Assembly & Operation Manual
Green Fast Cure
Product Model GF2

<u>WARNING:</u> Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

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<u>Release date November 2021</u>	

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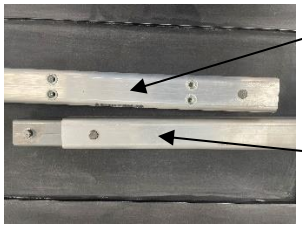

Figure 1:
Wall Support Post Top
Qty: 1 per GF2

Figure 2: Wall Support Post Bottom with pre-attached Connecting Bracket and screws
Qty: 1 per GF2

Figure 3: Wall Brackets for Wall Support Post
Qty: 1 per GF2

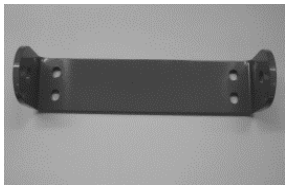

Figure 4:
Swivel Support Brackets
Qty: 2 per GF2

Figure 5:
Hexagonal Screws 5/16 x 1”
Qty: 8 per GF2¨

Figure 6:
Flat Washers 5/16”
Qty: 8 per GF2

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Qty: 2 per GF2

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Qty: 4 per GF2

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Lock Washer ½”
Qty: 4 per GF2

Figure 10:
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Qty: 2 per GF2

Figure 11:
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Qty: 2 per GF2

Figure 12:
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Qty: 2 per GF2

Figure 13:
Handles with pre-attached screws
Qty: 4 per GF2

2. Assembly instruction

2.1 General

The following clearances need to be followed when installing each GF2 unit:

Clearance	Values, in inches
Front	31
Side	8
Ceiling	3
Floor	36

Table 1: Clearance from combustible materials

The stated clearances are for combustible materials sensitive to surface temperature above 90°F (32°C). Building materials with a low heat tolerance (such as plastics, vinyl siding, canvas, tri-ply, etc.) may be subject to damage at lower temperatures. It is the installer's responsibility to assure that adjacent materials are protected from potential damage.

In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain the required clearances from the heater to the combustibles. Signs must be posted in an easily visible location.

The installation must conform with local building codes or, in the absence of local codes, with the *National Fuel Gas Code, ANSI Z223.2/NFPA 5*4 or the *Natural Gas and Propane Installation Code, CSA B149.1*.

The maximum inlet gas supply pressure is 10 PSI-G and the minimum inlet gas supply pressure is 65 "W.C. The manifold pressure is 65 "W.C. (=2.35psi)

2.2 Technical Requirements

Note: 1 X GF2 unit consisting of two catalytic heating heads.

1) **Electrical requirements & consumption per GF2 unit (2 catalytic heads):**
   - 220-240 Volts / 15 Amps per GF2 unit. (single phase)(individual circuit per unit)
   - Consumption 1.2 KW while preheating (15 minutes)
   - Consumption 0.8 KW while standby (Modulation)???????
   -
2) **Gas requirement & consumption Natural (NAT) or Propane (LPG).**
   - **NAT Gas** 13,500 BTUh / 4 KWh (X 2) = 27,500 BTUh / 8 KWh per GF2 unit.
   - **LPG Gas** 15,000 BTUh / 4.4 KWh (X 2) = 30,000 BTUh / 8.8 KWh per GF2 unit.

Gas pressure required NAT or LPG: 5 PSI / 0.344 Bar

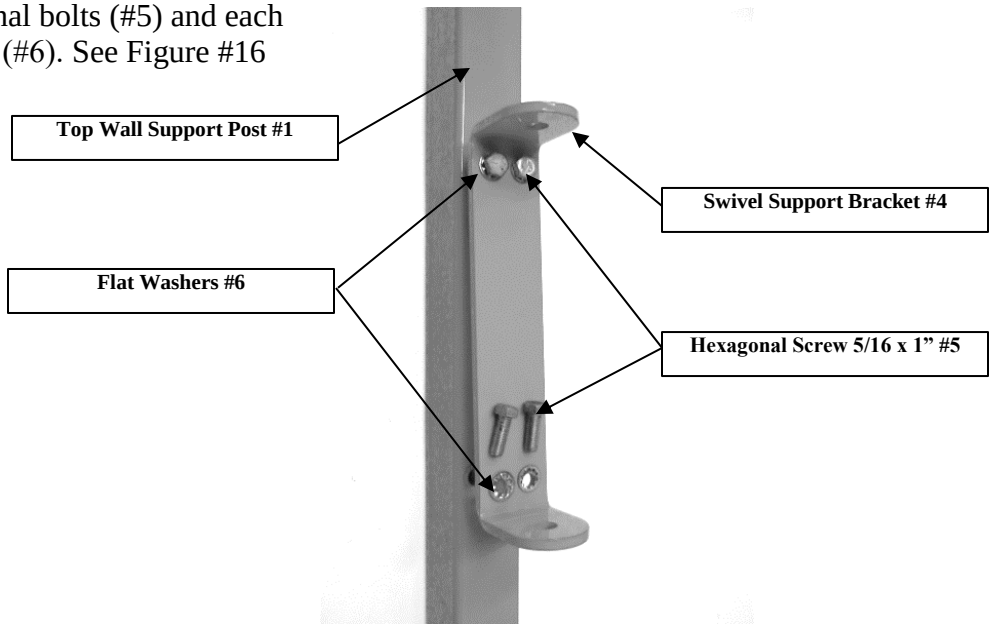
Note: We strongly recommend the use of LPG Propane Gas due to the pressure required.

2.3: Assembly of the Wall Post

Picture 14: Top and Bottom Wall Post Parts with pre attached connecting bracket and Hexagonal screws 5/16 x 1”

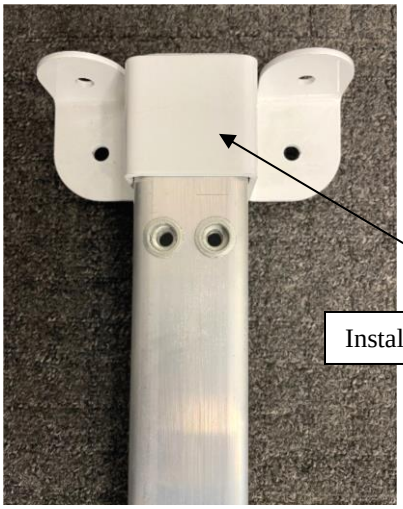
Picture 15: Inserting the pre attached connecting bracket of the bottom post into the top post.

1. Remove the top 5/16 x 1” Hexagonal Screw of the top preinstalled insertion bracket. (#15)
2. Insert the connecting bracket into the top wall post (#15).
3. Secure the top post with the bottom post by re-installing the 5/16 x 1” Hexagonal Screw removed in Step 1.
4. Install the two swivel support brackets (#4) at the desired heights onto the top wall post (#1) each with 4 pieces of 5/16 x 1” hexagonal bolts (#5) and each 4 flat washers 5/16” (#6). See Figure #16

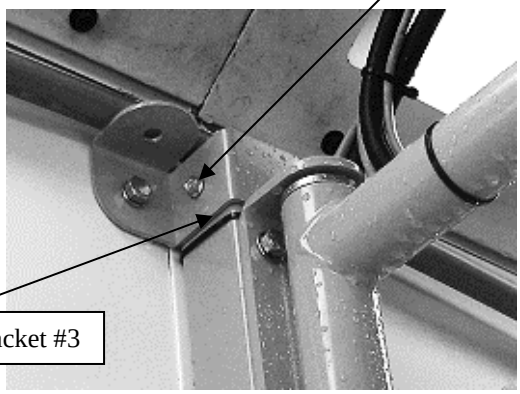


Picture 16: Installation of Swivel Support Brackets #4

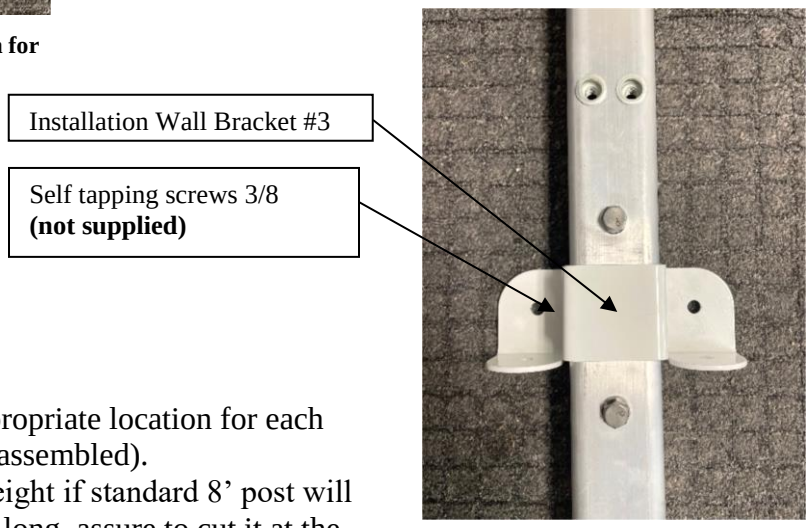
2.4: Installation of the wall post



Picture 17a: Top bracket location for



Picture 17b: Top bracket location for Wall Support Post

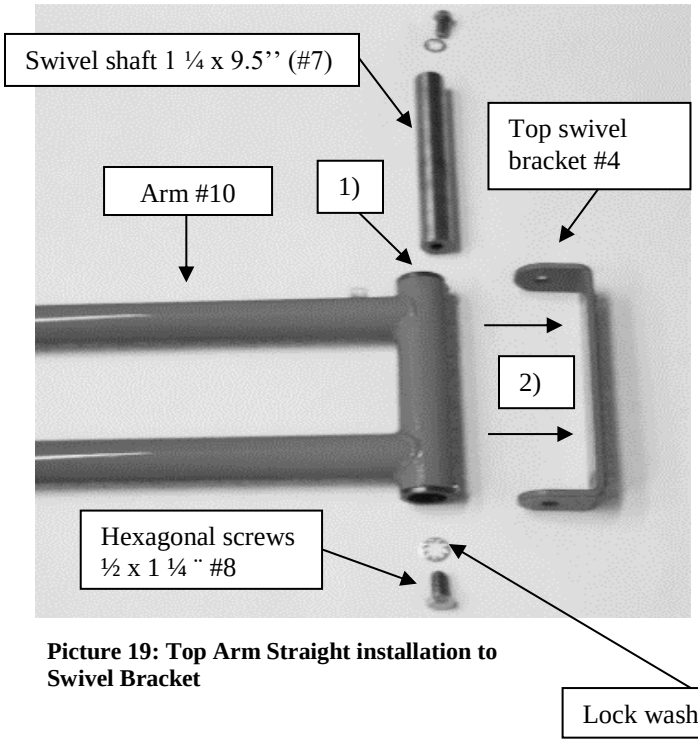


Picture 18: Center bracket location for post

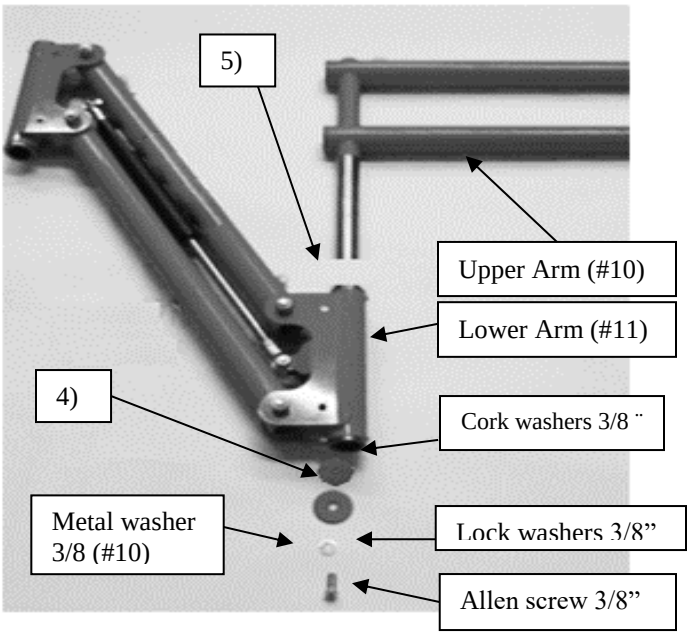
1. Locate the most appropriate location for each wall post (#1 and 2 assembled).
2. Check the ceiling height if standard 8' post will fit. If the post is too long, assure to cut it at the lower end of the post. (there are no attachment holes for the Swivel Brackets #4 on the lower post).
3. Install Wall Post Assembly with the help of the wall installation brackets (#3) (see Figure 17a, 17b and 18). **Ensure, that both wall installation brackets (#3) are well anchored to the wall. All the weight of the system is held in place by the two brackets. Ensure that wall post is secured.**
4. Attach both Wall Bracket (#3) to the Wall Support Post # 1 and 2 with a self-tapping 3/8" screw (not supplied) on each side.

2.5: Assembly and Installation of the Arm System

1) Insert swivel shaft (#7) into the straight upper arm (#10) (see Figure 19).
   Caution: Don't let the swivel shaft fall through!!
2) Slide arm with swivel shaft into top swivel support bracket (#4).
3) Install hex bolt ½ x 1 ¼" (#8) and lock washers ½ ¨ (#9) on each end of the swivel shaft.
4) Remove pre-attached 3/8" Allen screw, 3/8" lock washer, metal washer, and a cork washer out of the end of the Straight Swivel Arm #10 tip;
5) Insert arm #10 (Figure 19) into arm #11 and screw into place with the 3/8" Allen screw, preceded by a 3/8" lock washer, a metal washer, and a cork washer. Make sure the hydraulic arm is in the same direction as shown in Figure 20.
6) Repeat operation 2, 3 and 4 for the second arm



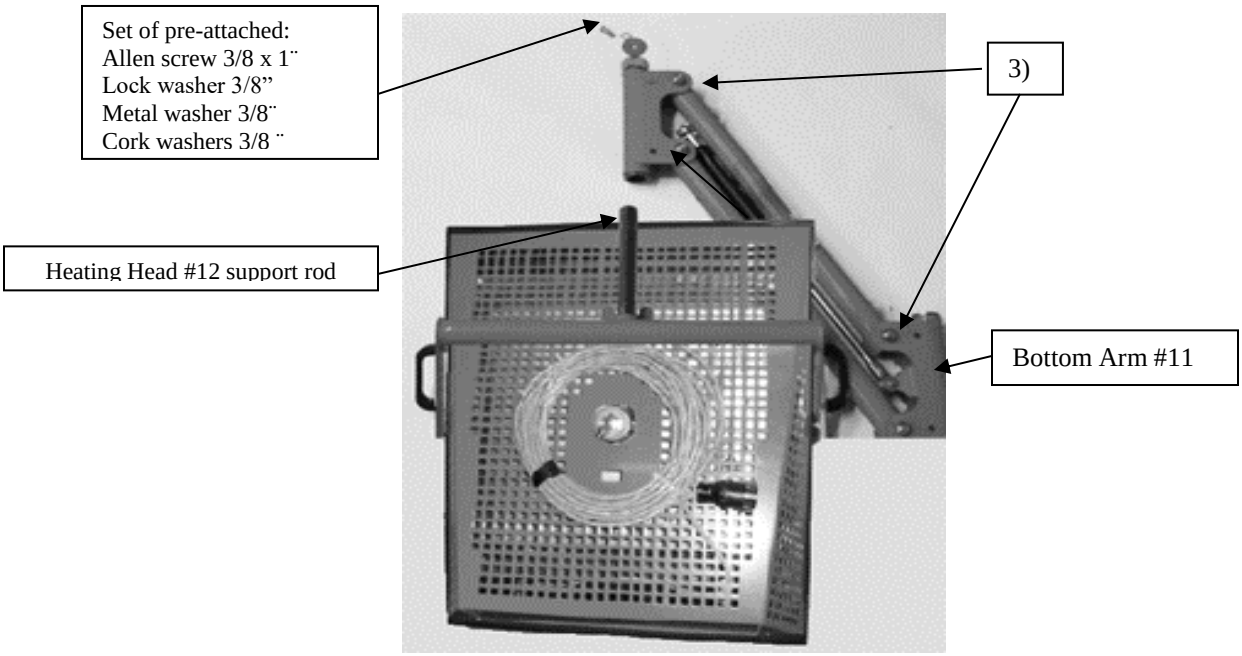
Picture 19: Top Arm Straight installation to Swivel Bracket



Picture 20: Lower Arm Assembly onto Top Arm

2.6: Installation of the heating heads

CAUTION: When holding the cylinder arm down in point 2) below for head bracket insertion, watch for pinch points and note that gas shocks are under pressure.

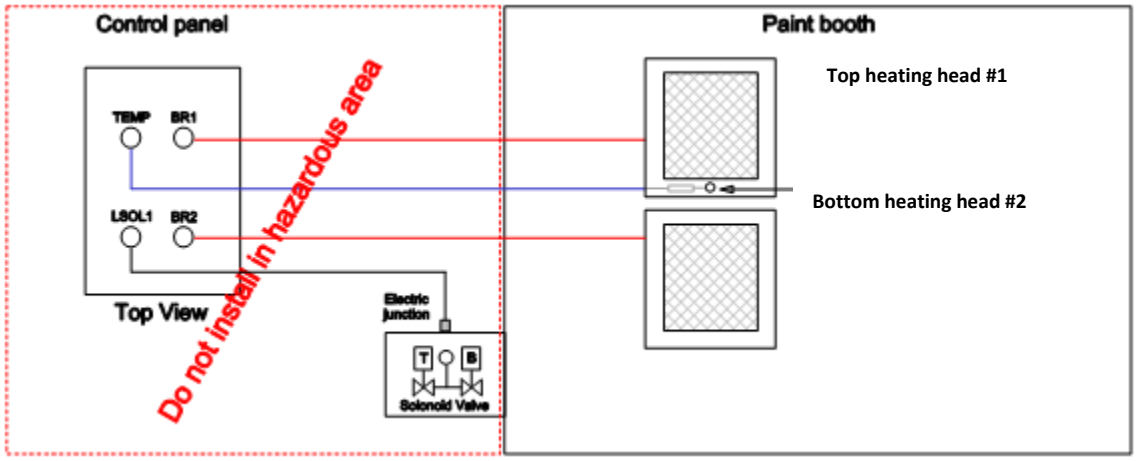


Picture 21: Heating head’s installation into Bottom Arm

1) Remove the Set of pre-attached Allen screw 3/8 x 1¨, Lock washer 3/8”, Metal washer 3/8¨ and Cork washers 3/8¨ from the tip of the Heating Head (#12) Support Rod
2) Slide the heating head support rod into the bottom of the cylinder of Bottom Arm #11. (Heating Head Face facing away from arm system)
3) Install the 3/8” cork washer, 3/8” metal washer, the lock washer and the 3/8” x 1” Allen Screw and secure the head to the bottom arm.
4) Tighten all 4 screws of the hydraulic arm (see Figure 21 above) In doing so, the heating head will keep its height and tilt position.

2.7: Wiring Diagram Electricity

1. Set location for the control panel(s) and solenoid Control(s) (Gas Train) outside of the batch oven or tunnel in an area the system can easily be operated and observed.
2. Group cables for each arm and unit.
3. For the control panel's connection please refer to the electric diagram.
4. Connect each control panel to an individual electrical circuit supplying 220V AC, 15A (Single Phase)(see also Page 6 Paragraph 2.2)

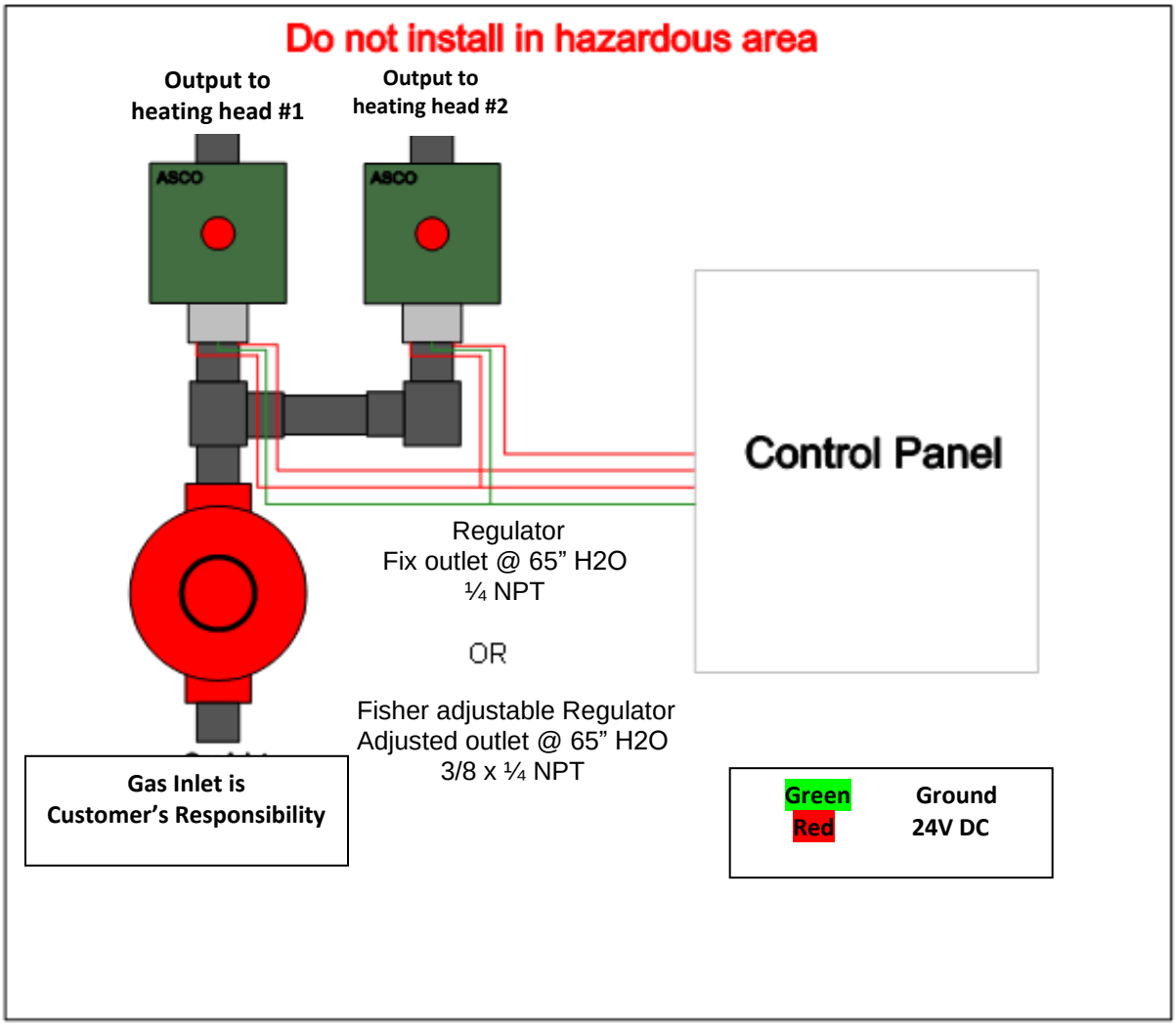


Picture 22: Electric Wiring diagram

Picture 23: Control Panel and Gas Train Installation Example; follow all Local installation codes

2.8: Wiring Diagram Solenoid / Gas Train

a) All wires and gas hoses (50 feet each) are supplied by the manufacturer to connect the heads to the solenoid/gas train and electric control panel.
b) Group all wires carefully by unit in order to avoid any stress or tension points.
c) Tie all wires in place with tie-wraps as shown in Step 2.9 (page 13)
d) see also Page 6 Paragraph 2.2 for gas and electrical requirements;

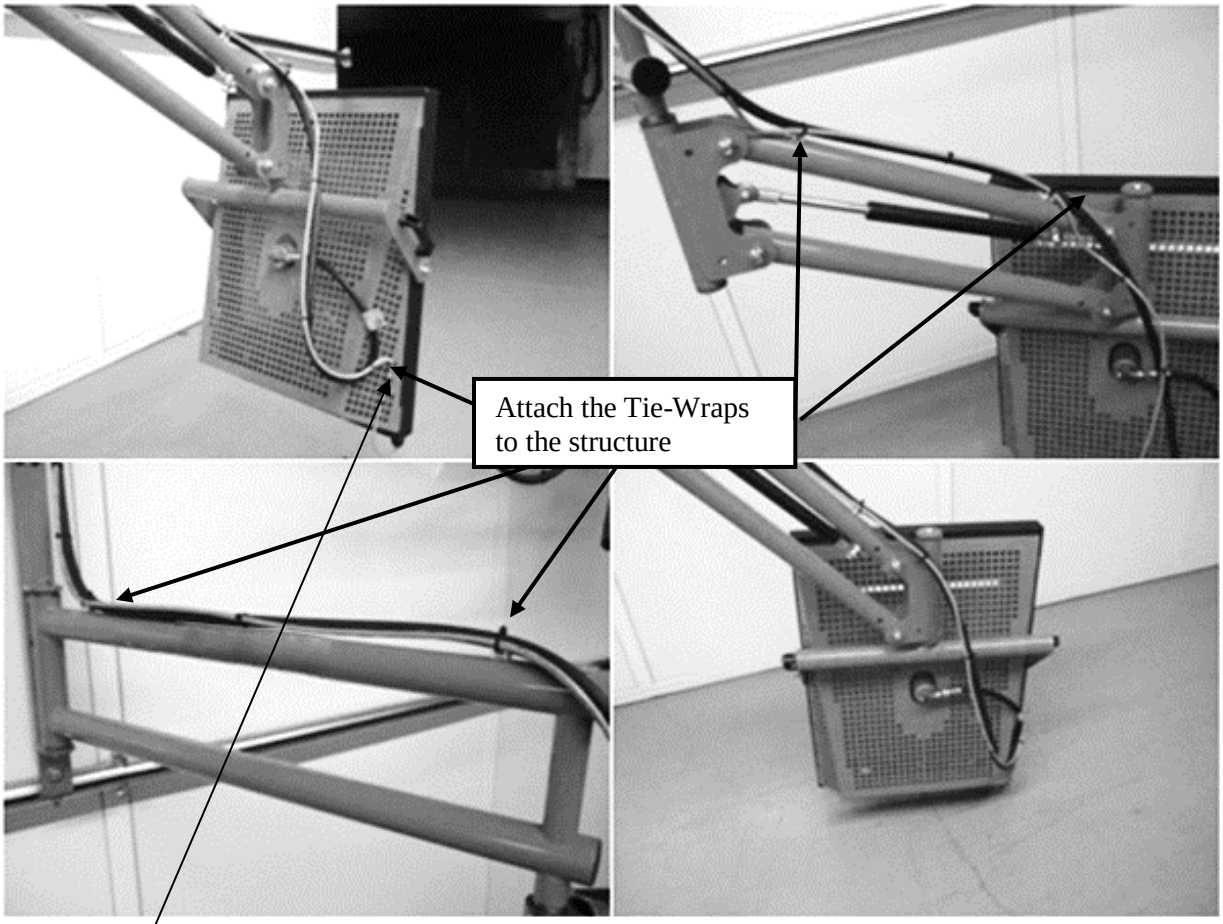


Picture 24: Solenoid GF2

2.9: Guiding and attaching cables and hoses to arm systems & heating heads.

a) Guiding and attaching the cables and hoses to the arms and heating heads as shown below. Make sure to leave some extra flex/length between moving parts to get the full flexibility of the system. DO NOT fully tighten zip ties until the full length of the cables and hoses are installed and enough flexibility is built in.
b) Tie all wires in place about every 6 inches or less (see picture) with zip-ties.
c) After complete assembly and installation of system and a full exercise of motion of each arm, snug tied all zip-ties and clip the ends off.

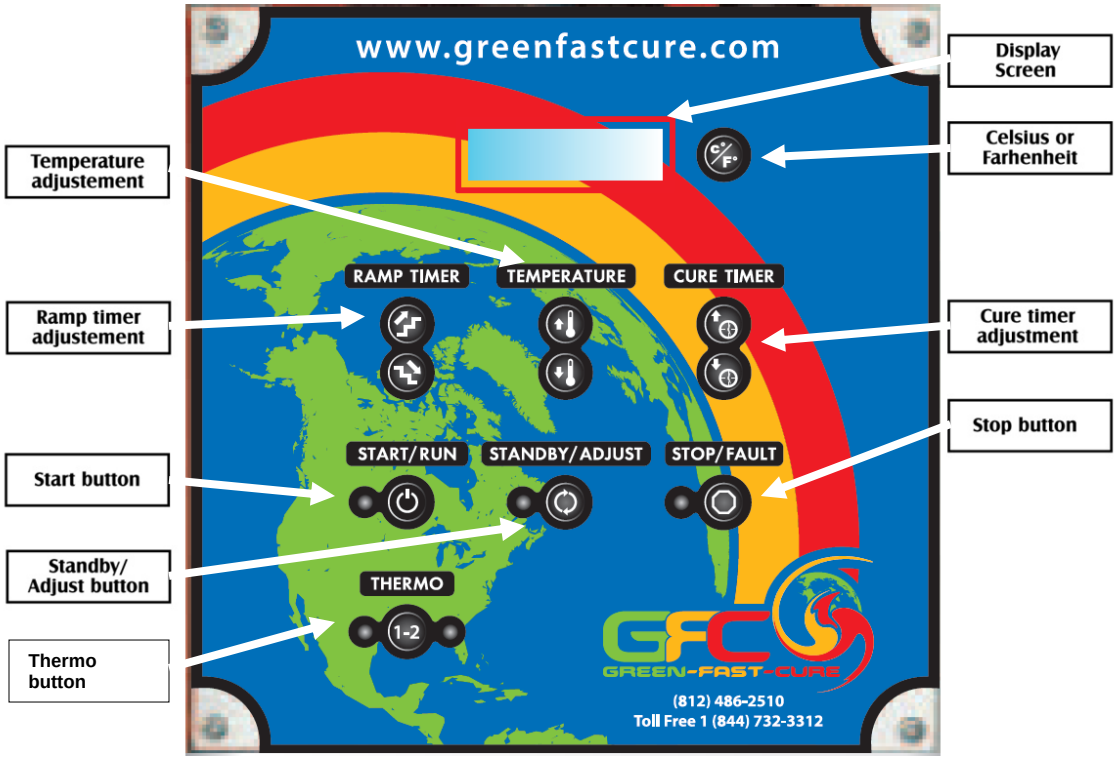
WARNING
Do not over tighten zip ties along gas hoses (pinch points)
Do not tie down cables and hoses to any hot surfaces parts or sharp metal edges.
Line all wires and hoses up to avoid any stress or tensions points.



Picture 25: Cable and Hose attachment to arm system and heating heads

Note: By pre-bending the ends of the Zip-Ties, it will be easier to insert it through the back of the heating head structure and loop it out on is way out.

3. Control buttons and lights description



Picture 26: Control Panel

3.1 START/RUN button: Push to start the unit.

-Green light flashing: the unit is in starting sequence.
-Green light solid: the unit is in running mode.

3.2 STANDBY/ADJUST button: Pressing this button once puts the unit in standby mode. In this mode, the unit maintains the necessary temperature to be able to start the unit again without going through the complete 15 minute start up cycle.

-Yellow light solid: Means the unit is in standby mode.
-Yellow light blinking: means the unit is in adjustment mode.

3.3 STOP/FAULT button: Press and hold to stop the unit.

-When the unit is in preheat phase, just press to stop to shut it down.
-When the unit is in operating mode, press and hold the stop button for 5 seconds to shut down the equipment.

-Red light Solid: means the unit is stopped.
-Red light blinking: means the unit is in fault condition.

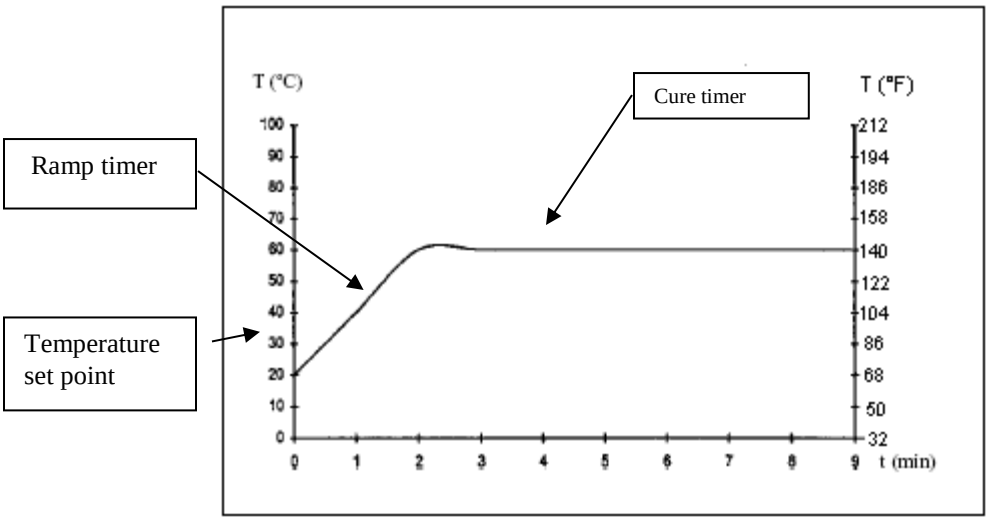
3.4 RAMP TIMER button: adjusts the ramp time from 0 to 30 minutes. Ramp means the time that the unit will need to reach the temperature set point.

3.5 TEMPERATURE button: Adjust the temperature set point from 70°F (20°C) to 425°F (220°C). The upper value may vary substantially due to different radiant properties of the material.

3.6 CURE TIMER button: Adjust the curing time from 0 to 500 minutes or beyond to infinity (∞) to run until manual shut off.

3.7 THERMO button: Choose to operate with 1 or 2 heating heads. The green light(s) indicate whether 1 or 2 heating head(s) will be in use.

Example: We demonstrate a ramp time of 2 minutes, a curing time of 7 minutes with the temperature set at 140°F (60°C).



Picture 27: Graphic of an example of ramp and cure time

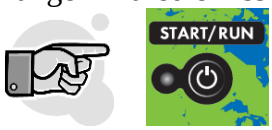
4. Start Up Instructions

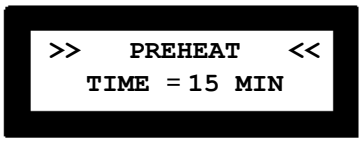
4.1 Open the gas valve and check for leakage.

4.2 The red light left of the STOP/FAULT button indicates power to the unit. It shows the unit is stopped and the actual temperature. This screen is also shown when pushing the stop button for 3 seconds.

4.3 To change the display language between French and English, press and hold the Standby Button, and press on the Thermo Button.

4.4 Press the start/run button to start the 15 minute pre-heat cycle and wait for it to count down and complete. The catalytic pad must be preheated before injecting gas. The pad has to be at the right temperature to produce an oxidation reaction with the gas, which produces a flameless medium range infrared emission.





4.5 After the 15 minute warm up, the unit shuts down the electric heating element and opens up the gas valve solenoid for 30 seconds for a complete system check.

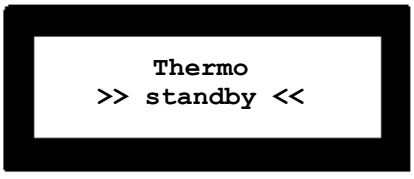
4.6 Adjust the heating head positions and set at the desired distances. 4-6 feet is recommended.

4.7 Choose to operate with 1 or 2 heating heads by using the Thermo Button.

4.8 To change the language of the interface, press and hold the Standby Button, and press on the Thermo Button to switch between French and English.

4.9 To completely shut off the unit, press and hold the Stop Button for 5 seconds. To start up the unit again, you will have to go through the complete pre-heat cycle again.

4.10 At the end of the pre-heat and complete System Check cycle the display will switch into Standby Mode, ready for operation.



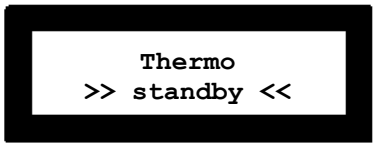
4.11 There are two options how to operate the GF2. With Thermal Probe (camera) (see page 17 section 5.) or without Thermal Probe (see page 18 Section 6.)

5. Programming and starting sequence with Probe (Thermal Camera)

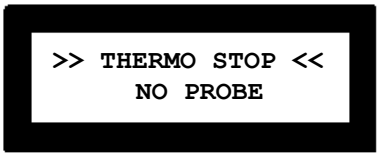
5.1 Execute all steps in Chapter 4. The unit is ready to operate;

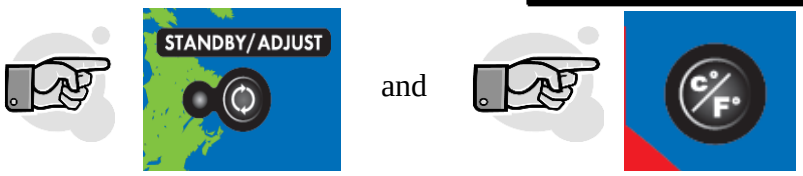
5.2 To use the Probe (Thermal Camera) you need to have a continuous surface of 16" diameter at a 4 foot distance to read. If your process does not allow for that, please proceed to Chapter 6 to operate without Probe.

5.3 The screen should display the Standby screen.

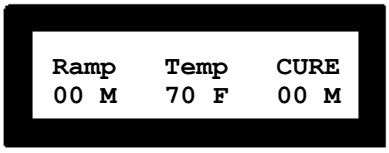


5.3 In case you want to operate with thermal camera, and the screen displays Thermo Stop No Probe, you need to convert back to Thermal Camera Operation Mode by pushing the Standby and C/F° Buttons simultaneously.

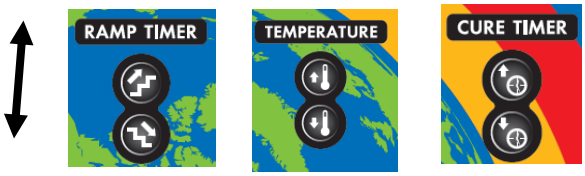




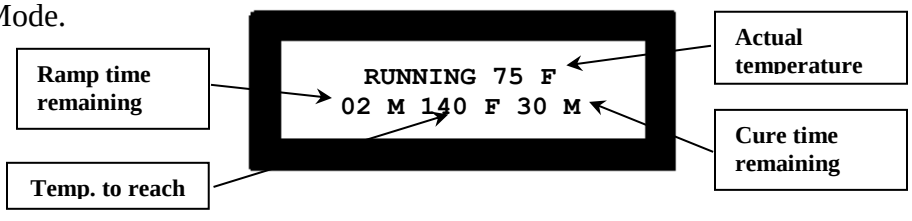
5.4 For operating your unit with Probe, you need to program the necessary settings. Push and hold the Standby Button. The Screen Changes to:



5.5 Adjustment Mode: While continue to hold the Standby Button, use the Ramp, Temp and Cure Buttons to adjust to the settings required.
Release the Standby Button.
Your unit is ready to operate.



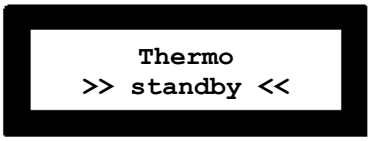
5.6 Push the Start Button and the unit will go through the preset cycle as shown as an example below. Ramping up the temperature for 2 minutes to 140 degrees with a total cycle time of 30 minutes. At the end of the 30 minute cycle time, the unit will automatically go into Standby Mode.



5.7 Repeat Step 5.6 or 5.5 as needed throughout the day.

6. Programming and starting sequence without Probe

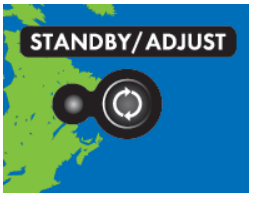
6.1 Execute all steps in Chapter 4. The unit is ready to operate;
6.2 The screen will display the Standby Mode.

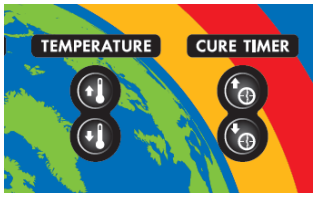


6.3 To operate with No Probe (without thermal camera), push the Standby and C/F° Buttons simultaneously. The No Probe screen will appear.

and

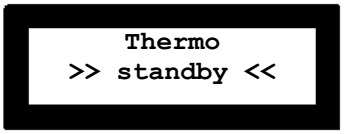
6.4 Push and hold the Standby /Adjust Button for 3-4 seconds till the display screen starts blinking; continue holding the Standby / Adjust Button; adjust the % of power and the run time from 1–500 minutes by using the Temperature and Cure Time Up (or Down) arrows . Past the 500 Minutes, the system will display info ∞, for infinite mode. **The Thermo will run until manually shut off!**





6.5 Start the system by pushing the START/RUN button. The unit will go through the preset cycle as shown as an example below. 15 minutes @ 50%. At the end of the 15 minute cycle time, the unit will automatically go into Standby Mode until newly started.

6.6 Stand-By Mode: Pressing the standby button shows the following screen and reduces the gas flow to minimum amount to maintain the right start up temperature with the heating element. Thus you won't need to wait 15 minutes to pre-heat the unit again.



7. Operating multiple GF2 units from a Central Control Panel

7.1 When more than one GF2 needs to be operated, a Central Control Panel is recommended to operate from one location rather than multiple Control Panels. Instructions are provided separately, as each installation will be different with varying amount of GF2 units and potentially linkage to conveyor systems, visual, audio or digital signals etc.

8. Maintenance

When the unit has cooled place the unit at waist level with the heating head facing down., To remove dust on the screen, gently tap around the body. Remove dust on the metal surfaces using a soft cloth.

To remove paint spray accumulation on the heating head face, operate the unit; face down, for 30 minutes at high output. Allow the unit to cool in this position and, when cold, repeat the dust removal procedures outlined above.

Service and maintenance must be performed only by staff trained, qualified, and authorized by Green Fast Cure LLC.

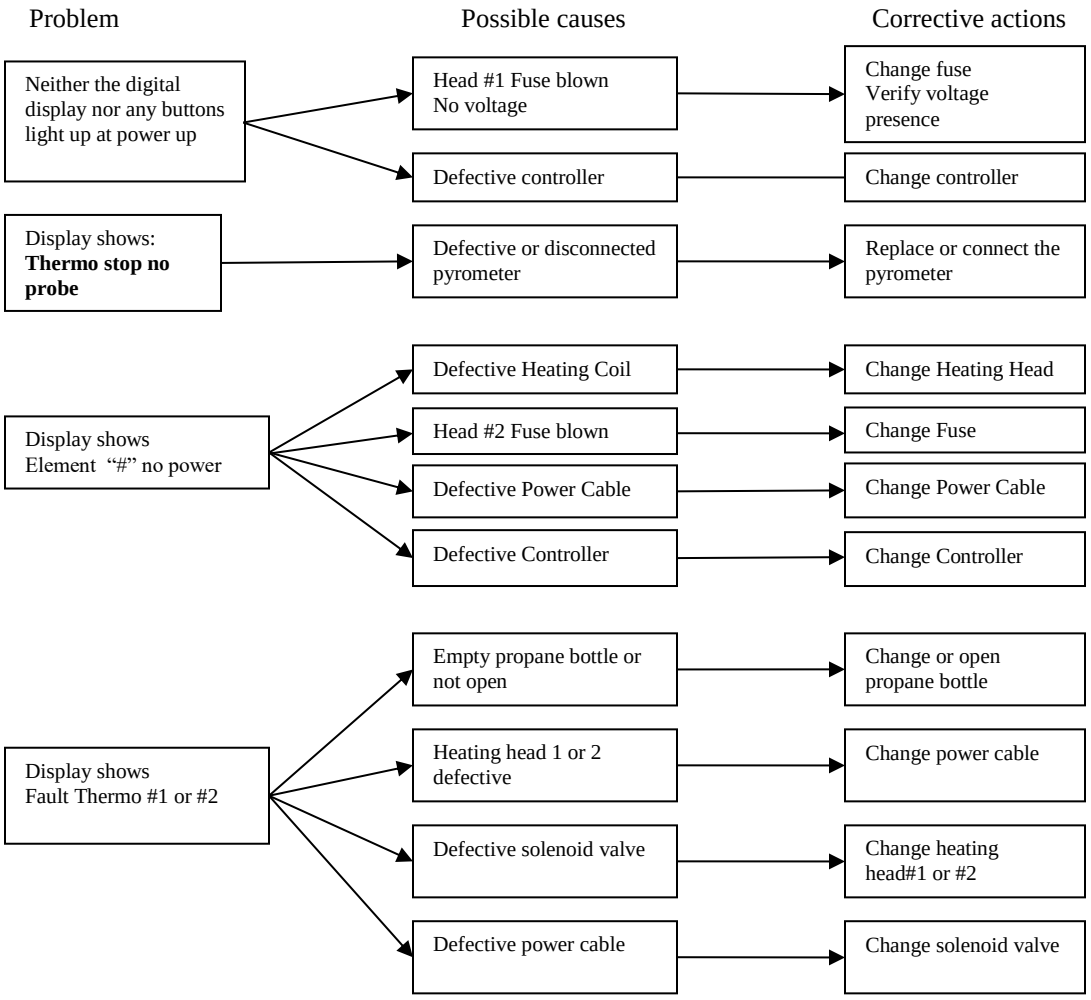
No intervention inside the equipment shall be made without prior written consent of Green Fast Cure LLC.

No alteration to the programming logic of the equipment shall be made without prior written consent of Green Fast Cure LLC

The owner agrees to set up a service log book and a copy should be sent to Green Fast Cure LLC

Perform a visual inspection every day before the start of the unit.

9. Troubleshooting



Picture 28: Troubleshooting

10. Hazards

10.1 Electrical equipment: The equipment operates with dangerous electrical voltage. Only a professional electrician may work with the electrical equipment. If operations on electrical equipment have to be carried out:
-Disconnect the unit from the main power source.
-Contact a professional electrician.

10.2 Contact heat and radiated heat: The equipment is hot to the touch (contact heat) and radiates intense heat (radiated heat). Hands, face and other body parts should not be exposed to the contact heat or radiated heat.
Operator exposed to the contact heat or radiated heat must wear heat resistant gloves, garments, face protection and any other protection necessary.

10.3 Disclaimer to owner: The owner of the unit is obliged (?; obligated?), taking into account the manual and the conditions which prevail at the workplace, to produce clear and concise directions for the use of the curing system or get training for the operators by Green Fast Cure LLC.

Installation is the responsibility of the owner. Make sure to respect all local laws and regulations.

10.4 Natural- or Propane Gas Installation: Determining the type of gas (Natural or Propane) will be used by Customer needs to be submitted with the Purchase Order. Changing it from one type of gas to the other will require different gas trains / solenoids and injectors. It is the customer's responsibility to pay for any cost to change over or due to damage on the unit running them on different gas than designed for. Only make changes by contacting the Manufacturer

11. Warning:

- Under no circumstance should a blow gun or spray gun be directed into the face of the heating head face. Doing so will rupture the catalytic pad.
- Under no circumstance rinse or expose the heating head to water or any other liquid.
- Never blow air at the heating head screen.
- Never brush the surface of the heating head.
- Hot surface: do not touch the heating head screens when they are in operation.

- The heating head panel may rotate about swivel arms watch out for all moving parts.

- Don’t install solenoid and control panel in a potentially explosive location or close to a heat source higher than 140° F (60° C).

- Maximum working temperature 180° F (82° C) when systems are installed inside an enclosure (oven, batch-oven, drying room or else).

- Do not clean the GF2 heating heads with water or any other product.

10. Warranty

One year (on a fixed location) or 2000 hours (otherwise) on parts only subject to use of appropriate fluids and provided that the installation (equipment) is used and maintained according to our instructions, including the following:

- Electrical supply varying between –5 to + 5% of rated voltage without micro power failures.

- Combustible supply for propane (LPG) gas or natural (NAT) with properties close to reference values, and free of methanol, olefins, propylene, with at least 25% of the tank filled.

- Operation in compatible atmospheres, e.g. never used in air saturated with silicones, halogens, hydrogen, acids or corrosive fumes, or non-flammable dusts (mineral and metallic).

- Adhering to suitable usage rates;
- Regular inspections of equipment and liquid flows with calibrated instruments.