Ruby Pro 4 Vessel Owner's Manual

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Introduction

Thank You for purchasing The Ruby Pro™

Our machines are hand built and shipped mostly assembled using high quality components and materials. All additional assembly can be accomplished by hand tightening with no tools required. 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
Nunn, CO

Email:
Questions@RubyStreetBrewing.com
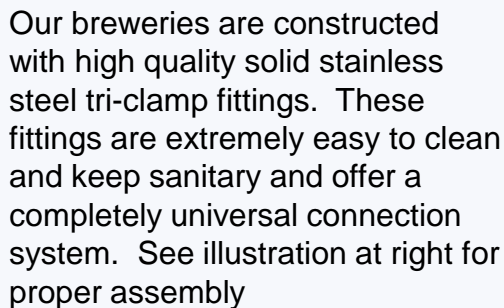
SAVE THESE INSTRUCTIONS

Safety Instructions

WARNING: To Reduce the risk of serious injury, read the following important precautions before using the Ruby Pro 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.
• Not For Indoor Residential Use! This equipment must only be operated outdoors in adequately ventilated areas or in properly vented indoor commercial applications.
• The brewing structure must only be used on a level hard surface such as concrete. Do not use on a flammable surface or surface that could be damaged by moisture.
• Make sure that all caster wheels contact the ground evenly, and that the frames cannot rock or sway during use. Adjust casters as needed to correct for uneven surfaces. Lock all casters prior to use.
• Do not use under covered areas such as patio covers, porches, canopies, or under decks.
• Make sure that there are no flammable materials or substances near the brewery during operation.
• Inspect and tighten all parts 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 control system is plugged into a GFCI protected circuit. If in doubt consult a licensed electrician before using.
• Do not touch the frame or place anything on the frame during operation, the frame areas around the kettles may become extremely hot.
• Do not leave brewery unattended at any time during operation.
• Do not attempt to move the brewery unless all liquid is removed from the kettles and the gas hoses and/or regulators are disconnected from the fuel source.
• Do not use in windy areas, as this will cause the burners to perform incorrectly and could cause damage to the frame.
• Never store a propane cylinder on the brewery frame.
• Never store a propane cylinder inside of a building or other enclosed area.
• Never heat an empty kettle! This will cause damage to the kettle and other components.

Brewery Overview

Familiarize yourself with all system components prior to assembly

Boil Kettle
Mash Tun
Mash Tun
Boil Kettle
Digital Control Panel
Vorlauf & Sparge Inlet
Vorlauf & Sparge Inlet
Whirlpool Inlet
Boil Temp Sensor (x2)
Whirlpool Inlet
Caster Wheels
Kettle Bottom Drains (x4)
Water Pump
Cast Iron Burners (x4)
Burner Control Gas Valves
Grain Out Manway (x2)
Wort Pump
Plate Chiller
Stainless Frame

Our breweries are constructed with high quality solid stainless steel tri-clamp fittings. These fittings are extremely easy to clean and keep sanitary and offer a completely universal connection system. See illustration at right for proper assembly

Ferrule

Clamp

Gasket

Ferrule

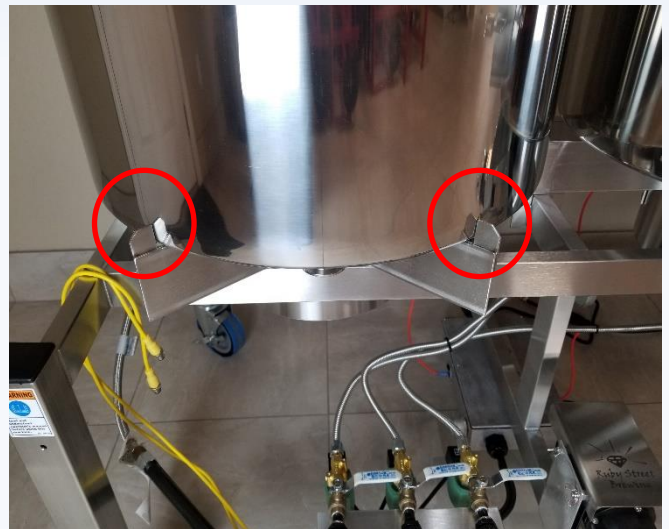# Brewery Assembly

Kettle Placement and Assembly

Step 1:

Place the frames 10"-12" apart and lock all caster wheels. Gently place all 4 kettles on the frames in their proper positions. The (2) mash tuns (with manways) go in the center positions. The (2) boil kettles with the whirlpool inlets go in outside positions.

Step 2:

Pull each kettle forward until it contacts both kettle stops. The bottom drain port should be centered between the stops.

Step 3:

Make sure that each of the sensor probe ports are centered above the heat shields (boil kettles). These heat shields prevent flame and heat from damaging the sensor probes and cables. Check before each use.

Brewery Assembly

Kettle Placement and Assembly

Step 4:

Locate and identify all manway door components: stainless door, silicone door gasket, lock assembly, hinge pins
(note that some components may be pre-assembled)

Step 5:

Install manway door and lock assembly onto one of the mash tun door frames as shown by inserting the hinge pins from the top in both sides. Place the silicone gasket inside the door. Align the door on the door frame making sure that the gasket extends evenly around all sides of door frame. Gently tighten the lock assembly to secure the manway door. The manway door should only be tightened enough to prevent leaks. Overtightening can permanently damage the door and or frame. Repeat process for 2nd mash tun.

Brewery Assembly

Kettle Placement and Assembly

Step 6:

Install the false bottom assembly into the bottom of one of the mash tuns as shown. The false bottom handle should be towards the back of the kettle and the bottom drain hole should be centered between the (2) welded false bottom supports. Repeat for the 2nd mash tun. There are (2) dome false bottoms for the boil kettles that should be installed with the tab extended into to the bottom drain hole of each kettle.

Step 7:

Using clamps and gaskets install the 45 degree tri clamp elbows and butterfly valves onto all (4) kettles. Make sure that you orient each valve so that the handle swings downward when opening. Squeeze the metal lever beneath the handle to rotate each valve open to check for proper operation and clearances.

Step 8:

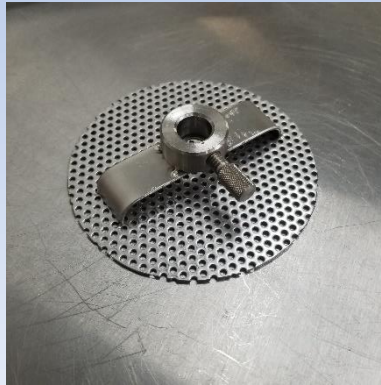Install the (2) temperature probes into the sensor ports on the boil kettles using clamps and gaskets.

Brewery Assembly

Kettle Placement and Assembly

Step 9:

Locate and identify vorlauf and sparge assembly components: tri clamp sparging tube, sprinkling disc.

Step 10:

Install the tri clamp sparging tube into one of the mash tun upper ports as shown with a clamp and gasket.

Step 11:

Place the sprinkler disc onto the sparging tube and secure by tightening thumb screw. Make sure that the sprinkler disk is level by rotating the sparge tube at the tri clamp fitting prior to tightening the clamp. Repeat for 2nd mash tun. We recommend removing the vorlauf and sparge assembly when mashing in and cleaning to avoid damage and allow better access to the mash tun when stirring.

Brewery Assembly

Kettle Placement and Assembly

Step 12:

Install the whirlpool arm into one of the boil kettles. Align it facing left or right and secure with a clamp and gasket. Repeat for 2nd boil kettle
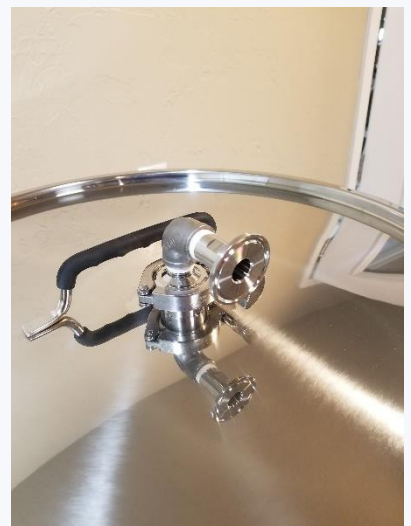

Step 13:

Install a butterfly valve onto each of the whirlpool arms with a clamp and gasket. Make sure that you orient the valves so that the handles swing outward when opening. Squeeze the metal lever beneath the handle to open each valve and check for proper operation.

Step 14:

One of the (4) kettle lids is designed as a CIP (clean-in-place) lid with a welded tri clamp port. Insert the included spray-ball assembly into the CIP lid, align the tri clamp connection directly away from the lid handle and secure with a clamp and gasket.

Brewery Assembly

Pump and Chiller Assembly

Step 15:

Place all (3) pumps onto the pump brackets and secure with wing nuts as shown.

Step 16:

On the back side of the ignition control box (located beneath the frame) there are (2) outlets to power the pumps located on the 3 vessel frame. Plug each pump into the correct outlet as shown. Left side pump and right side pump are marked on the ignition control box. Note that you can wrap the pump cords around the lower frame rail prior to plugging them in to avoid the cords dragging on the floor. The water pump located on the single vessel frame will plug into the pigtail on the back of the control panel once the panel installed.

Step 17:

Place the plate chiller onto the plate chiller bracket and secure with wing nuts from the backside as shown. The plate chiller should be installed with the (2) water fittings upward as shown.

Brewery Assembly

Pump and Chiller Assembly

Step 18:

On the 3 vessel frame, connect the boil sensor cable that is routed through the frame to the boil kettle sensor probe. On the single vessel frame connect the 3' sensor cable (marked boil) to the boil kettle sensor probe. Make sure that each cable is routed outside of the frame and away from risk of damage by heat.

Step 19:

Install a sensor tee onto the left side (wort pump) inlet with the sensor probe facing towards the inside of the brewery frame as shown. Attach the 6' sensor cable (marked mash) to the sensor probe. Orient the probe so that the cable is routed downward and does not obstruct operation or the gas valve.

Step 20:

Install a sensor tee onto the right side (wort pump) inlet with the sensor probe facing towards the inside of the brewery frame as shown. Attach the mash sensor cable that is routed through the frame to the sensor tee.

Digital Control 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.
• HIGH VOLTAGE INSIDE – Never open control system enclosures without first disconnecting power.

Controller Assembly

Familiarize yourself with all system components prior to assembly

Control Panel
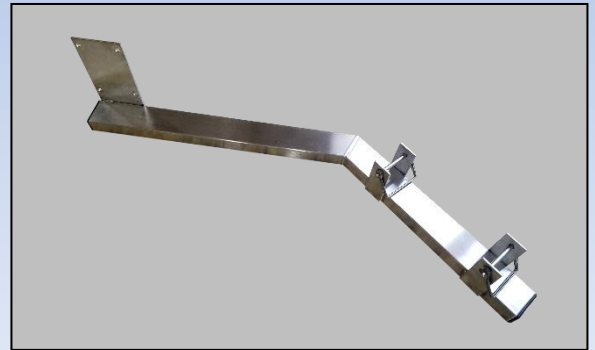
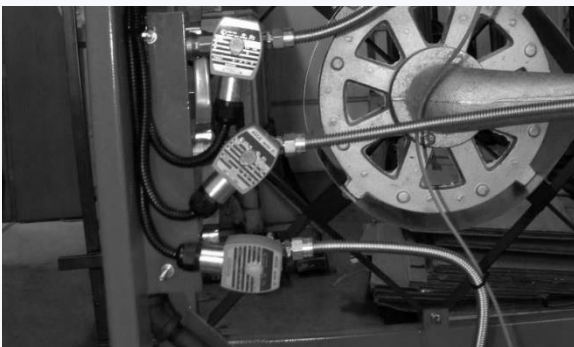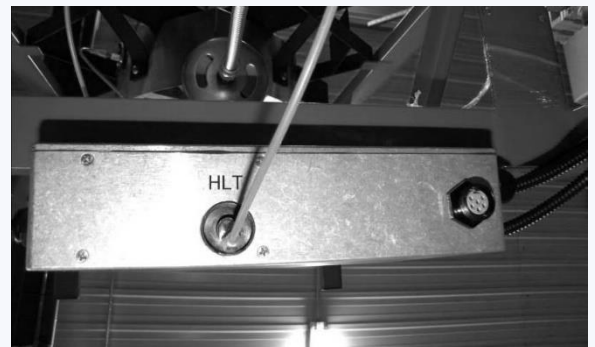Control Panel Bracket

Sensor Probes (2) Boil

Sensor Tee (pump)

Sensor Cables (4) (1m, 2m, 2m, 3m)

Electrodes (4)

Solenoid Valves (4)

Ignition Control Box

Controller Assembly

Digital Control System Assembly

Step 1:

Install the digital control mounting bracket onto the front left side frame upright and secure by inserting included stainless lynch pins through the holes in the frame upright.

Controller Assembly

Digital Control System Assembly

Step 2:

Install the digital control panel onto the bracket using (4) stainless steel bolts and washers. Gently tighten bolts with a 7/16" wrench or socket.


Step 3:

Attach the yellow digital controller connection cable to the ignition control box (under the frame) as shown. 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

Step 4:

Connect each of the (4) sensor cables to the backside of the digital control panel. Each cable is marked for proper connection and the sequence (left to right) should correspond with the placement of the sensor probes. Connect the yellow communication cable from the single vessel frame to the large port on the back side of the control panel.
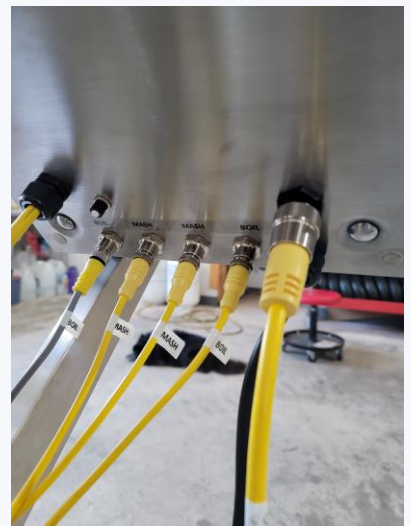
Location and Utilities

Brewery Location:
- Locate the Ruby Pro on a flat and level surface that is non-flammable and cannot be damaged by moisture. Adjust casters if necessary to make sure that the brewery frame is level and cannot rock or sway. Make sure that there is not any type of material or structure above the brewery (porches, overhangs, canopies, etc.). Also confirm that the brewery is a safe distance away from any construction. This is a good time to confirm that your location also has good access to water and GFCI protected electricity.

Fuel Connection:
- Propane - Place a propane cylinder at the end of the brewery near the supply hose and regulator. Make sure that the cylinder is a minimum of 24" from any part of the frame. Confirm that all gas control valves are completely closed prior to connecting the propane regulator to the supply cylinder (including the needle valve located on the propane regulator). Thread the propane regulator plastic nut onto the propane cylinder and tighten connection firmly by hand.

- Natural Gas – Your building supply must have a safety shutoff valve at the connection point. Make sure that the natural gas hose is routed along the floor and away from any heat sources. Do not coil any excess supply hose on or near the brewery frame where it could be exposed to direct and/or reflected heat from the burners.

- After the fuel source is connected ALWAYS CHECK FOR GAS LEAKS prior to lighting burners. Open the propane cylinder valve or natural gas valve allowing gas to flow into the brewing system manifold. Using a small brush or spray bottle, apply soapy water around all gas connections. Watch closely for any bubbles that appear indicating a gas leak. If you detect a gas leak, turn off the fuel source. DO NOT proceed with using this equipment if the gas leak cannot be stopped.

Electrical Connection:
- This brewing system requires one properly grounded GFCI protected 115v AC outlet to operate the control system and pumps. Total amp draw for the entire system is <5 amps. Test outlet prior to use for proper ground, polarity and GFCI function. The system can be operated on a suitable extension cord as needed. Make sure that all connections are protected from moisture.

Digital Control Panel Overview
Front Side

1 – Emergency Stop Button (main power switch)
2 – Alarm
3 – Alarm Switch
4 – Digital Temperature Controllers (Boil / Mash / Mash / Boil)
5 – Ignition Control Switches
      AUTO – Cycles burner to control temp based on sensor input and set temperature
      OFF – Burner off
      ON – Ignites burner (manual override)
6 – Heat On Indicator Lights
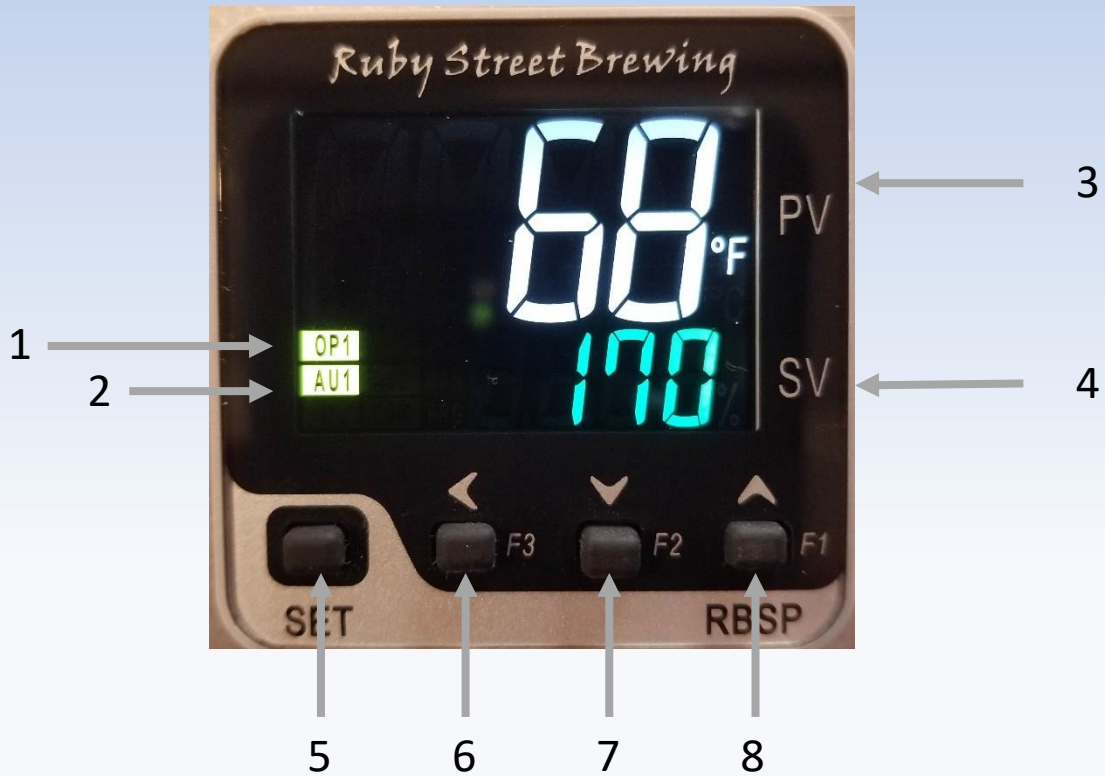7 – Pump Switches
8 – Process Timer
9 – Enclosure Door Lock

Digital Control Panel Overview
Back Side
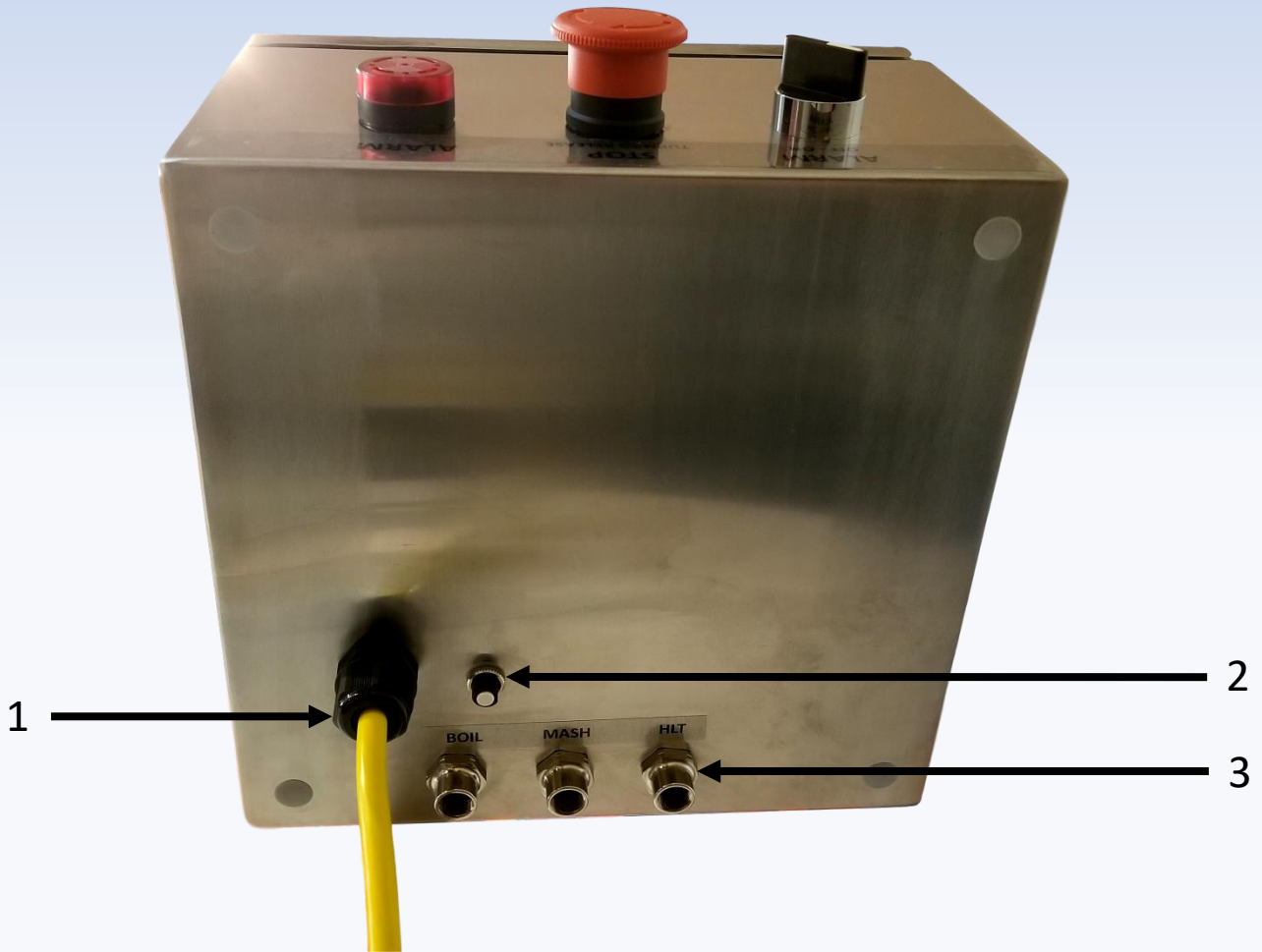
1 – Digital Controller Connection Cable
2 – 5 Amp Circuit Breaker (push to reset)
3 – Sensor Input Connections

Temp Controller Overview

1 – 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)

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

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

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

5 – SET Key – Used to enter adjusted values and access parameters menu

6 – Data shift key – When setting temperature values, this key will shift the adjustment position to the tens and hundreds allowing for faster temperature adjustments

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

8 – Increment key ▲: Increases numeric value of the temperature setting

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 mode) or the control system is in the ON mode:
  – 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. Always make sure that all gas valves are in the OFF position prior to plugging in the digital control system
> 2. 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
> 3. Never leave system unattended during operation
> 4. 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 cables from the Boil kettles (the system can be powered up without sensor cables connected)
- Remove bottom drain elbows and valves from all kettles and 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
    - All 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 cylinders (or natural gas source)
- Open the (4) 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.

Sensors and Controls

The burners can be operated either as manual ON/OFF control or as automatic temperature control using the switches on the control panel.

Note about Sensors:
- The temperature sensor probes for the boil kettles are located in the boil kettles. The sensors are very fragile and extreme care must be taken to not damage the sensors when stirring the kettle.
- The temperature sensors for the mash tuns are located on the inlet side of the mash pumps. In order to automatically maintain temperature in each 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.
- All temperature sensors have been calibrated prior to shipping your equipment.

Note about the Digital Control System:
- The advanced control system that we have included with your equipment has been programmed by Ruby Street Brewing, LLC to maintain temperature accuracy to within 1 °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.

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 to change SV until the desired value is displayed. If the change of SV is large, press the ◄ key to move to the desired digit that needs to be changed. Then press the ▼ or ▲ key to start changing SV from that digit. The changed SV will be automatically registered in approx 4 seconds 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.

Pumps

DO NOT RUN DRY:
Any pump that you are using must be properly primed with the pump head completely flooded with liquid prior to starting the pump. The pump impeller bearings rely on liquid for lubrication. Running a pump dry for even a few seconds may damage the pump impeller resulting in need for replacement.

How to Prime Your Pumps:
Connect the appropriate hose from the kettle you wish to pump from to the inlet side of the pump (the connection opposite the pump flow control valve). Connect an outflow hose to the outflow (valve) side of the pump. With the power off, hold the open end of the outflow hose above the level of the Tanks, open the ball valve on the pump completely followed by opening the ball valve on the kettle completely. This should allow the pump head to flood with liquid and at this point you should see liquid flow through the pump and into the beginning of the outflow hose. Do not start the pump. Once you have confirmed that the pump head is filled with liquid, close the outflow valve on the pump. Connect the pump outflow hose to the proper connection or simply place the hose into the bottom of the kettle you want to pump into. Start the appropriate pump from the control panel. Slowly open the pump control valve to the desired flow rate. If liquid is not flowing from the outflow hose, the pump did not prime. Stop the pump, and repeat the process above. With practice, you will find that priming centrifugal force pumps can be fairly simple. Keep in mind that any air trapped in the pump head will cause difficulty when priming.

Cleaning Your Pumps:
Pumps that have been used for anything other than clean water must be immediately cleaned and flushed after brewing. Make sure that you circulate PBW or similar brewery cleaner through the pump to flush out any residual sugars or solids. Backflush the pumps with clean water to remove all cleaning solutions from the pumps. If you're not going to re-use the system within a day, remove all water from the pumps by loosening the pump from the mounting bracket, remove the valve from the pump and gently shake out any excess water from the pump head. Store the pump ball valves half-way open to allow the entire valve to drain and completely dry.

Pump Maintenance:
It may be necessary to occasionally disassemble your pumps for a thorough cleaning, or if the pump impeller gets stuck. This can be easily accomplished by removing the (4) screws on the front of the pump head, and then removing the (4) screws on the backside of the pump head to remove the impeller cover and access the pump cavity. Oil your pump motors once per year via the oiling port marked on the motor with 4-5 drops of SAE20 non-detergent oil.

Brewing Instructions

Please note that these instructions are only intended to illustrate the basic use of this system and its components. Note that one of the benefits of our system having direct fired mash tuns is the ability to heat strike water directly in the mash tuns and the ability to do more complex step mashes. The direct fired mash tuns also allow the brewer to perform a 170° F mash-out if desired. While the directions below are based on fly-sparging. This 4 vessel system consist of (2) mash tuns and (2) boil kettles that allow for simultaneous brewing. We refer to these as the left pair and right pair. We highly recommend initially only brewing 15-31 gallon batches using the right side pair in order to familiarizes yourself with complete system operation.

Heating Strike Water:
- Add cool clean water (strike water) to the right side mash tun at a rate of 1.25 quarts of water per pound of grain. At this time, add any water treatments as necessary.
- Connect hoses as shown below and begin recirculating the strike water through the vorlauf and sparge assembly (refer to page 24 for instructions on priming the pump).
- Set the strike water temp on the mash tun controller, open the mash tun gas valve and switch the mash tun burner control switch to 'Auto'. There are many online programs and even cell phone apps to help you calculate the correct strike water temperature. Generally strike water temp range is around 165°–169° F

HOSE ARRANGEMENT FOR MASHING

4' Hose   7' Hose

Brewing Instructions

Mashing In:

- Once the strike water is up to temp, turn off the mash tun burner and stop the pump.
- Remove the clamp that attaches the vorlauf and sparge assembly to the mash tun and pull the assembly through the port and allow to hang as shown in the photos below. Doing this allows full access to stir the mash without having to disconnect or reconnect any hoses.
- Add the entire grain bill into the mash tun and stir thoroughly to break up any dry clumps and homogenize temperatures throughout the mash.
- Once the mash is thoroughly mixed, re-connect the vorlauf and sparge assembly, restart the pump and adjust the flow by setting the outflow valve on the pump to about half-way open.
- Set the mash tun digital controller to the correct mash temperature and switch the controller back to 'Auto'
- Allow the mash to recirculate for approx. 60 minutes.
- Keep in mind that while recirculating the mash, the temperature is measured at the wort pump. If the flow stalls for any reason, the control system cannot properly measure the mash temperature. While maintaining the mash temp we advise reducing the flame to the absolute lowest setting possible, and maintaining significant flow through the pump. The key to consistent mash temps is more flow and less flame.
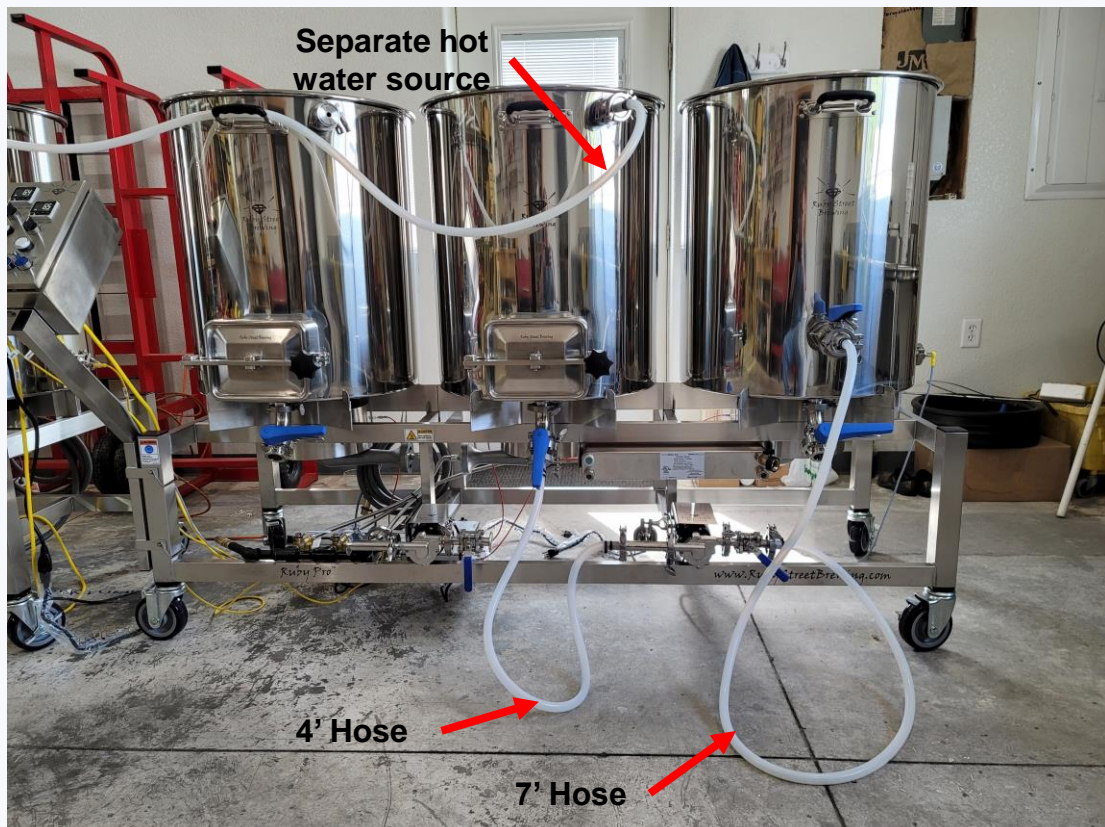
Brewing Instructions

Sparge Water:

- This 4vessel system will require a separate hot liquor tank or on demand source for 170 degree sparge water in order to brew (2) simultaneous batches. If you're only brewing using the right side pair, the left side boil kettle can be used as an HLT if necessary. The pump on the single vessel frame is intended for moving sparge water if necessary, and can be used during the CIP process.

Setting up for Fly Sparge:

- Once the mash is complete you are ready to begin the process of fly sparging.
- Turn the mash burner control switch to 'Off', turn the mash tun gas valve off, stop the pump and close all liquid valves
- Prime the pump and connect the brewing system hoses as shown below to prepare the system for fly sparging.

Note that we prefer to transfer the wort to the boil kettle by placing the hose over the top of the kettle. This allows you to pick up the hose at any time to view and test your flow rates. If you prefer to transfer with the lid on, you can connect the 7' hose to the whirlpool port as shown.

HOSE ARRANGEMENT FOR SPARGING

Brewing Instructions

Sparging:
• Once all hoses are connected you are ready to begin sparging the grain with water from the HLT while simultaneously transferring the wort from the bottom of the mash tun into the boil kettle.
• We recommend that the sparging process take about 90 minutes for optimum efficiency. Start by slowly transferring wort to the boil kettle by adjusting the flow rate with the wort pump outflow valve. Typical pre-boil volumes in the boil kettle should be about 36 gallons for a 1 BBL finished batch. You can use a measuring bucket to capture, measure and time your wort runoff to adjust your flow rate. 36 gallons / 90 minutes = 0.4 gallons per minute.
• It is best to maintain a water level above the grain bed in the mash tun at all times during transfer. To achieve this, adjust the flow rate of the 170 degree sparge water coming into the mash tun so that you maintain a water level 1"-2" above the grain bed.
• To reduce the amount of time that is required to bring the boil kettle up to boiling temps, we recommend lighting a flame under the boil kettle as soon as you have a few inches of wort collected in the boil kettle. Set the boil kettle controller to a temp slightly below boiling and you should be able to boil immediately upon hitting your target runoff volume.

Starting the boil:
• Once you hit the target runoff volume in your boil kettle stop the pump and close all liquid valves. You can begin boiling by switching the boil kettle burner control switch to 'On'. Be very careful to avoid a messy boil-over by stirring and reducing the burner output as liquid nears boiling temperatures. Once the wort is boiling adjust the flame under the boil kettle to maintain a low rolling boil.
• We recommend boiling the wort between 60-90 minutes.
• Add all hop additions to the boil either in hop bags or in stainless hop filters to avoid plugging the plate chiller with hop material.

Mash Tun Cleaning:
• To help shorten your brew day, we recommend using the boiling time to clean your mash tun. The first thing you need to do when cleaning the mash tun is make sure that you have all of the liquid completely pumped out of the grain bed. This is accomplished by simply placing the hose you were using to transfer to the boil kettle into a bucket or suitable drain as shown. Restart the wort pump and run the pump until all liquid is removed from the grain.

Brewing Instructions

Grain Removal:
Your brewing system is designed with a manway in the mash tun that makes grain removal fast and easy.

- Attached the stainless steel grain chute to the manway by hooking the sides of the grain chute over the welded brackets on both sides of the manway frame as shown in the photo below.

- Position a container to capture the spent grain underneath the grain chute. You can use a large bucket or wheelbarrow for this purpose.
- Open the manway and use either a plastic scoop or food hoe to pull the spent grain out of the mash tun.
- Once as much grain as possible has been removed from the mash tun, pull the false bottom out of the mash tun and clean separately.

Spray Down:
- Place a short hose from the bottom drain on the mash tun into a bucket or drain as shown and open the bottom drain valve.
- Use a hose end sprayer to completely spray out the mash tun making sure to rinse all visible solid material out of the kettle via the bottom drain. Any leftover grains or husks in the mash tun can plug the sprayball during CIP.
- Place the false bottom back into the mash tun.
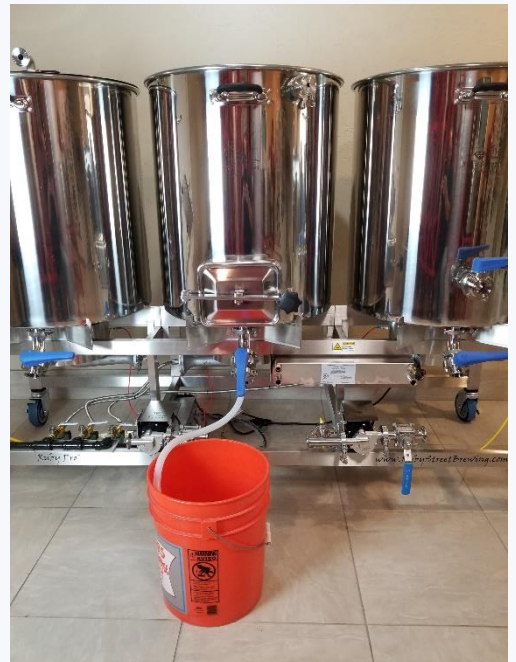
Brewing Instructions

CIP (Clean-In-Place):

- Setup your mash tun clean in place by placing the cleaning lid with the spray-ball on the mash tun and attach hoses as shown below using any pump to recirculate.

3' Hose   7' Hose

- Add 1 gallon of hot water (min 120 degrees) to the mash tun (you can use hot water from the HLT) and add 2 TBSP of PBW (Powdered Brewery Wash).
- Allow the hot PBW solution to recirculate through the sprayball for at least 30 minutes. **Do not** open the lid during this process as the hot solution will spray out.
- After 30 minutes of CIP, stop the pump, disconnect the hose from the spray-ball and place the hose into a bucket or drain.
- Remove the lid and use a hose end sprayer to rinse out the kettle and flush clean water through the pump and hoses.
- Allow the mash tun to air dry with the lid off.

Brewing Instructions

Hot Loop Sanitizing and Whirlpool
- Hot loop sanitizing is the process of recirculating near boiling wort through the pump, hoses, and plate chiller to heat sanitize all components prior to transferring to the fermenter.
- Prior to the end of your boil, arrange the hose connections on your brewery as shown below. Note that there are (2) special hoses (3' and 9') that are used to connect to your plate chiller with 3/4' clamps and gaskets.

9' Special Hose (3/4" TC ends)   **3' Special Hose (3/4" TC ends)**   **7' Hose**

- Once boiling is complete, turn off the boil kettle burner and carefully prime the wort pump
- Immediately post-boil recirculate the hot wort through the pump, plate chiller, and back into the boil kettle through the whirlpool valve. Allow the kettle to whirlpool for about 10 minutes. After whirlpool, place a lid on the kettle, stop the pump, close the pump outflow valve and allow the wort to settle for another 10 minutes.

Brewing Instructions

Prepare In-Line Oxygen (Optional)

- If your brewing system includes the in-line oxygen package, follow these directions. If not, you can move on to the next step.
- We recommend soaking the oxygen tee in a bucket of StarSan for several hours, and removing it from the StarSan immediately before use.
- If you are using a conical fermenter, connect the oxygen tee to the fermenter valve as shown (Alternatively, if you are using plastic or glass fermenters, the oxygen tee can also be placed at the plate chiller outflow).
- Open the fermenter valve, connect an oxygen tank/regulator to the oxygen tee and run oxygen through the tee for a few seconds to push any sanitizer out of the stone. We recommend setting the flow control to 1.5 LPM and pushing oxygen during the entire transfer period.

Brewing Instructions

Wort Cooling and Transfer:

- Close all liquid valves, remove the 7' hose from the whirlpool valve, and reconnect the hose to the fermenter (with the oxygen tee if equipped) as shown

- Attach a cold water garden hose to the chilling water valve in the upper right hand corner of the plate chiller. Close the water valve on the plate chiller, and turn on your cold water source. Attach a waste water hose to upper left hand connection on your plate chiller and route that hose into a suitable drain.
- Fully open the cooling water valve on the plate chiller allowing the cooling water to flow through the plate chiller and drain from the waste hose. Make sure that your fermenter is able to vent by confirming that the blow-off tube or airlock connection is unrestricted. Open the oxygen tank valve to start oxygen flow (if equipped). Open the wort pump outflow valve and start the pump. Monitor the outflow temps on the mash tun controller and use both the wort pump valve, and the cold water valve to dial in the chilling temp between 65 and 68 degrees. If the temp falls below 65 degrees, restrict the cold water flow until the proper temp is reached. If the temp rises above 68 degrees, restrict the wort flow until the proper temp is reached. Once all of the wort has transferred into the fermenter, stop the pump and immediately close the wort pump outflow valve. If you are using an in-line oxygen system, close the oxygen cylinder and disconnect the plastic tubing connector between the oxygen tee and the flow regulator. Finally close the valve on the fermenter.

Brewing Instructions

Final Cleaning:
- Remove the dome false bottom from the boil kettle and clean separately
- Disconnect the special hose from the bottom valve on the boil kettle and leave all other hoses connected.
- Attached a hose from the bottom valve on the boil kettle and place it into a bucket or suitable drain and open the bottom drain valve.
- Use a hose end sprayer to completely spray out the boil kettle making sure to rinse all visible solid material out of the kettle via the bottom drain. Any leftover material in the boil kettle can plug the spray-ball during CIP.
- Setup hoses exactly like you did for the hot loop sanitizing step earlier as shown.

- Add about 2 gallon of hot water to the boil kettle mixed with 4 Tbsp of PBW. Open the valves and start the pump to recirculate PBW through the pump and plate chiller for 5 minutes in the forward direction.
- Stop the pump, close the valves and switch the two wort connection hoses on the plate chiller in order to reverse the flow through the plate chiller. Run the recirculation loop again for another 5 minutes in the reverse direction through the plate chiller.
- Remove the 7' hose from the whirlpool valve and place into a bucket or drain and pump the remaining PBW solution out of the boil kettle and plate chiller.
- Rinse the boil kettle with clean water allowing the clean water to run through the hoses, pump and plate chiller to rinse all cleaning solution out of the chiller.

Brewing Instructions

CIP (Clean-In-Place):
- Setup your boil kettle CIP by placing the cleaning lid with the spray-ball on the boil kettle.
- Attach hoses to use the wort pump to recirculate the boil kettle similar to when you ran the CIP loop on the mash tun.
- Add 1 gallon of hot water (min 120 degrees) to the boil kettle (you can use hot water from the HLT) and add 2 TBSP of PBW (Powdered Brewery Wash).
- Allow the hot PBW solution to recirculate through the spray-ball for at least 30 minutes. **Do not** open the lid during this process as the hot solution will spray out.
- After 30 minutes of CIP, stop the pump, disconnect the 7' hose from the spray-ball and place the hose into a bucket or drain.
- Remove the lid and use a hose end sprayer to rinse out the kettle and flush clean water through the pump and hoses.
- Allow the boil kettle to air dry with the lid off.

Brewing Instructions

Left Side Pair (2 BBL Operation)

- The following images show the hose connections necessary for simultaneous (2 BBL) brewing using the left side pair in addition to the right side pair. Completely familiarize yourself with the operation and cleaning of the system using only the right side pair before attempting simultaneous brewing.
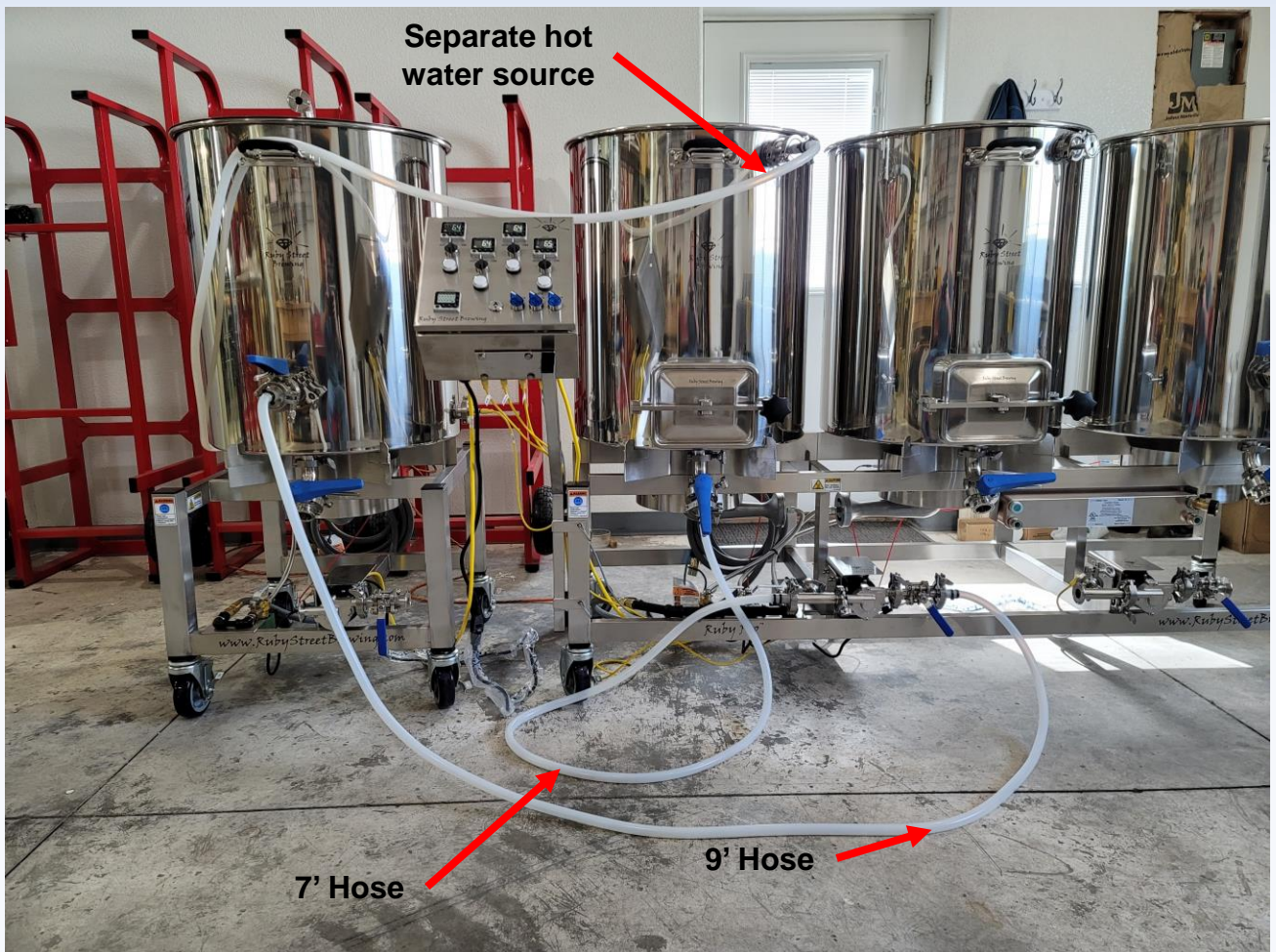
HOSE ARRANGEMENT FOR MASHING

7' Hose

9' Hose

Brewing Instructions

Left Side Pair (2 BBL Operation)

HOSE ARRANGEMENT FOR SPARGING

Brewing Instructions

HOSE ARRANGEMENT FOR WHIRLPOOL

7' Hose

9' Hose

Brewing Instructions

Left Side Pair (2 BBL Operation)

HOSE ARRANGEMENT FOR COOLING AND TRANSFER

9' Special Hose
(3/4" TC ends)

3' Special Hose
(3/4" TC ends)

7' Hose

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 control unit
- 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 kettles are not displaying temperature
- 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 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)

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 4 burners and follow these steps to diagnose
    - ALL 4 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 INTERMITENT 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 proof. 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 frame , kettles, or components attributable to improper handling or freight damage; damage resulting from improper storage; damage to the pump, motor, plumbing, and components due to improper maintenance; 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 silicone tubing, o-rings, and gaskets. The warranty also excludes any deterioration, burning, or discoloration of the applied finish on the frame and or burner grates. 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, Nunn, CO