



## DryAir Troubleshooting Guide Riello G900 Burners

The following document is regarding the Riello G-900 burners used in Dryair Manufacturing Hydronic Heating Units (CHU, HHP, HCP)

The reason for this service sheet is to understand the gas burners more and to know what to do if an intermittent lock out should occur.

In all our units, the burners will be set up the same for all the 900,000 Btu heaters. These heaters include the 900 & 1800 CHU, 900 GTS Flex, Heat Center Pro and the Hydro Heat Pro.

**What happens when a burner locks out?** When a lock out occurs, the burner ceases operation until it is manually reset. A Red light on the burner control means that the burner has seen a fault.



*G-900 Burner*



In the case of a fault (red light), the first step should always be to check the fault code. The “fault code” can be checked by holding the red button on the burner for 5 seconds. The burner will then blink a series of red blinks. The number of blinks will determine what part of the firing process the burner was in when lock out occurred.

In most cases the codes will be one of the following:

**2- blinks** = fault during ignition

**3-blinks** = air pressure sensor

**7- blinks** = fault during operation

First step in checking the unit would be to verify that the gas supply is correct for the burner and gas train settings. Propane and natural gas settings are different. Also check that the unit has proper gas supply pressure (correct pressure to unit is 12-14”wc with burner(s) running. Please note that with the burners off, the pressure would show higher on the supply pressure gauge.

Second step is checking input gas setting into the burner(s) should be 4.8”wc for natural gas and 5.2”wc for propane. This has to be set with the burner(s) running and can be adjusted by turning the regulator in or out. On units with two burners, check that when the second burner lights that the input pressure into first burner does not drop. A drop in pressure means the unit is not supplied with an adequate amount of gas.



*Pressure Adjustment Regulator*



Third step would be to check the burner and gas train settings and controls.

## **BURNER SETTINGS**

The burner setting should be that same for every G-900 burner with the exception of a high elevation set up. For high elevation set up contact DryAir Service for assistance.

### **1. Setting the Servo Motor;**



*Servo Motor (on side of burner)*

There are 5 settings on the servo motor:

**ST-1** = 30 (propane) 20 Nat gas. (low fire air settings)

**ST-0** = 0 (minimum air setting)

This setting should never be changed and currently has no function to the burner in DryAir setup.



**ST-2 = 70** (hi fire air setting for both nat gas and propane)

This setting should be the same and never need to be changed as the air is completely open at this setting. Only time changes to this may be made is for “high elevation” set ups.

**N-3 = 25** (originally was 40) for Nat gas and 40 for Propane (hi fire gas)

This setting was changed to allow for a smoother transition between low and hi fire. This is not how much gas the unit gets but a timing between the gas valve and air shutter. This setting should never change.

**N-5= 10** for both fuels (low fire gas)

If your servo motor settings differ from the above settings, please take the time to change them to the factory settings listed above.

**The following applies to setting the ST1 on the natural gas burners only to allow easier lighting.**

This setting is best done when bypassing the burner so that it stays in low fire (lighting stage). The burner lights in low fire, then after 3-5 seconds cycles up to high fire. To make the burner stay on low fire after firing, remove the jumper wire between 7-8 on the burner terminal strip. Once jumper is removed turn ST-1 down to 15. Restart the burner. When the burner lights you will notice a distinct rumbling from the heater. The rumble should be easily noticed. Once running, turn the ST-1 up slightly to lessen the rumble. **DO NOT go over 20**. Once the rumble is reduced, you can then install the jumper wire between 7 and 8 on the burner. Setting the low fire this way makes lighting much easier. **(NOTE SOME RUMBLING IS BETTER THAN NO RUMBLE)**



## 2. Adjusting the Turbulator Head;



The turbulator head should be set the same for all units. The turbulator should be pushed as far in as possible (5). This will be the same for propane and natural gas.

To see the turbulator you must loosen the **13mm nut** that splits the burner from the turbulator.



*13mm nut*



*burner swings out remove wires*



Once burner is swung out you can remove the two wires that are connected inside. Using a Allan wrench, loosen and remove the bolt holding the turbulator in the burner tube. Once removed you can pull the turbulator out.



*Removing the Turbulator*

Once turbulator is removed, you can check the orifice to make sure it is correct for the fuel being used. Natural gas is 3.7 and propane is 2.0. The orifice number will be stamped on the end of the orifice. There should also be a spacer washer in place for the propane orifice only.



*Burner orifice*



*Propane orifice with spacer*

The Propane spacer should be placed in between the gas tube and the burner head. You must split them by removing the burner orifice and installing the spacer then re-installing the orifice. **Be sure that the ionization probe and spark probe are in the correct position after tightening the orifice.**



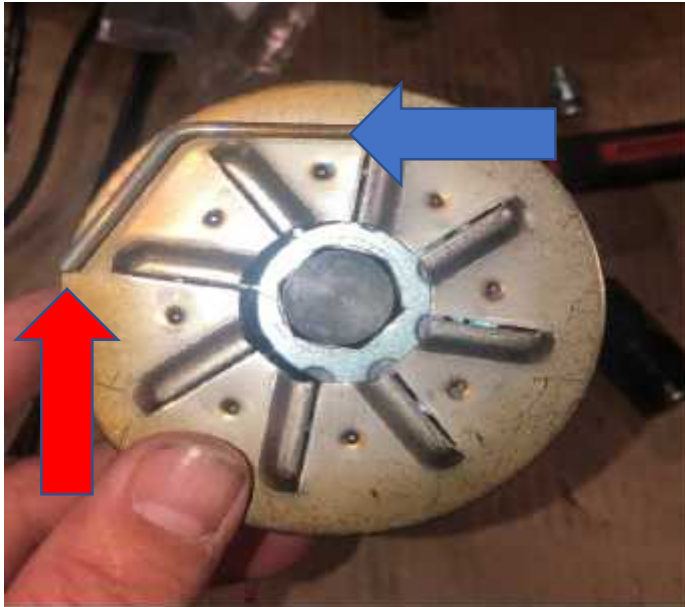
*Split Burner Turbulator head*



*Insert Spacer Washer (propane orifice)*

When ensuring that the probes are in the correct position, be sure that the ionization probe is centered in the hole on the end plate (this probe is the one that goes through the end plate). Also be sure that the tip of the probe is flush with the outer edge of the plate. Also the spacing between plate and the probe should be 3/16".



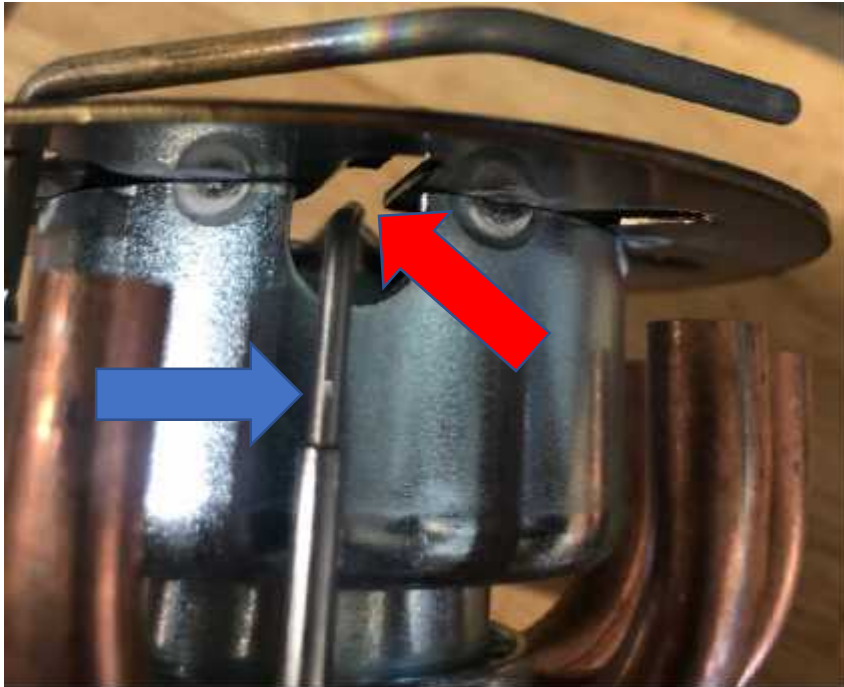


*Ionization Probe (centered in hole and tip flush with outside edge)*



*Spacing between probe and plate 3/16"*

The other probe on the turbulator is the spark/ ignition probe. This is the probe that lights the burner. This probe should be centered in the opening and approx. 1/8" from the plate. The probe should be turned slightly toward the plate to achieve the spacing.



*Ignition Probe (spacing between plate 1/8")*

Once probes are in position, tighten the screw that holds them in place. Do not over tighten as they can be cracked if tightened too tight. Once tightened, you can now re-install the turbulator back into the tube. Make sure turbulator is pushed as far in as possible. Before tightening the turbulator in place.

This is a good time to check the wires that attach to the turbulator probes for deformation or imperfections. When closing the tube and burner back together make sure that the wires do not get caught. Pinching the wires between the plates will cause a fault. Pull wires back slightly when swinging burner closed so they do not get caught when closing the burner.



## GAS PRESSURE SWITCHES



*Gas Pressure Switch*

There are two gas pressure switches on all units that use the G-900 Burner. One of the switches is for “low gas pressure” and should be set at 1. It is always the first switch on the gas train usually attached to the safety valve. This switch will cut out when the supply gas pressure is too low. The second switch is “hi gas pressure” and should be set at 7. This switch will cut out if there is a jump in gas pressure higher than the setting. In the possibility of one of the two switches cutting out, your burner will go through the pre-purge then lock out and you will not hear the safety valve snap open. (it’s a distinct snap and is easily heard when it snaps). If you hear the snap, it is not the gas pressure switches that have tripped. On the 900 CHU and 900 GTS Flex units, the gas



pressure switches will turn off the aquastat and burner lights on the control panel and burner will have no lights on burner control.

## Checking the Fault Codes

### 2 Blink Code

If a two-blink red light code is to appear you should check the following; **(Note: reset burner after checking each of the following to see what faulted the burner)**

1. Gas pressure switches have been tripped. Press the red reset button. When burner is reset, the burner should go into pre-purge. At the end of the pre purge, you should here the click of the main valve if the gas pressure switches are not tripped out. If tripped, press the reset buttons on top of the hi/low gas pressure switch and reset burner again.
2. Check the settings of the Servo Motor on the side of the burner and set to factory settings.
3. Check main gas supply pressure for correct pressure. Note that if burners are not running input pressure will be higher than normal. With the burner/burners running you should see 14" w.c..
4. Split the burner from tube and check the turbulator settings (see instructions). If these settings are out of spec, intermittent faults of the burner can occur.



5. Check the ignition wire and high voltage cable (ionization wire) for deformation. If damaged replace wire.
6. Check for power between terminal 11 and 12 on the burner wiring. **You will not see power until the burner has gone through the pre purge. You will only see power for a few seconds if the burner goes into lockout again.** If there is no power, check for power between 0 and 10 on the servo motor. If no power is present, replace primary control on burner. If power is present, check for power between 0 and 7 on the servo motor. If no power is present, replace servo motor. **Please note that the numbers are not in order on the servo motor.** If you see power between 11 and 12 on the burner check to see if main valve is moving, there is a sight glass on the side of the burner. You will hear the safety valve click and the main valve should start to move downward. You can also check to power between 1 and 2 on the main valve to see if you have power. If there is power and main valve does not move, change main valve motor. If there is no power between 1 and 2 on the main valve but there is power between 11 and 12 on the burner, one of the two gas pressure switches is tripped. Reset. And try again. If still no power between 1 and 2 check to see which gas pressure switch is not working and replace. If gas valve is moving, check ignition transformer for power out. If no power replace transformer.



7. If the burner fires, check gas pressure into the burner, 4.8" w.c. for natural gas and 5.2" wc for propane. This can be adjusted by turning secondary regulator (each burner has its own regulator on gas train) either in or out depending on what pressure is. On units with two burners, make sure that the pressure does not drop on one burner when the other lights. If this happens your supply gas is not adequate. **Adjustments must be made with both burners operating on high fire.**
  
8. You may be required to reset burner a few times to restart to get fuel purged through the gas line.

### **3 Blink Code**

The 3-blink code means that the air pressure sensor does not have sufficient air to open the sensor. Check the following:

1. Remove the burner cover. Check that the air damper on right side of the burner is tight. There is a set screw that holds the air damper onto the servo motor shaft.
  
2. Make sure nothing is blocking the air damper. Sometimes if the burner cover is not installed properly, the insulation may jam in between the air damper and the burner not allowing the air damper to move.



3. Hit the reset on the burner to start the pre purge. The air damper should open all the way open then close to approximately a two on the air damper scale.
4. You can also check for 120V power into the air pressure sensor. If there is power in and no power out, the sensor has faulted and is either faulty or burner is not sensing enough air movement through the burner. If no power in and primary control displays an amber light, replace the primary control.

## **7 Blink Code**

The 7-blink code means that the burner faulted during the firing process. In most cases the cause of a 7 blink code is one of the following:

1. Check high gas pressure switch, if the gas pressure spiked higher than the setting it can fault the system.
2. Incorrectly adjusted ionization probe, check for proper settings (see instructions)
3. Improper fuel to air mix. Check settings on the servo motor. Also check that the proper fuel pressure is being supplied.
4. Defective flame detection circuit (replace the primary control)



We hope that this document will give you, the customer, a better understanding on how the Riello G-900 burners function.

**For more assistance please call DryAir Service  
Department at 1-888-750-1700 or 1-306-275-4848.**