MB BREWHOUSE SYSTEM

OIL HEATED BREWHOUSE INSTRUCTION MANUAL

Thank you for purchasing your MoreBeer! Oil Heated Brewhouse System. This manual is intended for professional brewers who will operate the Brewhouse and assumes you have professional brewing experience. We designed this system to be flexible so there are many ways to utilize the system to fit your needs. We encourage you to be creative with the process! Here we will describe one process to get you started.

IMPORTANT SAFETY INFORMATION

Please read this entire instruction manual for important safety information prior to the use of your Oil Heated Brewhouse System.

⚠WARNING The red sleeves on the oil piping are very hot. Do not touch them or their attaching points. Severe burns or injury will occur.

⚠WARNING The supplied casters are for the initial moving only. Please remove after installation.

⚠WARNING Some valves can release hot water. Always check both ends of any pipe before opening a valve.

⚠WARNING Hot water and hot wort can cause life-threatening burns.

⚠WARNING Hoses on the floor are a tripping hazard.

⚠WARNING Do not operate the system if any wiring is exposed. Stop and repair the system before proceeding.

NOTE: Please refer to the controller manuals for their operation. We have pre-programmed the PIDs to default settings.

INSTALLING YOUR SYSTEM

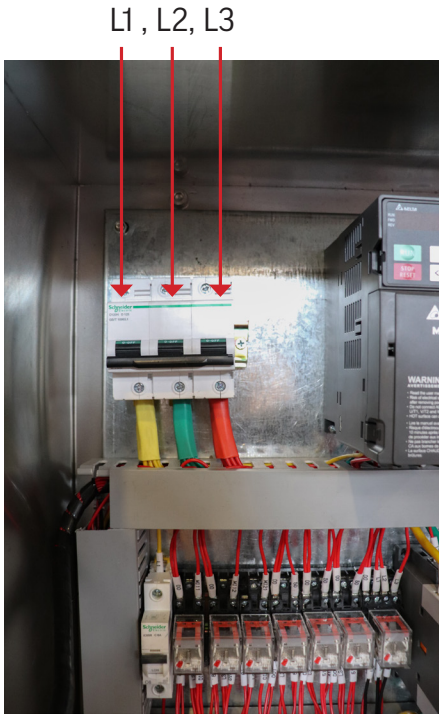
If your system arrives crated, you will need to remove the front and back panels to unbolt the system. Once the system is unbolted you will need to lift it out. We recommend using a forklift under the skid. The center of balance may not be the center of the system, so lift slowly and check.

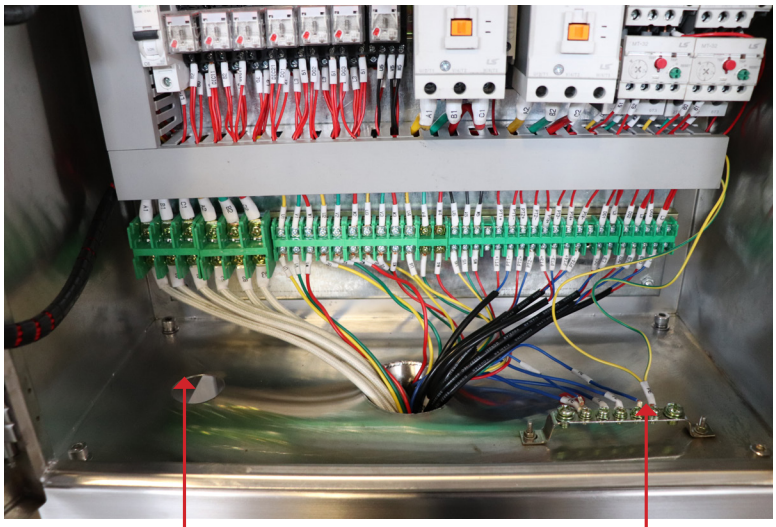
The skid will have some temporary castors installed to facilitate moving. They are not intended for permanent use. Care must be taken when rolling over cracks in the concrete. You may need a floor jack or a forklift to get over cracks.

Once in place, lift the system and remove the casters. The system comes with adjustable feet to level the system. When adjusting the feet, do not flex the skid as it will put tension on the upper tri-clamp fittings. Adjust the feet until the skid is straight and level.

NOTE: The supplied castors are for the initial moving only. Please remove them after installation.

ELECTRICAL HOOKUP





⚠WARNING This system will need to be wired by a commercial electrician as there are code restrictions that are not included in this guide.

- The conduit attaches to the open hole in the bottom of the panel.
- The hot leads from your 3-phase power are connected to the breakers. They are marked L1, L2, and L3 in this diagram. If your motors spin backwards, you will need to reverse any two wires. For example, swapping L1 for L2.
- The ground will attach to the ground bus shown in the lower right on the panel.

NOTE: The location of your breakers may be different in your panel to accommodate the specific size of your system. They are marked in the international standard colors of Yellow, Green, and Red. The international standard for ground is yellow with a green stripe.

WATER HOOKUP

The incoming water pipe will be located near the floor. Since the location of the pipe varies per system, the easiest way to identify the correct pipe is to trace it from the boil condenser.

DRAINS

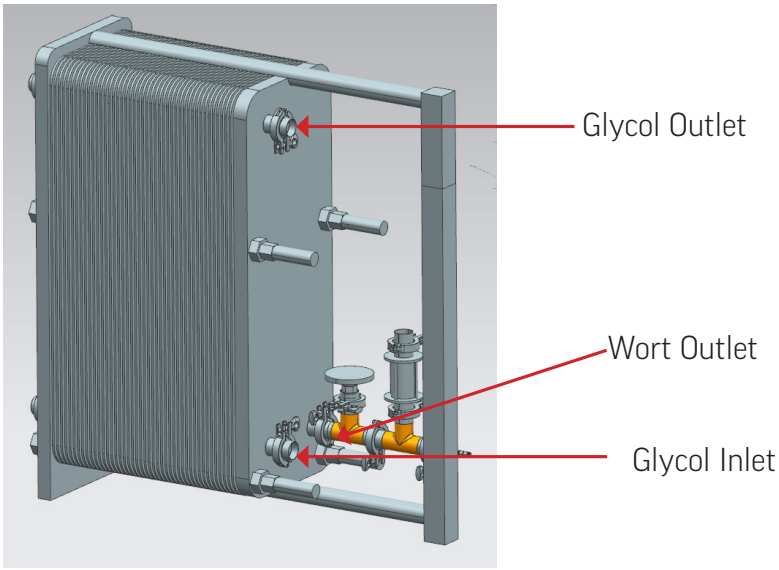
There are many places to drain the system. You can pick any of them. If you have a trench floor drain you will likely use a different one at different times.

If you are plumbing, you will need to pick the drain outlet closest to your drain. An air gap is required in the drain.

⚠WARNING Do not hard pipe your system to a drain. If you inadvertently create a vacuum in your drain, it can pull raw sewage in.

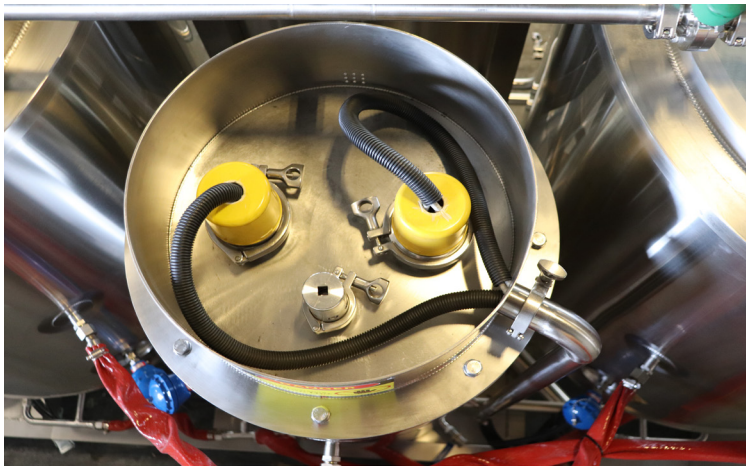
⚠WARNING Please wear protective foot wear during operation as you will be draining hot fluids from your system.

CHILLED LIQUOR HOOK UP



Your heat exchanger has the first stage hard piped into the system. You have the option to collect the wastewater to the HLT or drain the water out the left side of the system. If you have a two-stage heat exchanger you will need to connect soft tubing from your glycol system to the front of the heat exchanger in the locations shown.

FILLING WITH OIL



Before heating your system you will need to purchase and add oil. We recommend PARATHERM™ MR HTF or an equivalent low-odor, food-grade, thermal transfer fluid. Only use the exact amount required for your system. There is a dipstick included with your system to check the oil level. There must be a head space above the oil to allow for the oil to expand while heating. Oil is added by removing the PRV. See the Maintenance Section for Oil Volumes.

⚠WARNING Only remove the PRV when the system is completely cold. The PRV is set to 0.2 BAR so the oil is only ever under very low pressure.

CONTROL PANEL

⚠WARNING Disconnect power before opening the control panel.

The control panel has 4 PID controllers and 2 Variable Frequency Drives (VFD).

KILL SWITCH:

The emergency stop button can be engaged by pushing on it to stop the system. Twist to release.

OIL TEMP:

You will need to set the oil temperature first. You can have different oil temperatures for different parts of the process if you desire. If you are going to set and forget the oil temperature you will need to set it to the proper boil evaporation rate. (We recommend you start at 160°C and adjust from there.)

HLT TEMP:
Set the HLT temperature to your strike temperature. The switch controls whether the controller is On (It is always on regardless of the controller), Off, or Automatic (Set by the controller.)

MASH TEMP:
Set the mash to your first mash step.

BK TEMP:
Set the boil temperature to well above 100˚C to keep the PID from slowing down the ramp to boil. (We recommend 150˚C.)

OIL PUMP SWITCH:
Turning On will circulate the oil constantly. Turning Off will disable the pump. Auto will allow the kettles to turn on the pump when the Oil is needed.

HLT PUMP SWITCH:

Turns on and off the HLT pump. Make sure the pump has liquid in it before turning it on to keep from burning up the seals.

BK PUMP:
This turns on the main pump for the system. It is used for moving wort while recirculating, knocking out, and for CIP.

⚠WARNING Do not run pumps dry, seal failure will occur.

BK PUMP VFD:
This dials in the speed of the main pump for recirculation, transfer, and CIP.

MLT RAKE:
The mash tun rakes are used to stir the mash during mash in and for graining out. It is a three-position switch that reverses direction with a center-off position.

MLT RAKE VFD:
This sets the rake speed.

NOTE: Your control panel may have a different layout to accommodate the shape of your panel but all systems have the same features.

OIL TIMER (FIRST GENERATION):

- Set the countdown interval on the timer.
- Set the Timer to the ON position.
- Set oil temperature.
- Set oil temperature switches to AUTO.
- Set HLT temperature.
- Set HLT to AUTO .
- Set the oil pump to AUTO. (The oil pump will move cold oil all night).
- When the timer expires the oil will heat and start heating the HLT.

OIL TIMER (SECOND GENERATION):

- Set the countdown interval on the timer.
- Turn the switch under the timer to the ON position.
- Set the oil temperature.
- Turn the oil element switches to AUTO.
- Set the HLT temperature.
- Set the HLT to AUTO. (The Oil pump will not turn on till the timer expires.)
- Set the oil pump to AUTO.

HLT SETUP

If your oil system has an HLT that is off the skid, you will need to plumb it in. Unwrap all the piping and lay it out in a clean space. The connection and the pipe end are numbered to help you identify the parts. The pump will be placed on the left side of the HLT near the HLT. Attach the two pipes that connect to the top of the HLT.

The oil pipes come retracted on the skid. You will need to loosen the clamps and slide them out. Connect the two process pipes to the stand and block them up. This will set the distance to the pump.

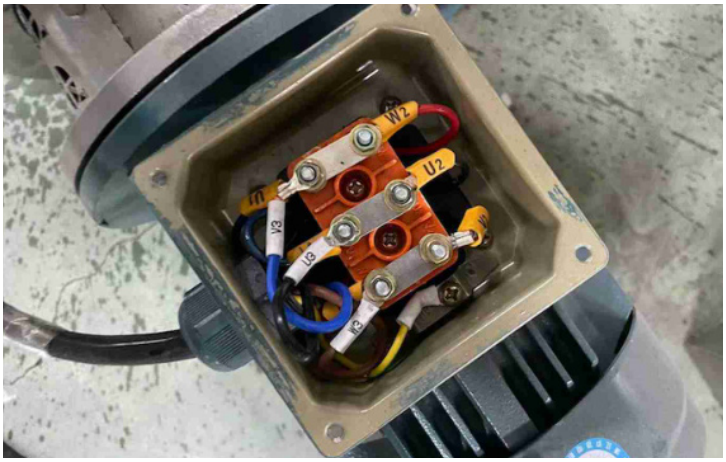
Find the pipes that connect to the pump and attach them. Then you only have the two interconnect pipes to install. You may need to adjust the height of the HLT to align everything with the pump:

Find the pipes that connect to the pump and attach them. Then you only have the two interconnect pipes to install. You may need to adjust the height of the HLT to align everything with the pump:

If the kettle condenser was removed, you will need to attach it and tighten the bracket. Then, install the condenser CIP piping.

To connect the oil system, loosen the clamps holding the stainless covers over the oil hoses. Slide the metal out a few feet until they go behind the pump. Firmly tighten the hose ends to the HLT. Do not use Teflon tape. Next, you will wire the motor and solenoid. Pease use outdoor rated wire nuts:

Motor Wiring:



Solenoid Wiring:

Finally, Attach the thermocouple with a tri clover clamp:

BEFORE YOUR FIRST BREW

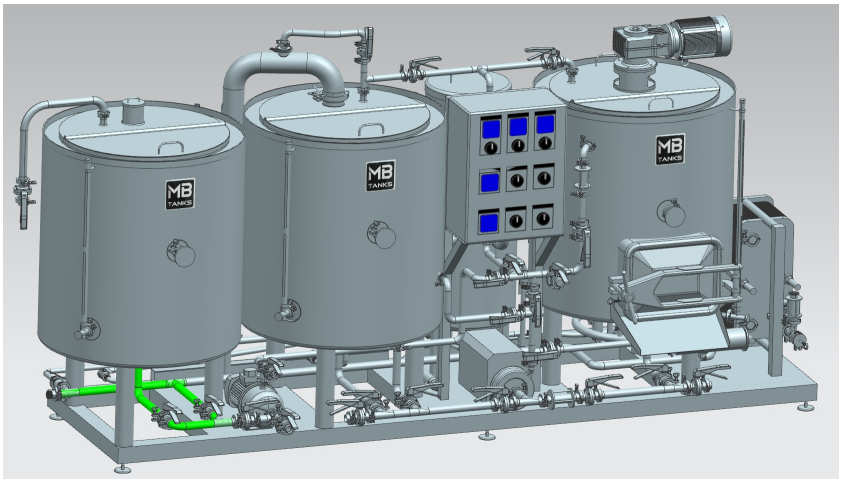
Before brewing you will need to clean the system. This will give practice with the CIP operations, clean any residual oil and remove any debris from manufacturing and shipping.

You can use your standard brewery chemicals in your system. If you do not have a preferred chemistry we recommend you find a local supplier and follow his recommendations. We use Birko Cir-Q-late followed by Birko Acid brite #2.

NOTE: The transluscent tank in the following images refer to which tank is being used while the opaque tanks signfy they are not in use.

BREWING STEPS

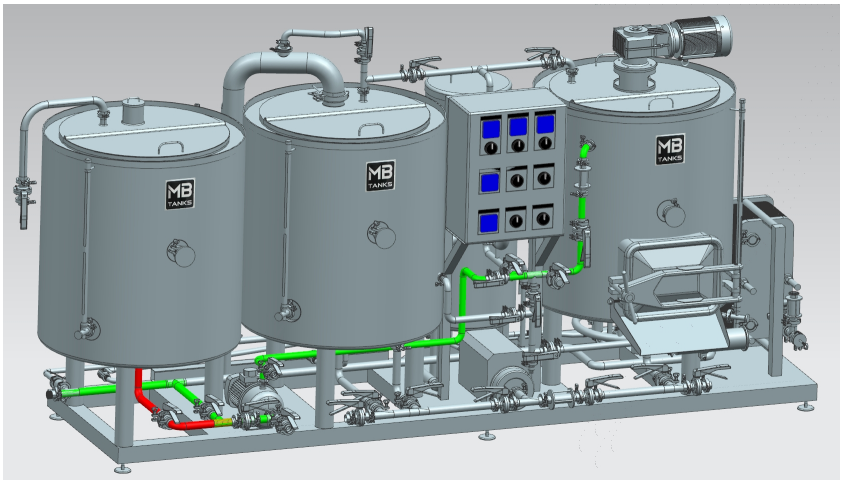
FILL HOT LIQUOR TANK (HLT)



SET TIME AND HLT TEMPERATURE

Refer to the control panel section for more specific information.

FOUNDATION WATER



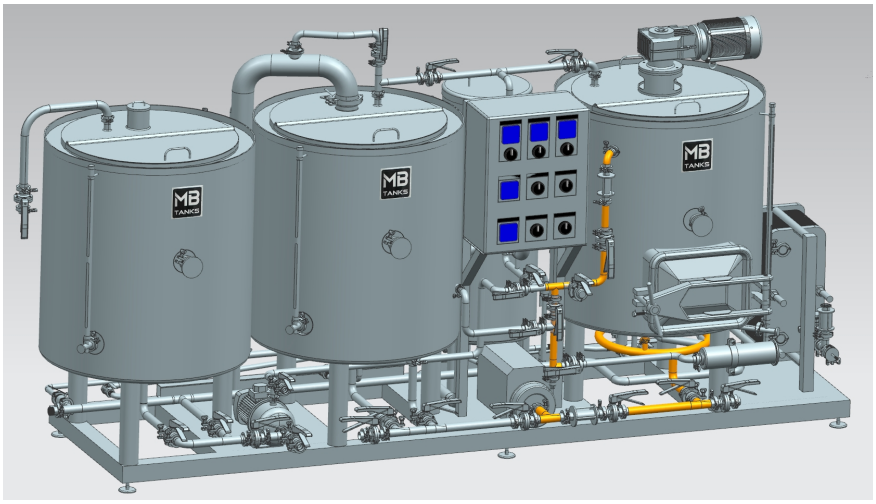
Fill the mash tun till you have about 2” of liquor above the screen. You may blend in cold water ahead of the pump to set the temperature if desired.

NOTE: It is also possible to preheat foundation water in the mash tun.

MASH IN

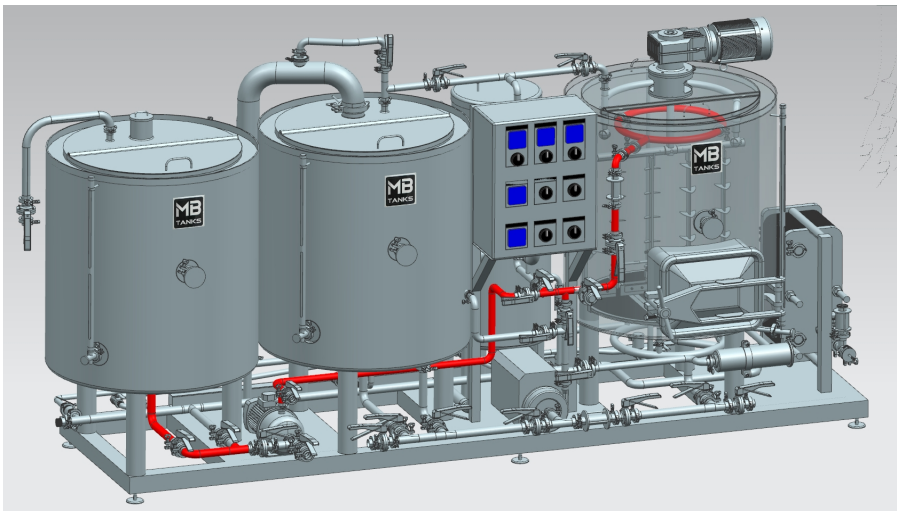
Using the same valve settings as foundation water, turn on the (optional) rake and start grain flow. (If you have the optional foremash, you will turn it on as the grain starts flowing). The rake will make sure the grain is wetted evenly and drive off any air.

RECIRCULATE

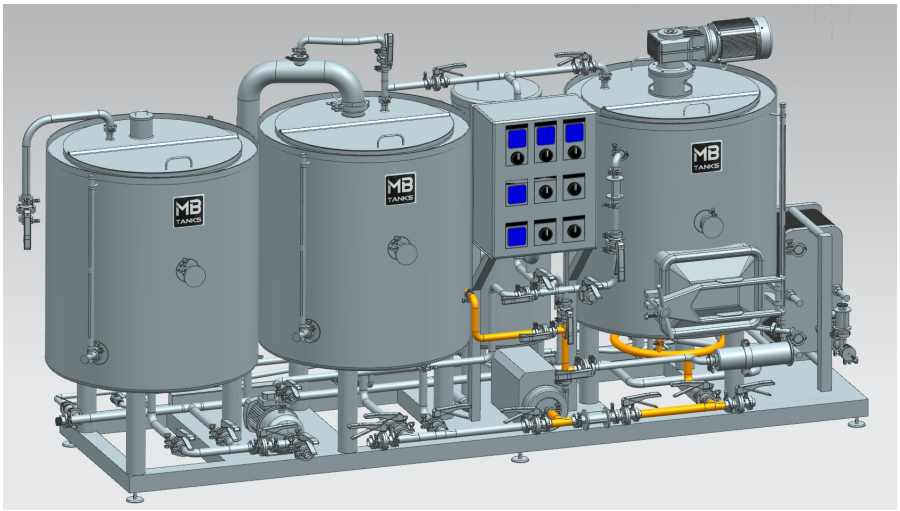


Recirculate the mash to move any particulates (that have worked through the mash screen), back to the top of the mash. You can use the oil jacket to ramp temperature for step mashing or to maintain temperature during this process.

LAUTER



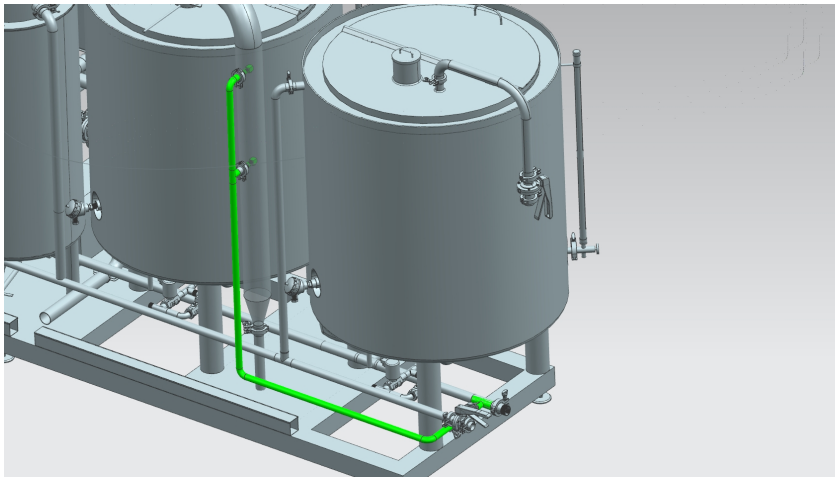
Add water to the top of the mash



Pull the wort from the bottom of the mash and pump it into the boil kettle.

IMPORTANT: Make sure the sight glass is open. This is an important safety feature that will keep your screens from collapsing in a slow or stuck mash.

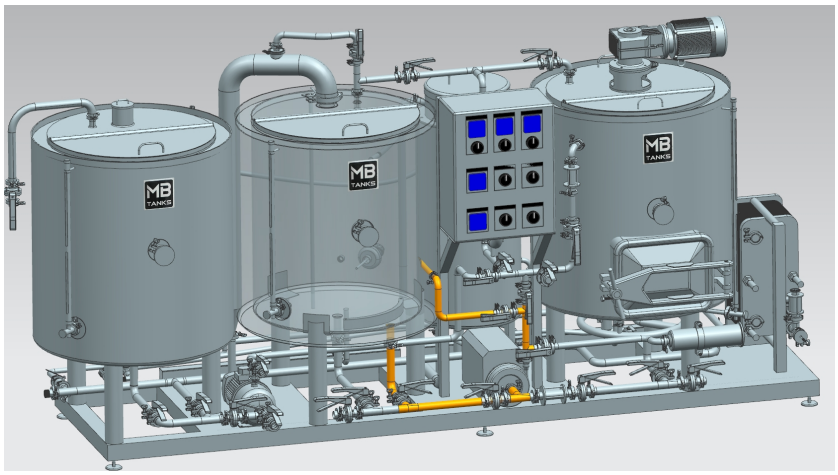
BOIL



While the boil kettle is filling you may start heating the wort in the boil kettle. Adjust the oil temperature to ensure you have a vigorous boil, 160˚C is a good place to start.

Turn on the cold water to the boil steam condenser. Do not turn on the condenser CIP ball. The valve for the cooling water to the condenser is near the water inlet.

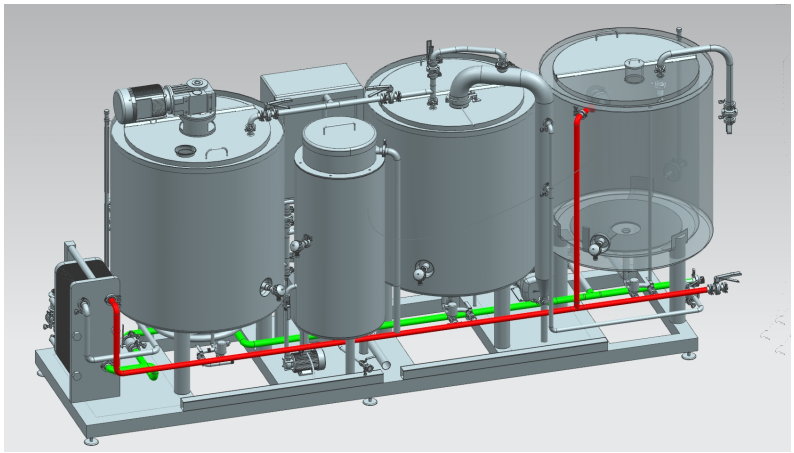
WHIRLPOOL



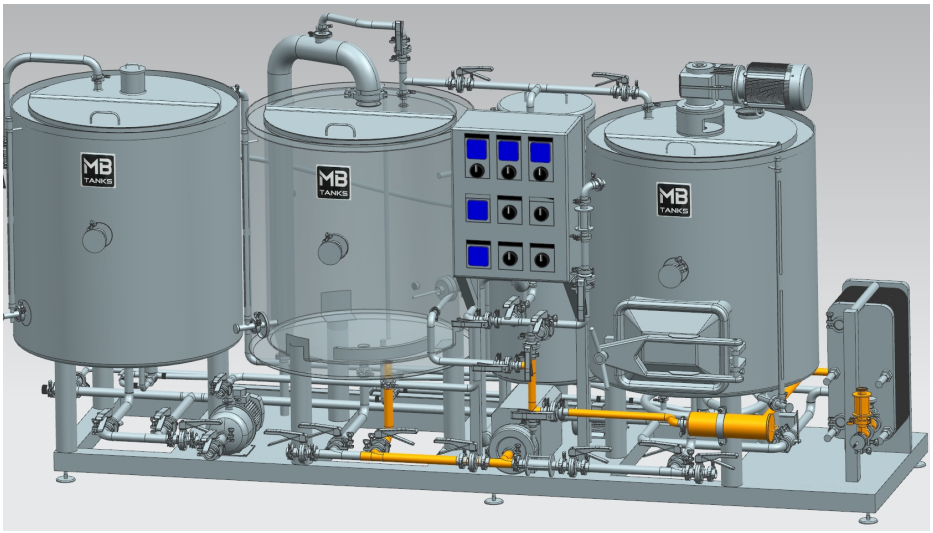
Whirlpool till you have maximum velocity in the boil kettle and then shut off the pump and let the trub settle. Slowly ramping up the pump can help avoid pump cavitation.

TRANSFER - HEAT-X

Using the same valve settings as foundation water, turn on the (optional) rake and start grain flow. (If you have the optional foremash, you will turn it on as the grain starts flowing).



Start the cooling water. Green is the incoming water. Red is the return to the HLT to save water for the next brew. Or it can be drained out the left side of the system. (For a two-stage exchanger you will need to start the chilled liquor from your supply as well.)



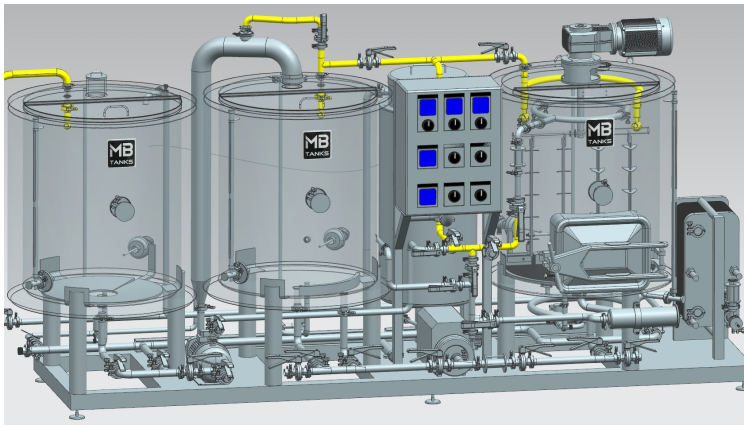
Transfer the wort through the heat exchanger. There is a large particulate filter to keep hops from entering the heat exchanger. There is also an oxygen stone attached below the sight glass for wort oxygenation.

GRAIN OUT

If you have the optional rakes, you will open the door, attach the grain chute, release the chain holding the grain sweep on the rake, and run the rakes in reverse.

⚠WARNING The rakes can catch tools and limbs. Do not reach into the mash with tools or your hands without shutting off the rakes.

CLEANING



⚠WARNING Wear eye protection while using cleaning chemicals.

Each vessel has a CIP ball. Additionally, the steam condenser has a CIP ball. Each brewer must create their own cleaning schedule. Provided as an example:

- Remove the mash screens and spray out grain: Daily
- Remove the hop filter and clean out: Daily
- Recirculate caustic in the heat exchanger: Daily
- Recirculate caustic in the boil: Daily
- Rinse the steam condenser: Daily
- Caustic the steam condenser: As needed
- Recirculate brewers wash in the mash tun: Weekly
- Acid rinse the HLT: As needed to prevent scale
- Disassemble and clean Heat-X: Yearly

MAINTENANCE

When the efficiency of thermal transfer from the oil diminishes, you will need to change the oil. Use a food-grade thermal transfer fluid such as PARATHERM™ MR HTF or an equivalent low-odor, food-grade, thermal transfer fluid.

⚠WARNING The heating elements must be covered with oil before applying power. Permanent damage to the elements will occur if they are run dry.

If the pumps leak, you need to replace the seals. It is a good idea to always have a spare pump seal kit on hand. Pump seals last a very long time if you take care to never run them dry. The moving fluid cools the seal.

You will need to disassemble and clean the heat exchanger on a schedule. Once per year is recommended.

IMPORTANT: Make sure the orientation of the plates and their order is never changed!

When reinstalling do not over-tighten the plates. Only tighten the nuts till there are no leaks. It is important to tighten the bolts evenly. Measure the plate separation of the four corners of the end plates to ensure you are tightening evenly. Each time you tighten down the plates, the gaskets will get a little smaller. Once the plates are metal on metal you will have to replace the gaskets. Order a gasket replacement kit before disassembling the heat exchanger to limit downtime. The gaskets are glued in place and removal and replacement is tedious and time-consuming. Allow yourself plenty of time and be meticulous. Use a food grade heat exchanger gasket glue such as Alfa Laval GC8 (189990025).

SPECIFICATIONS

Size	Gross Volume (All Vessels)				Oil Volume (Net Volume)				Total Electrical Power		Total Amps 208V	
1 BBL	142	L	37.52	Gal	40	L	10.57	Gal	9.7	kw	27	Amps
1 BBL w/ Rake	142	L	37.52	Gal	40	L	10.57	Gal	10.2	kw	28	Amps
2 BBL	330	L	87.19	Gal	50	L	13.20	Gal	16.4	kw	46	Amps
2 BBL w/ Rake	330	L	87.19	Gal	50	L	13.20	Gal	16.4	kw	46	Amps
3 BBL	495	L	130.78	Gal	100	L	26.42	Gal	33	kw	91	Amps
3 BBL w/ Rake	495	L	130.78	Gal	100	L	26.42	Gal	33	kw	91	Amps
3.5 BBL	561	L	148.22	Gal	100	L	26.42	Gal	32	kw	89	Amps
3.5 BBL w/ Rake	561	L	148.22	Gal	100	L	26.42	Gal	33	kw	91	Amps
5 BBL w/ Rake	810	L	214.00	Gal	150	L	39.63	Gal	39	kw	108	Amps
7 BBL w/ Rake	1125	L	297.23	Gal	250	L	66.04	Gal	63.4	kw	176	Amps
10 bbl w/ Rake	1678	L	443.33	Gal	280	L	73.97	Gal	63.8	kw	177	Amps