

# The Ruby Street™ Digital Control



## Owners Manual

Mod# GF3VC12

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# Introduction

Thank You for purchasing The Ruby Street Digital Control System

Our controllers are hand built using high quality components and materials. With proper use and care, this equipment will provide many years of outstanding performance.

## NOTICE!

Please review this manual in its entirety prior to any operation of this equipment

Failure to follow all manufacturer's instructions could result in serious personal injury and/or property damage.

Ruby Street Brewing, LLC assumes no responsibility for personal injury or property damage sustained by or through the use of this product.

If you have any questions or need assistance please contact us at:

Ruby Street Brewing, LLC  
Fort Collins, CO

Email:

[Questions@RubyStreetBrewing.com](mailto:Questions@RubyStreetBrewing.com)

## SAVE THESE INSTRUCTIONS

# Safety Instructions



**WARNING:** To Reduce the risk of serious injury, read the following important precautions before using the digital control system

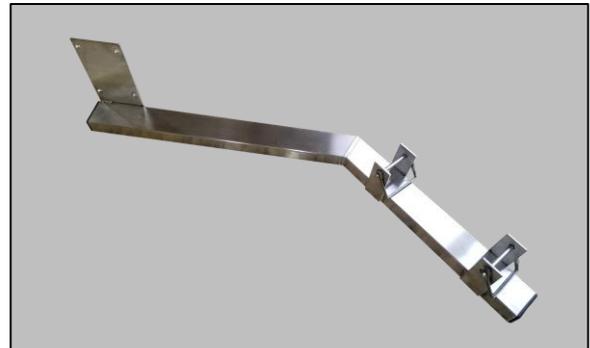
- It is the responsibility of the owner to ensure that all users of this equipment are adequately informed of all precautions.
- Use this equipment as described in this manual, do not use for anything other than its intended purpose.
- Inspect all equipment, cords, connectors, and sensor probes before each use. Replace any parts that are worn or damaged immediately.
- Keep children and pets away from this equipment during use.
- **DANGER! Water and Electricity Do Not Mix...** Make sure that the digital control system is plugged into a GFCI protected circuit. If in doubt consult a licensed electrician before using.
- Never place anything other than brewing kettles on the brewery frame when the digital control system is plugged in.
- The digital controller is designed to automatically ignite the system burners without warning based on temperature feedback from the sensors. Never reach into the burner area, lean over the frame, or attempt to adjust electrodes unless the digital controller is unplugged and all gas valves are in the off position.
- Do not leave system unattended at any time during operation.
- Always make sure that all controller switches are in the OFF position, and that all gas valves are turned off before connecting brewery to fuel source.
- Always make sure that all controller switches are in the OFF position and that the system is unplugged when connecting the digital controller cable to the ignition control box.
- Always make sure that all controller switches and gas valves are in the OFF position when plugging in the control system.
- Never heat an empty kettle! This will cause damage to the kettle and other components.

# Digital Controller Overview

Familiarize yourself with all system components prior to assembly



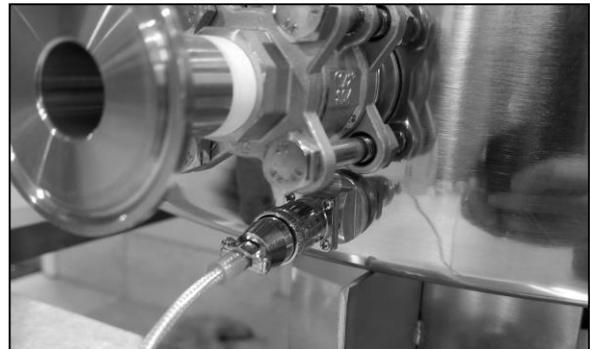
Control Panel



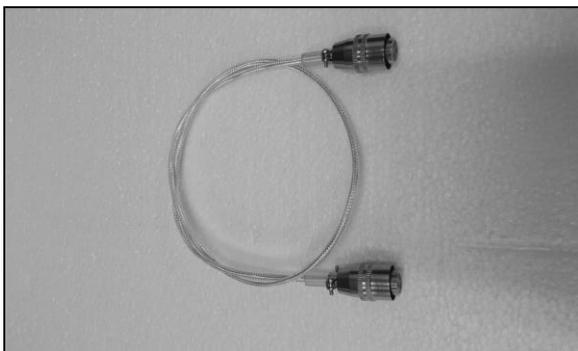
Control Panel Bracket



Sensor Probe (pump)



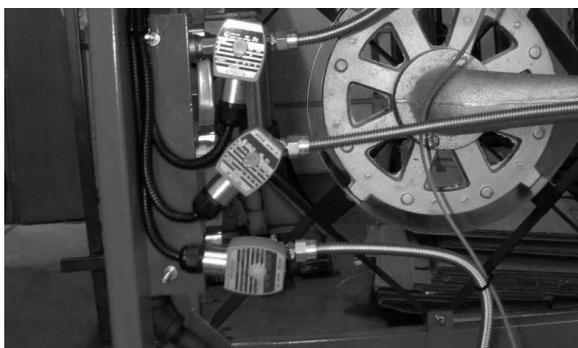
Sensor Probe (HLT)



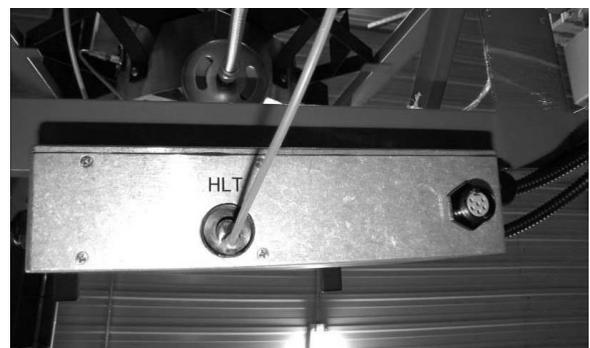
Sensor Cable (2)



Electrode (3)

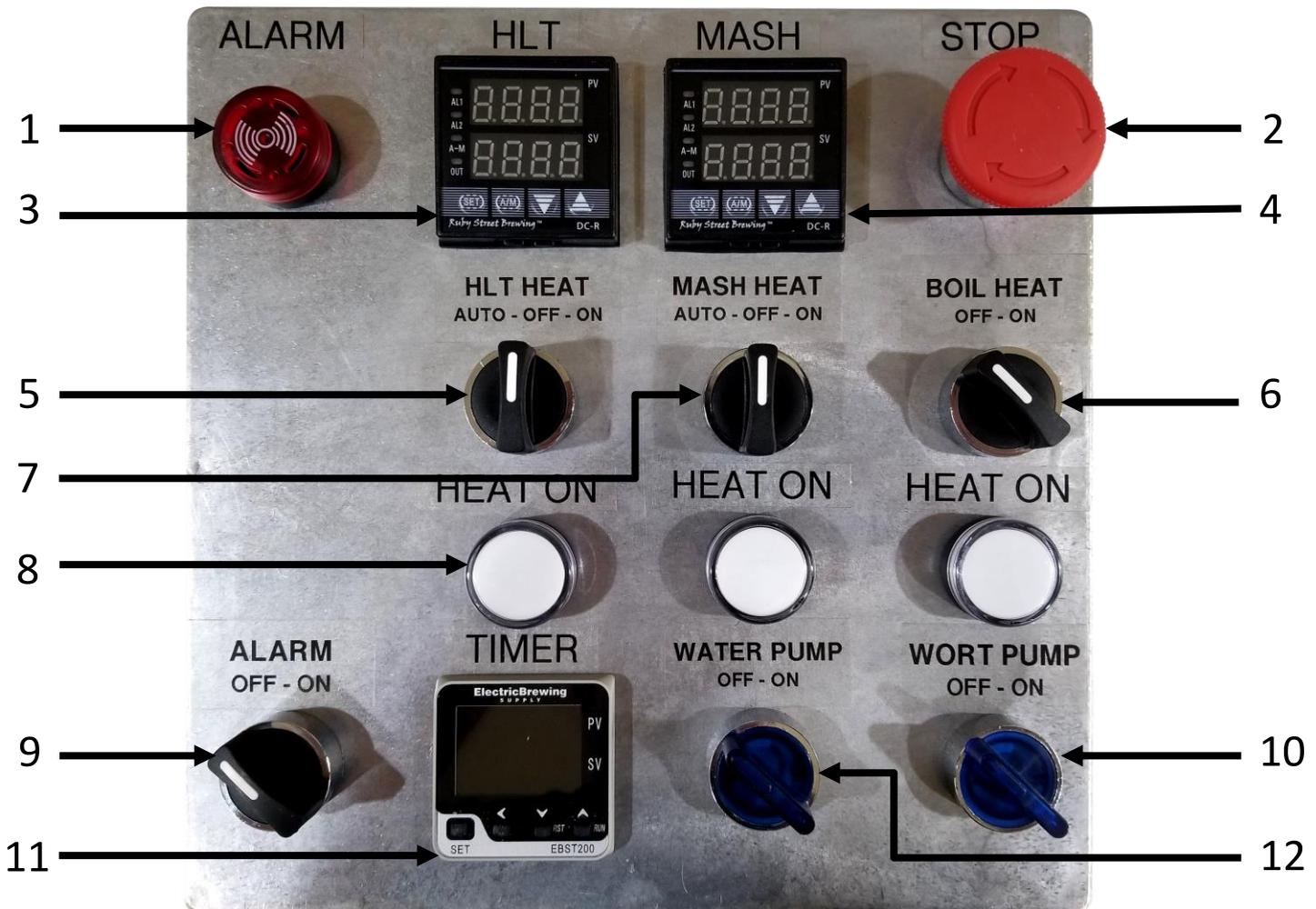


Solenoid Valves (3)



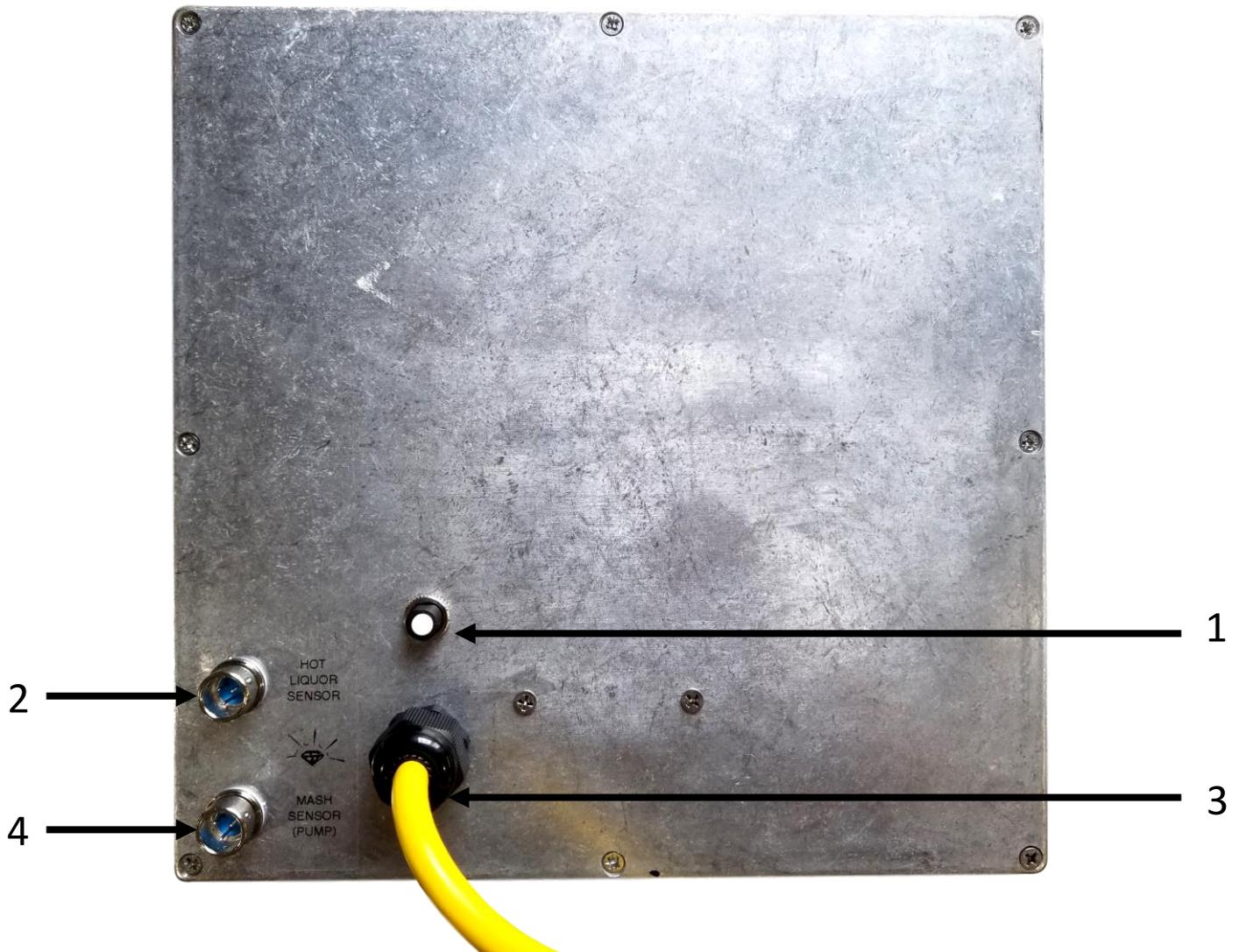
Ignition Control Box

# Digital Control Panel Overview Front Side



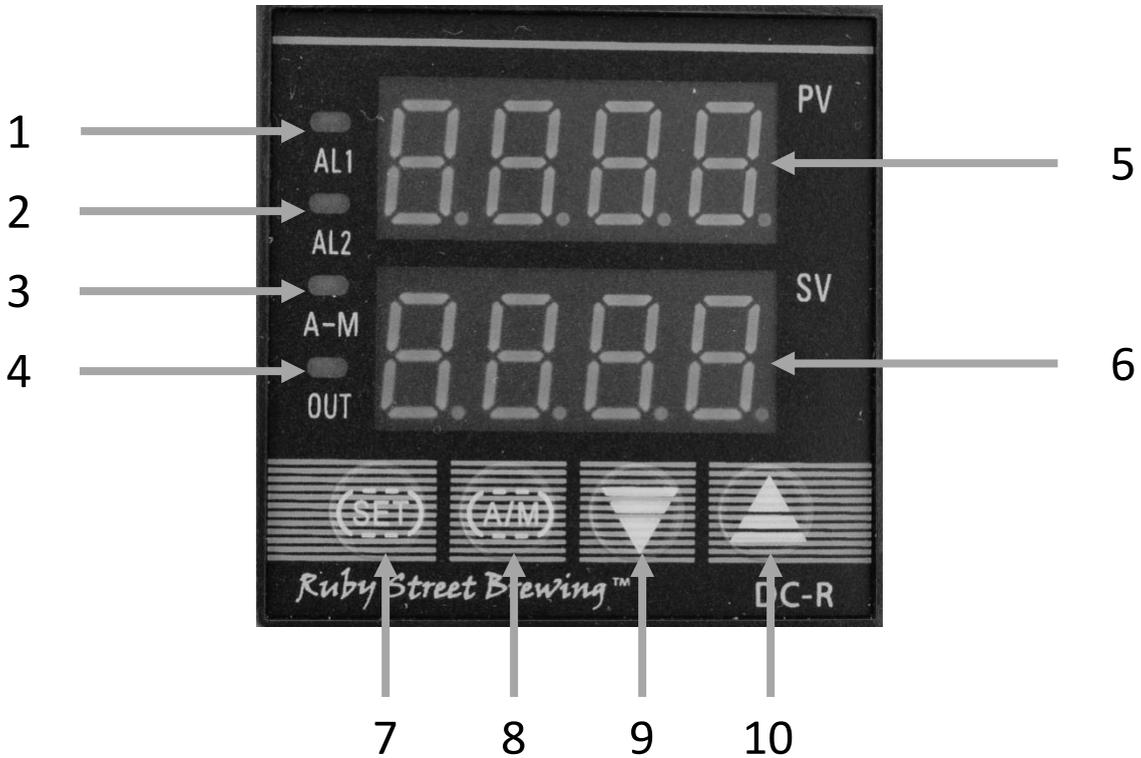
- 1 – Alarm
- 2 – Emergency Stop Button
- 3 – HLT Digital Temperature Controller
- 4 – MASH Digital Temperature Controller
- 5 – Hot liquor tank ignition control switch
  - AUTO – Cycles burner to control temp based on sensor input and set temperature
  - OFF – HLT burner off
  - ON – Ignites HLT burner (manual override)
- 6 - Boiler burner control switch
  - ON – Ignites boil burner
  - OFF – Boil burner OFF
- 7 – Mash Tun ignition control switch
  - AUTO – Cycles burner to control temp based on sensor input and set temperature
  - OFF – Mash burner off
  - ON – Ignites Mash burner (manual override)
- 8 – Heat On Indicator Lights for HLT, MASH, BOIL
- 9 – Alarm Switch
- 10 – Wort Pump Switch
- 11 – Process Timer
- 12 – Water Pump Switch

# Digital Control Panel Overview Back Side



- 1 – 5 Amp Circuit Breaker – Push to Reset
- 2 – HLT Sensor Input
- 3 – Yellow Digital Controller Connection Cable
- 4 – MASH Sensor Input

# Digital Temperature Controller Overview



1 – Alarm 1 Indicator – Temperature alarm triggered when lit (if the alarm switch is in the ON position, alarm will sound when lit)

2 – Alarm 2 Indicator (not used)

3 – Manual Mode Indicator (not used)

4 – Output Indicator – When indicator light is on, control cycle is calling for heat (if the control panel switch is in AUTO position, burner will ignite when lit)

5 – Process Value – Indicates temperature measured by sensor probe (sensor input)

6 – Set Value – Indicates temperature set value (user input)

7 – SET Key - When pressed momentarily, the controller will switch the lower (SV) display between set value and percentage of output (0 or 100). When pressed and held for two seconds will put the controller into parameter setting mode.

8 – Data shift key – When setting temperature value, this key will move the decimal point allowing faster adjustments

9 – Decrement key ▼ : Decreases numeric value of the temperature setting

10 - Increment key ▲ : Increases numeric value of the temperature setting

# Assembly

Figure 1



Figure 2



Figure 3

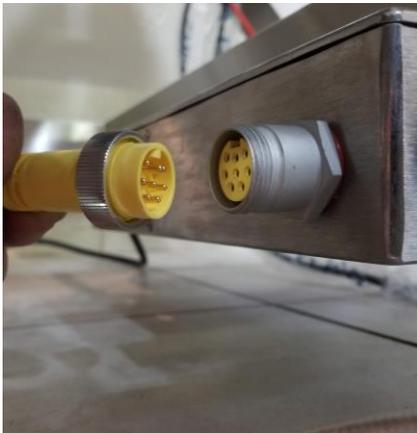


Figure 4



Step 1: Attach the digital control panel bracket to the left front upright of the brewery frame using the two included snap pins as shown (Figure 1)

Step 2: Attach the control panel to the mounting plate on the bracket using (4) included 1/4" x 3/4" stainless steel bolts and washers. Do not overtighten bolts

Step 3: Attach the yellow digital controller connection cable to the ignition control box (under the frame) as shown (Figure 3). The cable has an indexing tab on the inside that must align with a notch on the socket. While pushing the connector into the socket, gently thread the outer sleeve onto the threaded portion of the socket. Make sure that the cable is routed away from all heat sources and outside of the frame as shown (figure 4)

# Assembly (cont.)

Figure 4



Figure 5



Figure 6



Step 4: Attach the short sensor cable to the hot liquor tank temp sensor (located below ball valve) (Figure 4). Align the indexing tabs on the cable and the sensor and push the connector onto the sensor. Note: to remove sensor cable, pull back on outer metal sleeve (never twist the sensor cable connectors)

Step 5: Attach the longer sensor cable to the mash temp sensor (located on mash pump inlet) (Figure 5) using same process as Step 4)

Step 6: Attach both sensor cables to their respective sensor input ports on the backside of the control panel (Figure 6)

Step 7: From the back side of the brewery, plug the water pump into the right side pump connection on the Ignition Control Box and plug the wort pump into the left side connection. (Figure 7)

Figure 7



# Ignition Process

Our digital control systems feature a safe and advanced electronic ignition system. The ignition system controls the gas valves, safely lights the burners and continuously monitors the flames – responding instantly to a loss of flame.

## **Start Up:**

- When the set value temperature is set above the process value temperature (in AUTO position) or the control switch is in the ON position:
  - The ignition control circuitry for that specific burner will power up and perform a self-check routine.
  - Within seconds the gas solenoid valve is energized and sparks commence for 4 seconds or until flame is detected.
  - When flame is detected, the spark is shut off and the gas solenoid valve remains energized.
  - The temperature and burner flame are constantly monitored to ensure that the system is functioning properly.
  - When the process value temp meets or exceeds the set value temperature (in AUTO mode) and the demand for heat ends, the gas valve is de-energized immediately and the flame is extinguished.

## **Flame Failure During Ignition Period:**

- Should the burner fail to light or flame is not detected during the first 4 second ignition period, the gas valve is de-energized for 15 seconds to allow unburned gasses to dissipate before another ignition attempt.
  - After the 15 second inter-purge, the control will attempt two additional ignition trials, each with a 15 second inter-purge. If all 3 attempts to ignite the burner are unsuccessful, the control will go into lockout mode.
  - If the control goes into lockout mode, it must be reset by moving the control switch for that burner back into the OFF position for a period of 5 seconds.

## **RE-IGNITION:**

- If the established flame signal is lost while the burner is operating, the control responds and begins sparking within 0.8 seconds. The spark will be energized for a 4 second period in an attempt to re-light the burner. If flame is re-established, normal operation resumes.
  - If the burner does not light after the first attempt, the control will again attempt 2 more times (with 15 second inter-purge) to re-light the burner. If the burner fails to light after the third try, the control will de-energize the gas valve and go into lockout mode.

# Testing the System

## Important Notes:



1. Prior to using any of the control equipment, please read the complete owners manual that was provided with your brewery or frame
2. Always make sure that all control panel switches and gas valves are in the OFF position prior to plugging in the digital control system
3. This system is designed to ignite the burners based on temperature sensor feedback. When any burner is in AUTO mode, that burner will cycle on and off without warning. Never place anything other than brewing kettles on the frame. Keep Children and pets away from the brewing area while operating
4. Never leave system unattended during operation
5. Never heat an empty kettle

**Testing the ignition system** - Prior to brewing, it is always a good idea to test the ignition system without kettles on the frame to ensure that all gas valves and electrodes are functioning properly.

- Disconnect the sensor cable from the HLT (the system can be powered up without sensor cables connected)
- Remove all kettles from the frame, make sure that nothing is on the frame, and confirm all cables are away from the burners.
- Turn off all gas valves and position all control panel switches in the OFF position.
- Plug in the control system using the power cord on the backside of the ignition control box
  - Both temperature controllers should power up and show a display at this time
- One at a time, switch each burner control switch to the ON position and confirm the following:
  - After about 1 second, there should be a loud click sound from the solenoid valve, and sparking should occur between the electrode tip and the cast iron burner.
- Once the click and spark are confirmed, move the switch back to the OFF position, and test remaining burners in the same manner.
  - If any one of the systems failed the above test, refer to the troubleshooting guide in this manual.
- Next connect and open your propane cylinder (or natural gas source)
- Open the (3) burner control valves located on the frame.
- Again test each burner one at a time by moving the control panel switches to the ON position
- The burner flame should ignite and stay lit as long as the switch is ON
- If any one of the burners fails to ignite at this time, switch the control panel switches to the OFF position.
  - If ignition fails, refer to the troubleshooting guide in this manual. You may need to adjust the electrode position or the air control for that burner.

# Operating Instructions

The HLT and Mash burners can be operated either as manual ON/OFF control or as automatic temperature control using the switches on the control panel. The Boil burner only features a manual ON/OFF control switch on the panel.

## **Note about Sensors:**

- The temperature sensor probe for the HLT is located in the HLT (below the ball valve). The sensor is very fragile and extreme care must be taken to not damage the sensor when stirring the kettle or installing or removing the dip tube. It has been located underneath the dip tube for protection.
- The temperature sensor for the Mash Tun is located on the inlet side of the mash pump. In order to automatically maintain temperature in the Mash Tun you must be recirculating the volume with the pump. This system is typically referred to as RIMS (Recirculating Infusion Mash System). With this system you can measure and heat the strike water for your mash directly in the mash tun, and then recirculate during the mash to maintain mash temperature.
- Both temperature sensors have been calibrated prior to shipping your equipment. You can use the digital temperatures to calibrate the dial thermometers on your kettles (if applicable)

## **Note about Digital Controllers:**

- The advanced digital controllers that we have included with your equipment (often referred to as PID's) have been programmed by Ruby Street Brewing, LLC to maintain temperature accuracy to within 0.5°F.
- The controller settings are designed to maintain accurate temperature control while also maximizing the life of the electronic solenoid valves and other electronic components. The current settings feature a 1 second cycle time (minimum 1 second burner on, minimum 1 second burner off). Changing the factory programmed settings on the controllers may cause damage to solenoid valves or other electronic equipment due to over-cycling.

## **Adjusting the Controller Temp:**

- Adjusting the set value temperature on the controllers is very simple and is very similar to adjusting your home thermostat.
- To change the set value on the controller:
  - Start with the control panel switch in the OFF position
  - Press the ▼ or ▲ key once, and then release it. The decimal point on the lower right corner will start to flash. Press the ▼ or ▲ key to change SV until the desired value is displayed. If the change of SV is large, press the A/M key to move the flashing decimal point to the desired digit that needs to be changed. Then press the ▼ or ▲ key to start changing SV from that digit. The decimal point will stop flashing after no key is pressed for 3 seconds. The changed SV will be automatically registered without pressing the SET key.
  - Now move the corresponding control panel switch into the AUTO position.
  - The burner will ignite and continue to heat until the process value meets or exceeds the set value. Once the process value falls below the set value, the burner will automatically reignite. The system will continue to perform in this manner in order to maintain your programmed temperatures.

# Operating the Digital Timer



- 1 – Time Remaining while timer is in operation (hours, minutes, seconds format HH.MM.SS)
- 2 – Set Time (hours, minutes, seconds format HH.MM.SS). Image shows timer set for 10 seconds
- 3 – Set Button – Used to access timer parameters
- 4 – Data shift key – When setting time values, this key will move the adjustment character allowing for faster adjustment
- 5 – Decrement key ▼: Decreases numeric value
- 6 – Increment key ▲: Increases numeric value

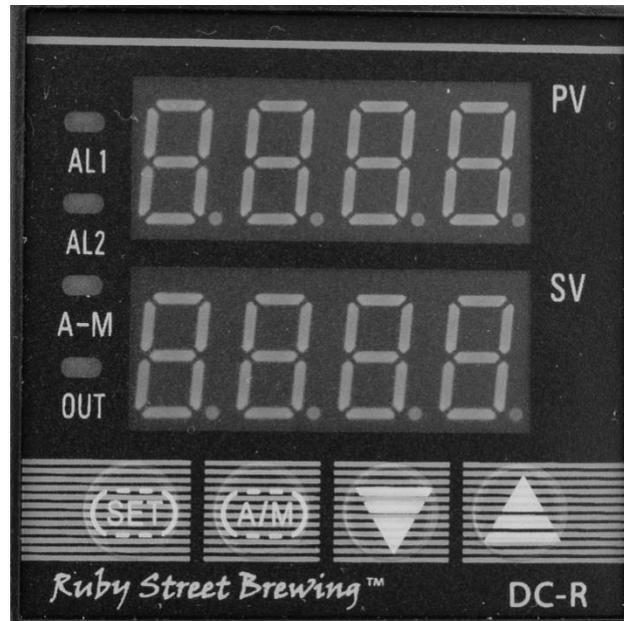
## To Set Timer:

- Press the 'SET' key 1 time (timer should display 'T1'
  - Adjust the timer value in hours, minutes, or seconds
- Press the 'SET' key 1 time (timer should display 'T2'
  - Adjust the alarm duration in seconds (default is 5 seconds) This is how long the alarm will continue to operate after the elapsed time has expired.
- Press and hold the 'SET' key until the unit returns to the home screen (all zero's in top display similar to image above) (approximately 4 seconds)
- Your timer set value should now appear in lower display (example above shows 10 seconds)

## To Run Timer:

- Switch the rotary 'ALARM' switch on the control panel to the 'ON' position
- Long Press the 'RUN' key on the digital timer to begin timer count-down process
- When time has expired the alarm will sound for the time duration programmed into T2

# Setting Temperature Alarms



You can program temperature alarms into either one of your digital control units to alert you via the control panel alarm system when temperatures have reached certain values. These units are shipped with default programming for high temperature alarms only. It is possible to program the units to trigger alarms based on specific temperature ranges or low temperature alarms as well. Contact Ruby Street Brewing, LLC for more information if you wish to utilize additional features of the alarm system.

Example of high temperature alarm use:

- Set alarm to notify you when your HLT or Strike Water has hit temperature. In this case you would program the alarm to exactly the same temp setting as your controller setpoint. When the liquid in the kettle reached the set temperature, the alarm will sound.

To Set Alarm(s):

- Press and Hold the 'SET' key until the unit displays 'ALM 1' in the upper display
- Adjust the Alarm temperature value using the up and down arrow keys on the unit (you can use the 'A/M' key to move the adjustment character)
- Press the 'SET' key (2) additional times to return the controller to the home screen
- Your alarm is now set and will trigger when the process value reaches or exceeds the alarm temperature value.
- Switch the rotary 'ALARM' switch on the control panel to the 'ON' position

To Cancel Alarms:

- Simply set the Alarm temperature value to any value above boiling temperatures (default setting is 250 F)
- Please note that alarms will trigger when sensor cables are not connected. Simply use the rotary ALARM switch on the control panel to silence alarms in this situation.

# Troubleshooting Guide

If any component of the digital control system is not functioning properly, please use the tips below to troubleshoot the problem. For any problems that cannot be resolved using the troubleshooting guide, please contact Ruby Street Brewing, LLC for support

## **No Display on digital controllers**

- Make sure unit is plugged in and check the building circuit
- Confirm controller cable is properly connected to ignition box
- Reset circuit breaker on backside of controller

## **One or more digital controllers displays 'orAL'**

- Confirm that sensor cables are properly connected at both ends
- Could indicate faulty sensor or sensor cable. Switch cable and sensor connections using different combinations of cables and probes to isolate the problem. Contact Ruby Street Brewing, LLC for replacement parts.

## **Digital controller displays 'A 0' or 'A 100'**

- The controller has been switched to % output control mode. Press and release the 'SET' key 1 time to return the controller to temperature display mode.

## **Digital controller display becomes erratic or resets during ignition.**

- This is caused by electromagnetic interference from the ignition circuits. Turn all gas valves off and turn ignition control switches to 'ON' one at a time to isolate which ignition circuit is causing interference. Once determined, move all switches to 'OFF' positions and check the following:
  - Check and adjust spark electrode gap (should be 1/8" – 3/16" from burner). Too little or too much gap can cause interference.
  - Check spark electrodes for cracks or damage
  - Check ignition cables for damage. Make sure that spark is only occurring between electrode tip and burner
  - Isolate sensor cables away from other electrical connections. Especially red ignition cables.

## **Electrode sparks but no ignition (gas is not flowing from burner)**

- Ensure that gas valves are open at the following locations
  - Propane cylinder or natural gas shutoff
  - Propane regulator needle valve (opens counter-clockwise)
  - Burner control valves at manifold
- The gas solenoid valves make a loud distinctive click sound when they electrically open that coincides with spark ignition at the burner. If the ignition spark occurs without the sound of the valve opening it could indicate faulty solenoid valve coil or faulty ignition control board.

## **Electrode sparks but no ignition (gas is flowing from burner)**

- Adjust air control disc on burner to minimum air setting (too much air will prevent ignition from occurring). Once ignition takes place, re-adjust air control for ideal blue flame.
- Make sure that the ignition electrode tip is directly above one of the burner orifices and that spark gap is set to 1/8".

# Troubleshooting Guide

## (Continued)

### **Up and Down keys on Controller are not functioning**

- Press and Hold the 'SET' Key until controller displays 'Alarm 1'
- Press and release 'SET' key once more to move parameter setting from 'Alarm 1' to 'Lock'
- Change the Lock code to "0" using the up and down keys
- Don't press any additional keys until controller has returned to normal mode (about 15 seconds)

### **Burner ignites when activated, spark sequence continues during flame, and flame fails within 4 seconds.**

- This is caused when the flame sensing circuitry fails to detect flame after the burner has ignited. As a safety feature the system is designed to close the gas valve if the system fails to detect flame for any reason. Please test all 3 burners and follow these steps to diagnose
  - **ALL 3 BURNERS FAIL TO SENSE FLAME:**
    - This almost always indicates a problem with the power source to the brewery, most commonly a reverse polarity AC circuit or open ground condition. If you are using an extension cord, try a different cord, and different outlet. Have your buildings electrical circuit inspected for possible reverse polarity condition (note that almost all common appliances will operate correctly on reverse polarity AC). Contact us for support
  - **1 OR 2 BURNERS FAIL TO SENSE FLAME OR INTERMITTENT FLAME SENSE ISSUES:**
    - Adjust the electrode gap to 1/8" – 3/16" from burner face. The electrode must be directly above one of the burner orifices to operate. Make sure that the orifice is not plugged or obstructed
    - Reduce air to the burner using the round air control disk located where the gas line connects to the burner. There must be visible blue flame at the tip of the electrode for the flame sensing system to properly operate. Too much air will cause the flame to burn above the electrode tip, too little air will result in heavy yellow-orange flame and produce soot.
    - Confirm that all ignition (red) wire connections are clean and dry, and that the white porcelain portion of the electrode is clean and dry.
    - Possibility of moisture in ignition control box. Contact Ruby Street Brewing, LLC for specific instructions on how to dry and properly reseal the box.

# Cleaning and Adjustment

**Please Note: It is very important that the control system is unplugged, and that all gas valves are in the off position before making any adjustments or cleaning your digital control system.**

## **Adjusting the electrode spark gap:**

- In order to properly function, the electrode tip must be maintained at a 1/8" gap from the tip of one of the burner face orifices.
- For fast ignition, the electrode tip must also be centered directly above one of the raised burner orifices.
- Adjust the electrode wire using two pairs of pliers. Use one pair of pliers to hold the electrode wire near the white porcelain insulator. Use the other pair of plier to gently bend the electrode wire to the desired location. Be extremely careful not to stress and crack the porcelain insulator.
- If the electrode becomes cracked or damaged, contact your dealer for replacement

## **Cleaning the digital control panel:**

- Please note that the digital control panel is NOT water resistant. Always make sure that your hands are dry and clean when operating the control panel.
- Avoid spills or drips on the digital control panel. If spills or drips occur, unplug the control system and clean up spill with a clean towel immediately.
- The panel itself can be cleaned using a slightly dampened cloth to remove dirt

## **Cleaning the ignition control box:**

- The ignition control box is a sealed unit and is water/splash resistant and should not be damaged by drips or boil-over that can occur during brewing
- The ignition control box should never be submersed or sprayed off
- Clean using a damp cloth to remove dirt or wort spills.
- Always dry the box and ignition wire terminals after cleaning.

# Limited Warranty

Ruby Street Brewing, LLC warrants this product to be free from defects in workmanship and material, under normal use and service conditions for one year from the date of purchase. This warranty extends only to the original purchaser. Ruby Street Brewing, LLC's obligation under this warranty is limited to replacing or repairing at Ruby Street Brewing, LLC's option. All repairs for which warranty claims are made must be pre-authorized by Ruby Street Brewing, LLC. This warranty does not extend to any product or damage to a product caused by or attributable to freight damage, abuse, misuse, improper or abnormal usage, or repairs not provided by Ruby Street Brewing, LLC authorized service personnel. Specifically excluded are damages caused by or attributable to the following incidents: Any damage to the components attributable to improper handling or freight damage; damage resulting from improper storage; or damage resulting from failure to properly follow owners manual operating and maintenance instructions. Excluded are components that are subject to replacement due to normal wear including but not restricted to sensor probes, sensor cables, electrodes, ignition wires. The warranty also excludes any deterioration, burning, or discoloration of the control system components. No other warranty beyond that specifically set forth above is authorized by Ruby Street Brewing, LLC.

Ruby Street Brewing, LLC is not responsible or liable for indirect, special or consequential damages arising out of or in connection with the use or performance of the product or damages with respect to any economic loss, loss of or damage to property including water damage, fire damage, loss of revenues or profits, loss of use, or other consequential damages of any nature. Some states do not allow the exclusion or limitation of incidental or consequential damages. Accordingly, the above limitation may not apply to you.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

Ruby Street Brewing, LLC, Fort Collins, CO