressure on gage. No	Fan not running	Fan contactor must be energized for heater to run.			
ignition spark.	Blown fuse Bad on/off switch	Visually check fuse. Check for power on terminals 2 and 8. If no power, check on/off switch.			
	Housing high-limit switch	Reset switch. With fan running check for 110V power between terms 7 and 8.			
	Flame probe open	Remove wires from flame probe and check with ohm meter. Probe should be closed when cold.			
Burner will not fire. No gas pressure on gage. Ignition spark is constant.	Reset switch	Reset switch. If switch will not reset after 60 seconds replace. If reset button pops out again after 30-60 seconds check flame probe to see that it is getting hot. If flame probe appears to be getting hot, then replace the flame probe.			
	Gas supply	Make sure all valves are on to heater and gas tank is not empty.			
	Terminal strip	Turn power on to heater. Check for power on terms 3 and 4. If power is present, check for power on terms 3 and 6. If no power is present, replace terminal strip.			
Burner will not fire. Gas	Ignitor/spark plug	Turn gas off to heater. Check gap on ignitor. Check porcelain for any sign of cracks. Remove plug wire from spark plug/ignitor. Carefully holding plug wire by insula- tion. Try to get an arc between end of wire and heater housing (or other wire if using 2 pole transformer).			
ignition spark.	Ignition transformer/plug wire	Turn gas off to heater. If no spark present after checking ignitor, remove spark plug wire from ignition transformer. Check for spark at ignition transformer with an insulated screwdriver. Spark should jump a minimum 1/4" gap. Replace transformer if no spark is established. If spark is established, replace the plug wires.			
	Plugged orifice	Check for gas at burner. If no gas, remove pipetrain and check orifice and burner or burner ring for blockages.			
	Flame probe	Check to be sure flame probe is in good condition and is located in flame. Flame probe contacts should open when probe gets hot.			
Burner will not fire or fires	Incorrect supply voltage	Voltage to heater must be 110 volts AC.			
out reset switch. Gas pressure on gage. Ignition is sparking.	Regulator set too low	See that flame burns continuous and is not intermittent. On ring burners be sure flame burns com- pletely around ring.			
	Moisture in fuel	Have tank and lines checked by qualified gas service man.			
	Heater hose gets very hot. Heater shuts down and reset button trips.	Adjust vaporizor out of flame. Move a small amount at a time and allow heater to equalize between adjustments. Also check fan inlet screen for plugging. If flame is very yellow it is due to lack of airflow to unit.			

**Standard Heater Wiring** 









Key	Part Number	Description
1	HF-6785	18" Heater Housing
2	HH-3933	18" Burner Casting
3	HH-1180	18" Flame Spreader
3	HH-4410	18" Lo-Temp Flame Spreader
4	HF-7078	18" Flame Diverter
4	HF-7073	18" Lo-Temp Flame Diverter
5	HF-7381-18	18" Access Panel (Standard)
6	TFH-2046	Access Panel Latch
7	HF-983	18/24" Burner Collector
8	HF-978	18/24/26" Burner Collector Plate
9	HH-1650	Spark Plug
NS	HF-1810	Spark Plug Nut
NS	HF-7260	18-28" Heater Spark Plug Wire
NS	HF-7262	18-28" Heater Flame Probe Wire
10	HH-1097	Flame Probe (Standard)
11	HF-4485	Flame Probe Bracket (Standard)





Key	Part Number	Description
1	HF-6175	24" Heater Housing
1	HF-6176	26" Heater Housing
2	HH-3934	24/26" Burner Casting
3	HH-1179	24/26" Flame Spreader
3	HF-6757	24/26/28" Lo-Temp Flame Spreader
4	HF-7103	24/26" Flame Diverter
4	HF-7107	24/26/28" Lo-Temp Flame Diverter
4	HF-7104	24/26" Diverter Collar
5	HF-7381-24	24" Access Panel (Standard)
5	HF-6062-26	26" Access Panel (Standard)
6	TFH-2046	Access Panel Latch
7	HF-983	18/24" Burner Collector
7	HF-986	26" Burner Collector
8	HF-978	18/24/26" Burner Collector Plate
9	HH-7016	Rubber Grommet
10	HF-7056	Pivot Bracket
11	HF-7057	Adjustment Bracket
12	HF-7060	Vaporizer Support Weldment
13	THF-3237	Vaporizer Cover
14	HH-1650	Spark Plug
NS	HF-1810	Spark Plug Nut
NS	HF-7260	18-28" Heater Spark Plug Wire
NS	HF-7262	18-28" Heater Flame Probe Wire
15	HH-1097	Flame Probe (Standard)
16	HF-4485	Flame Probe Bracket (Standard)
17	HH-7054	24-28" Burner Cone

28" Gas Heater



Key	Part Number	Description
1	HF-6060	28" Heater Housing
2	HH-3934	24/26" Burner Casting
2	THF-3141	28" Burner Casting
3	THF-3144	28" Flame Spreader
3	HF-6757	24/26/28" Lo-Temp Flame Spreader
4	HF-7105	28" Flame Diverter
4	HF-7107	24/26/28" Lo-Temp Flame Diverter
4	HF-7106	28" Diverter Collar
4	HF-7104	24/26" Diverter Collar
5	HF-7381-28	28" Access Panel (Standard)
6	TFH-2046	Access Panel Latch
7	THF-3101	28" Burner Collector
7	HF-986	26" Burner Collector
8	HF-7092	28" Burner Collector Plate
8	HF-978	18/24/26" Burner Collector Plate
9	HH-7016	Rubber Grommet
10	HF-7056	Pivot Bracket
11	HF-7057	Adjustment Bracket
12	HF-7060	Vaporizer Support Weldment
13	THF-3237	Vaporizer Cover
14	HH-1650	Spark Plug
NS	HF-1810	Spark Plug Nut
NS	HF-7260	18-28" Heater Spark Plug Wire
NS	HF-7262	18-28" Heater Flame Probe Wire
15	HH-1097	Flame Probe (Standard)
16	HF-4485	Flame Probe Bracket (Standard)
17	HH-7054	24-28" Burner Cone



Key	Part Number	Description
1	HF-7046	18" Control Box Housing
1	HF-7047	24" Control Box Housing
1	HF-7098	26" Control Box Housing
1	HF-7051	28" Control Box Housing
2	F-942	Control Box Lid
3	HH-1487	Igniton Transformer
4	FH-1059	5 Amp Fuse
4	FH-1058	Fuse Holder
5	HH-1092	High Limit Switch 180 Degree
6	HF-7356	Terminal Strip Flame Proving
7	HH-1442	Toggle Switch
8	HH-1089	Reset Time Delay
9	DC-483	Decal Standard Heater Front Panel
10	TFH-2021	Red Light (110V)
11	FH-1310	Cord Connector
12	HF-7455	High Limit Switch Box Bottom
13	HF-7439	High Limit Switch 250 Degree
14	HF-7454	High Limit Switch Box Top
15	HF-7414	Recessed Plastic Plug

## Axial Propane Vapor Pipetrain



Key	Part Number	Description
1	HH-1077	1/2" 0-30 PSI Regulator (Standard)
2	HH-3670	1/2" x 2 1/2" Nipple
3	HH-1081	1/2" Solenoid (Standard)
4	HH-2029	1/2" x 1 1/2" Nipple
5	HH-2984	30 PSI gauge
6	S-3853	1/2" x 1/4" x 1/2" Tee
7	HH-1083	18/24/28" Orifice Pipe
7	HH-1107	26" Orifice Pipe
8	HF-7036	5/32" Orifice Plug (18" Standard)
8	CD-0149	5/64" Orifice Plug (18" Lo-Temp)
8	HF-7086	3/16" Orifice Plug (24" Standard)
8	HF-7084	3/32" Orifice Plug (24/26/28" Lo-Temp)
8	HF-7087	7/32" Orifice Plug (26" Standard)
8	HF-7088	15/64" Orifice Plug (28" Standard)
9	HH-2653	Modulating Valve (Optional)
10	HH-1251	1/2" Strainer



Key	Part Number	Description
1	TFC-0051	3/4" Ball Valve
2	THH-4136	3/4" x 3" Nipple
3	THH-4039	3/4" Solenoid (Standard)
4	THH-4121	3/4" Close Nipple
5	THH-4158	3/4" x 1/4" x 3/4" Tee
6	D08-0022	15 PSI Gauge
7	HH-7026	3/4" 18/24/28" Orifice Pipe
7	HH-7027	3/4" 26" Orifice Pipe
8	HF-7123	1/4" Orifice Plug (18" Standard)
8	HF-7124	5/16" Orifice Plug (24" Standard)
8	HF-7125	23/64" Orifice (26" Standard)
8	HF-7126	3/8" Orifice (28" Standard)
9	D67-0008	3/4" Strainer
10	HH-7064	3/4" Modulating Valve (Optional)



## Axial Propane Vapor Hi-Lo Pipetrain

Key	Part Number	Description
1	HH-1077	1/2" 0-30 PSI Regulator (Standard)
2	HH-3670	1/2" x 2 1/2" Nipple
3	HH-1081	1/2" Solenoid (Standard)
4	HH-2029	1/2" x 1 1/2" Nipple
5	HH-1453	1/2" x 1/2" x 1/2" Tee
6	THH-4067	1/2" Street Elbow
7	TFC-0030	1/2" Ball Valve
8	S-3853	1/2" x 1/4" x 1/2" Tee
9	HH-2984	30 PSI gauge
10	HH-7019	1/2" Gas Hose
11	HH-1107	26" Orifice Pipe
11	HH-1083	18/24/28" Orifice Pipe
12	HF-7036	5/32" Orifice Plug (18" Standard)
12	HF-7086	3/16" Orifice Plug (24" Standard)
12	HF-7087	7/32" Orifice Plug (26" Standard)
12	HF-7088	15/64" Orifice Plug (28" Standard)
13	HH-1251	1/2" Strainer



#### **Axial Natural Gas Hi-Lo Pipetrain**

Axial LP Pipetrain



1	HH-4845	1/4" Relief Valve
2	THH-4058	1/2" x 1/2" x 1/2" Tee Sh. 80
3	THH-4089	1/2" Male Union Elbow Sh. 80
4	THH-4071	1/2" Elbow Sh. 80
5	CD-0198	Vaporizer Coil
6	D67-0005	1/2" Coupling
7	D07-0009	5/16" x 24" LP Gas Hose
8	HH-7013	200 Degree Vapor High Limit
9	D07-0019	1/2" x 1 1/2" Nipple Sh. 80
10	TFC-0092	1/2" Solenoid Valve 300 PSI
11	TFC-0030	1/2" Ball Valve
12	HH-1251	1/2" Strainer
13	THH-4023	1/2" x 1/4" Reducer Bushing

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