

BoilerMaker Surface™



Assembly, Operation, & Maintenance

Congratulations on your purchase, and thank you for selecting the BoilerMaker Surface™ brew kettle from Blichmann Engineering. We are confident that it, and our suite of accessories, will provide you years of service.



IMPORTANT INFORMATION

PLEASE READ THIS MANUAL THOROUGHLY PRIOR TO USE FOR IMPORTANT SAFETY INFORMATION!

- WARNING:** Sections labeled “Warning” can lead to serious injury or death if not followed. Please thoroughly read these sections and understand them completely before use. If you any questions, contact your retailer or Blichmann Engineering (www.BlichmannEngineering.com) before use.
- CAUTION:** Sections labeled “Caution” can lead to equipment damage or unsatisfactory performance of the equipment. Please read these sections thoroughly. If you have any questions, contact your retailer or Blichmann Engineering (www.BlichmannEngineering.com) before use.
- IMPORTANT:** Sections labeled “Important” should specifically be followed to ensure satisfactory results

What’s In the Box?

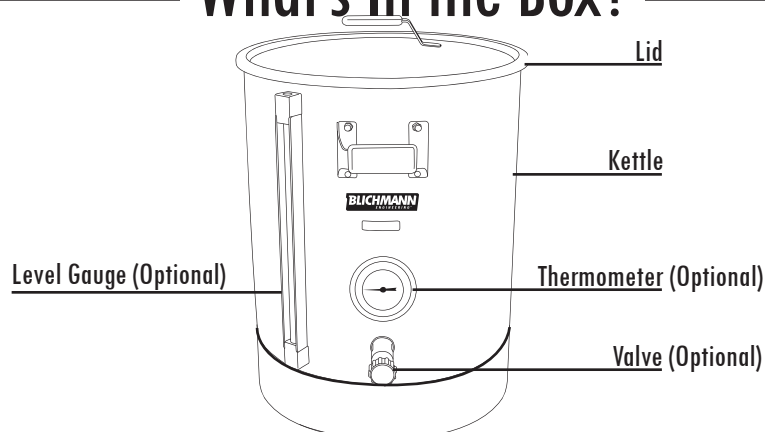


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FIRST TIME CLEANING

IMPORTANT INFORMATION

After you have received your new equipment and removed it from the box it is very important that you properly clean the equipment thoroughly with a general detergent such as Dawn dish soap. This will remove any debris and oils that may have been left behind from shipping and the manufacturing processes.

Cleaning and sanitizing all your home brew equipment before every use is an important aspect of brewing. Using good cleaners and sanitizers can make the difference between having a great beer and a spoiled one. Good preparation for your upcoming brew day is key. Make a checklist of the equipment you will be using and note whether it needs to be sanitized or only cleaned. In prepping for your brew day, always make sure your equipment is ready to go when you are.

Caution: DO NOT SUBMERSE KETTLE IN LIQUID ALWAYS START WITH A CLEANING AGENT

Before you do any sanitizing, you need to thoroughly clean your equipment. Sanitizers do not work on equipment with soils on the surface, and bacteria and wild yeasts will remain. It is always best to immediately wash your equipment after use while the soils are soft and easier to remove.

There are a number of good cleaning agents on the market. One Step™, Straight-A™, and Powdered Brewery Wash™ (PBW) are three of the most popular. These products may be used on bottles, fermenters, and other equipment. Cleansers should be rinsed after use. Don't soak your equipment in a cleansing solutions for longer than the time recommended on the packaging, or you can damage your equipment.

As with ALL chemicals. ALWAYS thoroughly read the instructions, material compatibility, and safety warnings. Never use more than the recommended concentrations or soaking times or you may damage your equipment.

Cleaning Stainless Steel and Aluminum

For general cleaning of stainless steel and aluminum, mild unscented detergents, PBW, or percarbonate-based cleaners are excellent choices. Bleach should not be used to clean or sanitize stainless steel or aluminum as it will corrode and pit them.

SANITIZING

Only when your equipment is clean, can you sanitize it.

All items that contact the wort or beer below 140F need to be sanitized. This includes the fermenter (including the lid), airlock, rubber stopper, yeast rehydration or starter container, thermometer, funnel, spoon, and siphon etc. On bottling day, bottles, caps, hoses etc. also need to be sanitized. Chemical sanitizers can be prepared in a bucket and used throughout the brew day. Chemical sanitizers are by far the most common. Most can be used on metal, plastics and glass. Most do not require rinsing; a good feature since your tap water, particularly well water, may contain small amounts of bacteria. Again, always follow the manufacturer's recommendations for concentration, contact time, and the need to rinse before use.

Five Star Chemicals™ StarSan™, and Iodophor are the most popular sanitizers on the market. Always use according to the manufacturer's directions.

If you have a particularly tough stain, liked burned malt extract, stains, or other buildup, Barkeepers Friend (oxalylic acid) works very well to remove them from metallic surfaces. This product is available at your local grocery store.

AFTER USE CLEANING

For keeping your equipment clean and looking new, we strongly recommend cleaning immediately after brewing as soils and residue will be much easier to remove before it dries. Never toss components in a bucket of cleaning agents "to clean tomorrow" as these chemicals may damage the product if you exceed the recommended contact time.

Once you've thoroughly cleaned your stainless products, wipe them dry with a towel and let them air dry thoroughly. A clean surface will instantly passivate once it is dry, leaving a durable corrosion resistant surface.

John Palmer also has a more in depth discussion about removing rust and how to passivate stainless steel at this link - <https://bit.ly/2VrZ1u8>.



DIMENSIONS AND WEIGHTS

BoilerMaker™ Brew Kettle Models (gal.)	10 Gal Surface	20 Gal Surface	7.5 Gal	10 Gal	15 Gal	20 Gal	30 Gal	55 Gal
Recommended Boil Capacity (finished batch size)	5	10	5	5	8	10	15	32
HLT Capacity (approximate)	8	17	7	8	13	13	25	48
1.00 qt/lb (Mash Capacity of grain at 75% full)	26	54	18	26	38	54	75	130
1.25 qt/lb (Mash Capacity of grain at 75% full)	22	45	15	22	32	45	63	109
1.50 qt/lb (Mash Capacity of grain at 75% full)	19	39	13	19	27	39	54	94
1.75 qt/lb (Mash Capacity of grain at 75% full)	16	34	12	16	24	34	48	83
2.00 qt/lb (Mash Capacity of grain at 75% full)	15	31	10	15	22	31	43	74
Approximate lauter rate (gpm)	0.19	0.33	0.17	0.19	0.25	0.33	0.4	0.55
Min Recirculation rate (gpm) for RIMS or HERMS	0.75	1.25	0.65	0.75	1	1.25	1.5	2.25
Kettle dead space (gal.)	0.12	0.22	0.1	0.12	0.17	0.22	0.35	0.52
Volume to thermometer stem (gal.)	4	7.4	3.1	4	6	7.4	9.3	13.4
Weight	18.1 lbs	28.8 lbs	11.4 lbs	13.6 lbs	19.8 lbs	27.4 lbs	27.4 lbs	37.6 lbs
Height (Add 2.25" for Lid)	22"	26.5"	14.8"	16.4"	18.25"	20.7"	23.6"	28.3"
Sidewall Diameter	13.9"	17.7"	12.3"	13.9"	16"	17.7"	19.7"	23.6"

POWER AND CONNECTIONS

BoilerMaker Surface Kettle Size	Power	Amp	Receptacle (NEMA)	Voltage	GFCI Breaker Size
10 Gallon	3500	14.6	L6-30	240	30
20 Gallon	5500	23	L6-30	240	30

Warning: The Surface™ electric kettle is only to be used in conjunction with a Ground Fault Circuit Interrupter (GFCI) protected power source. If you are uncertain about the status of your power source contact a licensed and qualified electrician familiar with National Electric Code standards before proceeding. Operating the BoilerMaker Surface™ heater in any fashion other than described in this manual can result in personal property damage, injury, electrocution or death.

Warning: NEVER plug the Surface™ electric immersion heater directly into a power source. ALWAYS use a power control device capable of de-energizing the heater coil.

Warning: NEVER plug in or unplug the heater cord when energized. Doing so will result in arc damage to electrical connections.

Caution: Before connecting and energizing the Surface Kettle, verify that it has at least 1in of water or wort covering the bottom of the kettle.

Warning: Never energize the Surface Kettle without the bottom fully submerged. "Dry firing" the Surface™ will cause the heating element to reach excessive temperatures which can create a dangerous situation which can result in product damage or personal injury.

WARNING: * Safety should be the highest priority of any brewer. Use common sense! *****

Do not IN ANY SITUATION lift or move any kettle when full with water. A kettle full of hot water may easily be spilled causing burns. Use a pump or siphon/gravity drain to move liquids from one kettle to another! Pots of this size are extremely heavy when full and lifting can cause back injury and severe burns. The handles are provided solely for moving the EMPTY kettle. Do not risk injury to yourself or others to save a few minutes of inconvenience.

ALWAYS brew on a stable surface to prevent accidental tipping.

CAUTION: NEVER brew where children are, or may be present, and never leave your brew kettle unattended.

DOS AND DON'TS

NEVER:

- **NEVER leave this equipment unattended**
- **NEVER allow children near this equipment**
- **NEVER heat cooking oil with this equipment**
- **NEVER immerse the base in liquid**
- **NEVER operate on soft, uneven surfaces like dirt, gravel, or asphalt**
- **NEVER use near or with combustible chemicals, gasoline or other flammable vapors or liquids**
- **NEVER bypass the GFCI circuit protection**
- **NEVER operate any equipment with frayed or damaged power cables**
- **NEVER expose electrical connections to moisture**
- **NEVER connect heater cable assembly directly to power source**
- **NEVER modify or alter the supplied electrical cables or connectors**
- **NEVER operate kettle with higher than rated voltage**
- **NEVER unplug kettle when energized**
- **NEVER energize the kettle without a minimum of one inch of liquid in the bottom.**

ALWAYS:

- **ALWAYS use kettle with rated voltage**
- **ALWAYS unplug kettle when de-energized**
- **ALWAYS use on level and stable hard surfaces**
- **ALWAYS connect to a GFCI circuit**
- **ALWAYS check power cables and connectors for signs of damage or wear prior to each use**
- **ALWAYS use approved control device between heater and GFCI power source. This plug is NOT a switch.**
- **ALWAYS use genuine Blichmann Engineering replacement parts**
- **ALWAYS unplug before moving**
- **ALWAYS allow the brew kettle to fully cool before handling**
- **ALWAYS wear appropriate personal protective equipment, such as gloves, clothing and footwear to prevent burns and scalds**

BOIL KETTLE

ASSEMBLY

Connect the power cable to the receptacle of the Surface™ and to a power or temperature controller, such as the BrewCommander™(sold separately).

Install the optional Brewmometer™, per its product specific assembly manual, to observe temperature. Alternatively, install your controller's optional temperature probe into the kettle to maintain temperature.

Install optional accessories as needed, referring to the later section of this manual for assembling valves, and any manual specific to the optional accessories for their assembly.

OPERATION

Whirlpool Kit (included with NPT models, optional on tri-clamp models) - Recirculate through the whirlpool arm, at the end of the boil, to collect hop matter and other solids in the center of the kettle as well as decrease chilling time with an immersion chiller. This kettle is compatible with immersion style heat exchangers as well as external heat exchangers like the Therminator™.

If using a temperature probe, be sure that it is always submerged in liquid during use. Read the temperature on the display screen of the controller or read from an optional analog thermometer directly installed on the kettle. The Boil Kettle is best operated using power control, adjust your power up or down to achieve a rolling boil that is not foaming over.

Rotating Dip Tube (optional) - Use of a rotating dip tube allows you to pull clear wort from above hops and trub that have settled on the bottom of the kettle. While transferring out of the kettle at the end of the boil, start with the dip tube oriented horizontally and rotate downward until desired liquid level is achieved.

Tips: To prevent boil overs, add fermcap or other foam suppressant at the start of the boil. It is standard practice to boil with the lid off to allow the escape of volatile compounds that may poorly affect the flavor of your beer.

HOT LIQUOR TANK

ASSEMBLY

Connect the power cable to the receptacle of the Surface™ and to a power or temperature controller, such as the BrewCommander™(sold separately).

Install the optional Brewmometer™, per its product specific assembly manual, to observe temperature. Alternatively, install your controller's optional temperature probe into the kettle to maintain temperature.

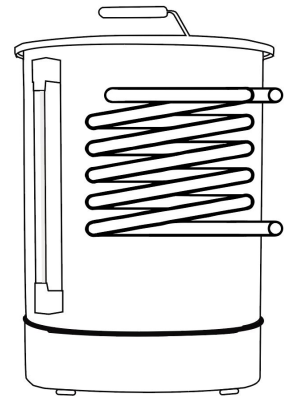
Install optional accessories as needed, referring to the later section of this manual for assembling valves, and any manual specific to the optional accessories for their assembly.

OPERATION

Fill the kettle to no more than 80-85% full to allow for expansion of the water as it heats. The Hot Liquor Tank is best operated using temperature control, setting your controller to Auto with a specified set temperature. Be sure that the temperature probe for the controller is always submerged in liquid during use. While draining the Hot Liquor Tank, de-energize the Surface when liquid level reaches the temperature probe to avoid over-heating the liquid or a dry-fire condition. Damage to the kettle may occur.

Herms Coil (optional) – The herms coil is used to maintain mash temperatures by recirculation the wort, from the Mash Tun, through the heated Hot Liquor Tank. Set the temperature of your Hot Liquor Tank to be 5 degrees above your desired mash temperature (3 degrees if using a Whirlpool Kit). Recirculate your mash water through the Herms Kettle. See the HERMS Coil manual for more information.

Tip: in lieu of a HERMS coil, the Surface can be used as a mash tun to add heat as needed, without the complication and additional plumbing or RIMS or HERMS System.



Whirlpool Kit (optional) - Use the Whirlpool Kit and a pump to re-circulate water through the Hot Liquor Tank to increase heating efficiency if using a HERMS coil. This reduces time to strike by 30%, and reduces the HLT-MP temperature differential by a couple degrees.

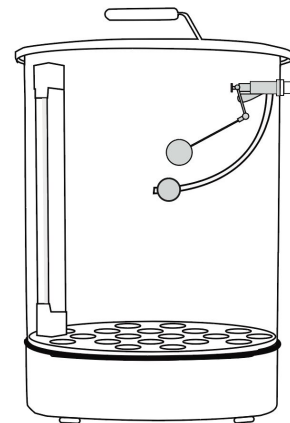
Tip: Prior to pumping hot liquor to the MT, stir the liquid to create a more even temperature.

MASH TUN

ASSEMBLY

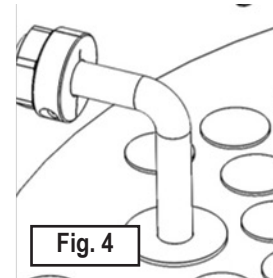
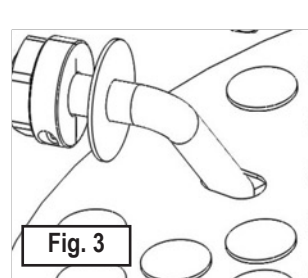
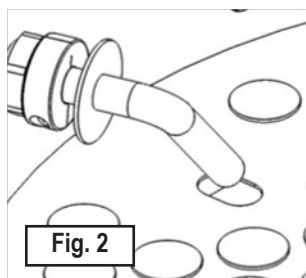
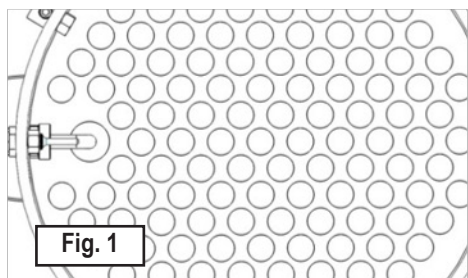
Connect the power cable to the receptacle of the Surface™ and to a power or temperature controller, such as the BrewCommander™ (sold separately).

False Bottom - To install the false bottom, first remove the dip tube. Place the false bottom on the stepped bottom of the kettle with the **“buttons” facing upward** and the support feet down (shown in Fig. 1). Note that the 10-gallon false bottom does not have support feet. Install the large washer onto the dip tube, and then insert the dip tube into the false bottom hole.



(NPT KETTLES ONLY) - To insert the dip tube through the false bottom hole on NPT kettles, place the dip tube in the bulkhead fitting (shown in Fig 2). Position the hole in the false bottom close to the dip tube and rotate the dip tube until it engages the hole. Rotate the false bottom into place (shown in Fig. 3). Push the dip tube into place and slide the washer down to cover the hole (shown in Fig. 4).

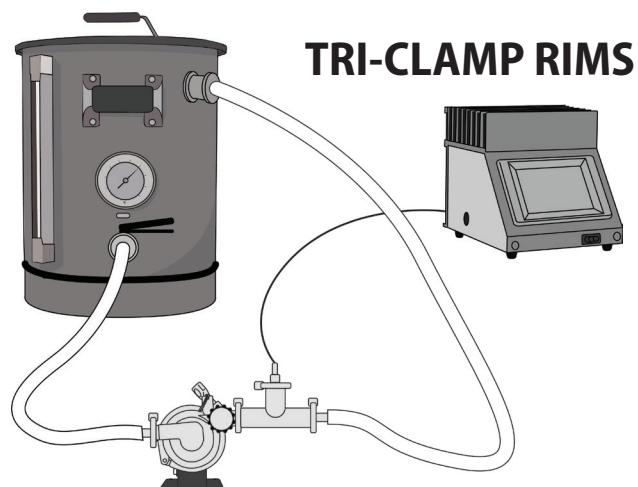
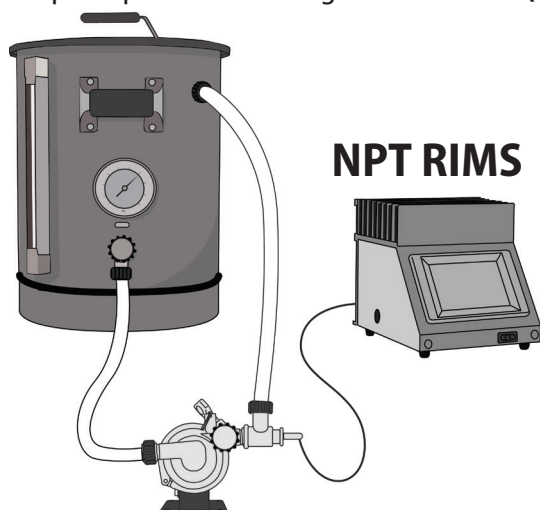
Note: If using a previously purchased 20 gal false bottom ensure the edge sits flush on the ledge of the kettle. If not please contact Blichmann Engineering



AutoSparge™ (optional) – Install the Autosparge in the top port of the kettle. Refer to the Autosparge™ for more detailed setup and operation instructions.

Brewmometer™ (optional) - Install the Brewmometer™ in the wall of the Mash Tun, to observe the mash temperature.

Temperature probe (sold separately) - Install the controller's temperature probe in the path of the flowing wort, NOT in the wall of the Mash Tun. For NPT kettles, we recommend using the Blichmann In-Line Temperature Fitting. For Tri-Clamp kettles, we recommend using a 1.5" Sanitary Tri-Clamp Tee (**BE-000864-00**) and a Blichmann 1.5" Tri-Clamp Adapter for attaching Thermometer" (**BE-001139-00**).



OPERATION

False Bottom – We recommend filling your mash vessel to no more than 75% of gross capacity. This will allow sufficient space for dough-in and sparge arm. The chart at the beginning of the manual includes water to grist ratios (**Page 2**) for reference. The chart also recommends lauter rates to reduce sticking the mash and provide consistency. A typical mash lauter should take 45-60 minutes. Also included in the chart is the max recommended flow rates for RIMS or HERMS systems in the chart. Of course, each RIMS and HERMS system and grist crush will affect flow rate, so you will likely need to experiment with your system.

The button louver false bottom is extremely resistant to plugging, however, most stuck mashes are usually the result of drawing too hard on the mash, causing it to compact and reduce permeability. Or malt that is crushed too finely. Air in the mash, from raking too vigorously, is also a common causes of a stuck mash. Additionally, wheat, flaked barley, and oats are particularly problematic due to lack of husks, higher protein and/or gluten content. Rice hulls are recommended for beers with these ingredients.

Tip: You can use the optional level gauge as an indicator that the mash is beginning to stick. If the wort level in the level gauge drops below half the height of the liquid level in the inside of the kettle, you are drawing too hard and should reduce the flow rate.

Recirculating Infusion Mash System (RIMS) – The Boilermaker Surface can be used for maintaining heat inside the kettle, but heating the wort can only be done during recirculation. Set the BrewCommander to 50% power to reduce the chance of over-heating the element and tripping the built-in thermal protection. Step mashing is very easy with this system! Verify that wort is recirculating during the mash. Take note of the liquid level on the level gauge before starting re-circulation, and reduce flow rate if the level on the gauge begins to fall more than 50% of the initial level. If you have stuck the mash, immediately turn off power to the kettle, close the valve and gently scrape the compacted grains from the bottom of the mash. Allow ten minutes for the air to dissipate from the mash then vorlauf (recirculate) until the wort clears. Then you may begin lautering again at a reduced rate.

CAUTION: Installing the controller probe into the wall of the kettle, rather than in the recirculation loop, will cause over-shooting and unstable mash temperatures, because the mash will react slowly to heating. Refer to the RIMS setup images on page 8.

CAUTION: When doing step mashes (heating the wort with the false bottom in place) it is imperative to circulate the wort while you are heating. The false bottom impedes the natural convection of heat to the mash above the false bottom and traps the majority of it below the false bottom. Failure to recirculate may result in scorching of the wort/ grain and possible permanent heat damage to the kettle. This is NOT a warrantable failure. Use a pump to recirculate during mash. Be sure not to exceed the recommended flow rates for your kettle volume. You will find that the mash temperature indicated on the BrewCommander may overshoot or undershoot a bit during the heat cycle, but the kettle's temperature will remain steady. See the BrewCommander manual for more information.

Tip: Use the RIMS Setup and Operation Tips section of the BrewCommander manual to achieve the most precise control of the Surface in the mash configuration.

VALVE ASSEMBLY AND USE

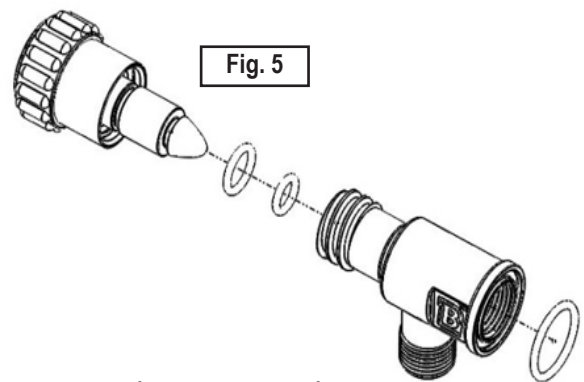
NPT LINEAR FLOW VALVE

Use of the Linear Flow Control Valve- The linear flow control valve comes with a Teflon washer for added rotation functionality. The valve can be rotated by loosening the internal bulkhead fitting while securing the valve with a wrench. Once loosened, rotate the valve to the desired position, and re-tighten. Always ensure linear flow control valve is tightened prior to use. To open the linear flow control valve turn valve knob counterclockwise slowly until desired flow is achieved.

WARNING: STOP turning when you begin to see the threads when draining kettle. Continuing to open the valve will not increase the flow and can result in an unintended release of hot liquid, causing severe burns!

CLEANING THE LINEAR FLOW VALVE

Ensure that the kettle has been fully drained and turn the valve counterclockwise until the threads disengage. A careful pull on the knob will “snap” the shaft into a “detente” position, letting you know that the stem has reached the end of travel in the valve body (**Shown in Fig. 5**). Confirm again that the kettle is empty and pull firmly to remove the stem. To reassemble press stem firmly back into valve body and turn knob clockwise to engage threads and close valve.



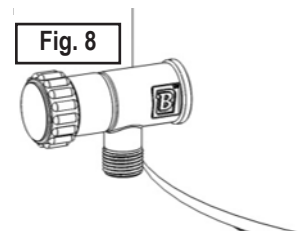
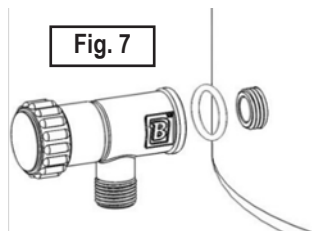
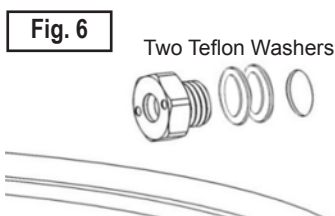
WARNING: Do not disassemble the valve with liquid in the kettle or severe burns can result!

Installation of the Dip Tube

The unique design of the dip tube assembly allows removal/installation without tools. Simply pull the dip tube directly out of the drain fitting for removal. To reinstall, wet the dip tube with water, insert it into the fitting, and rotate it until the pin engages the small hole in the fitting. When properly seated, the tube will “snap” into the O-ring groove and provide an excellent seal. Since the boil kettle is on the hot side of the process, it is not necessary to have these components sanitized before use. Simply having them clean and free of soil is adequate. It is not necessary to remove the fittings or O-rings for cleaning after each use.

If you do want to remove them for periodic cleaning or replacement, O-ring replacement kits are available at blichmannengineering.com. To reinstall the dip tube fitting, use the following sequence to ensure a tight leak free joint:

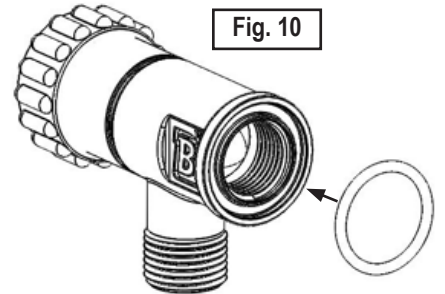
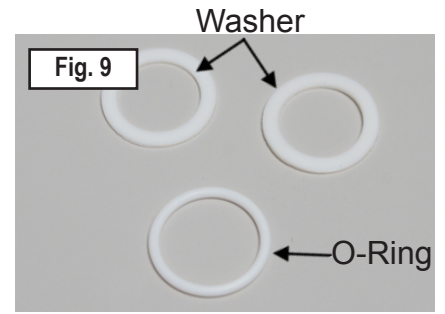
Reinstall the O-ring in the inside of the bulkhead fitting after inspecting for tears or cuts. If any are found, replace the seal. Insert the bulkhead fitting into the kettle as shown in Fig. 6. Then place the large O-ring in the groove on the face of the valve. Turn the bulkhead fitting to thread it into the valve. Take care that the O-ring does not fall out of the groove when tightening. Do not use Teflon tape on this joint. When hand tight, use a wrench on the flats of the valve and a socket and torque wrench on the bulkhead fitting to tighten to 40 ft-lb (54 N-m)(roughly 1/4 turn)(**shown in Fig. 8**).



Optional Rotating Dip Tube:

Your kettle will come with an optional rotating dip tube kit including 2 Teflon washers (Flat) and 1 Teflon O-Ring (Rounded). To install, replace the silicone O-ring with the Teflon O-ring (**Fig.10**). Install both Teflon washers on the inside of the kettle. Once installed your valve and dip tube will be able to rotate.

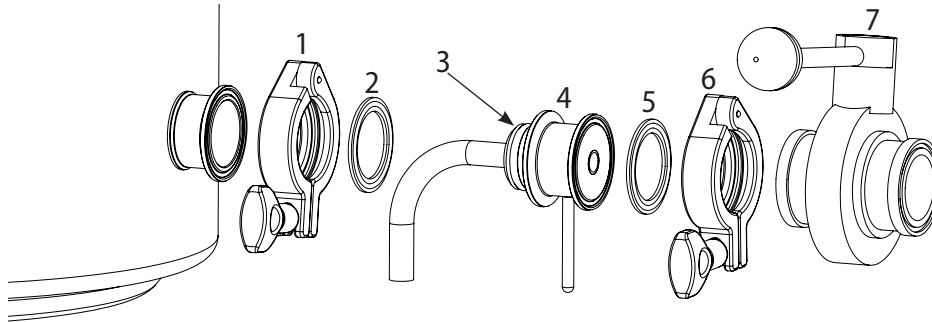
CAUTION: Do not over tighten. Insure the kit seals properly before use.



TRI-CLAMP VALVE ASSEMBLY

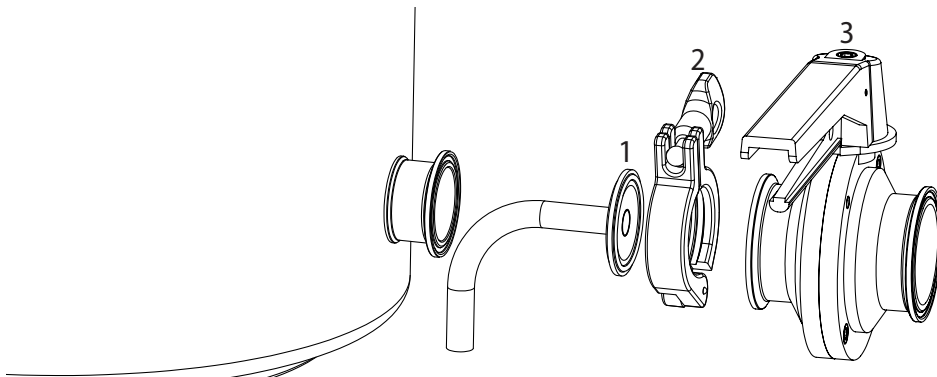
Tri-Clamp Valve Installation

Rotating 1.5" Butterfly Valve - Install the rotating valve as shown below. During operation, loosen tri-clamp and rotate the dip tube to draw from a higher point above any hops or trub.



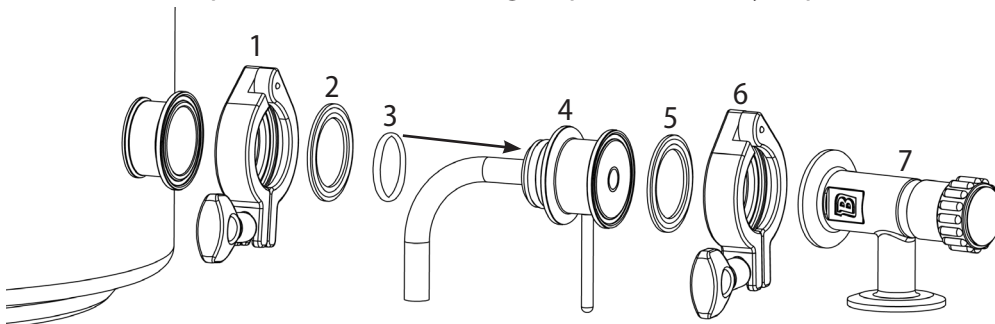
#	Description	Item #
1	1.5" Clamp	BE-000633-00
2	1.5" Gasket	BE-000868-00
3	Dip Tube O-ring	BE-500386-00
4	Rotating Dip Tube	BE-001686-02
5	1.5" Gasket	BE-000868-00
6	1.5" Clamp	BE-000633-00
7	Tri-Clamp Valve	BE-001356-00

Stationary 1.5" Butterfly Valve - Install the dip tube with gasket into your tri-clamp port with the 1.5" butterfly valve and secure with a clamp.



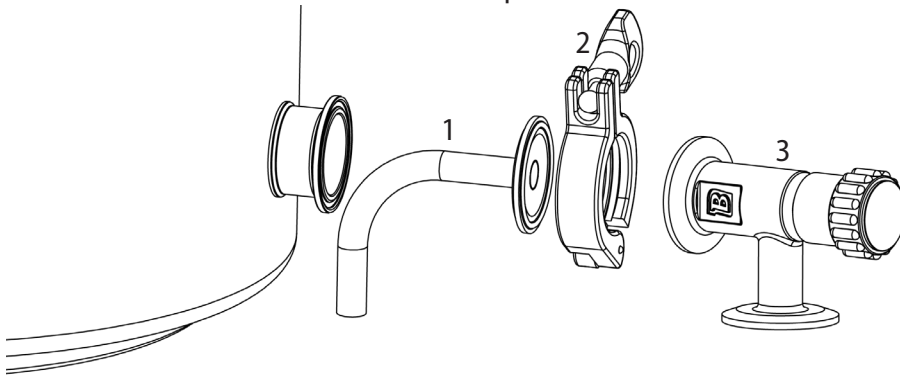
#	Description	Item #
1	Molded Dip Tube	BE-001698-01
2	1.5" Clamp	BE-000633-00
3	Tri-Clamp Valve	BE-001356-00

Rotating 1.5" G2 Linear Flow Valve - Install the rotating valve as shown below. During operation, loosen tri-clamp and rotate the dip tube to draw from a higher point above any hops or trub.



#	Description	Item #
1	1.5" Clamp	BE-000633-00
2	1.5" Gasket	BE-000868-00
3	Dip Tube O-ring	BE-500386-00
4	Rotating Dip Tube	BE-001686-02
5	1.5" Gasket	BE-000868-00
6	1.5" Clamp	BE-000633-00
7	G2 Tri-Clamp Valve	BE-002055-00

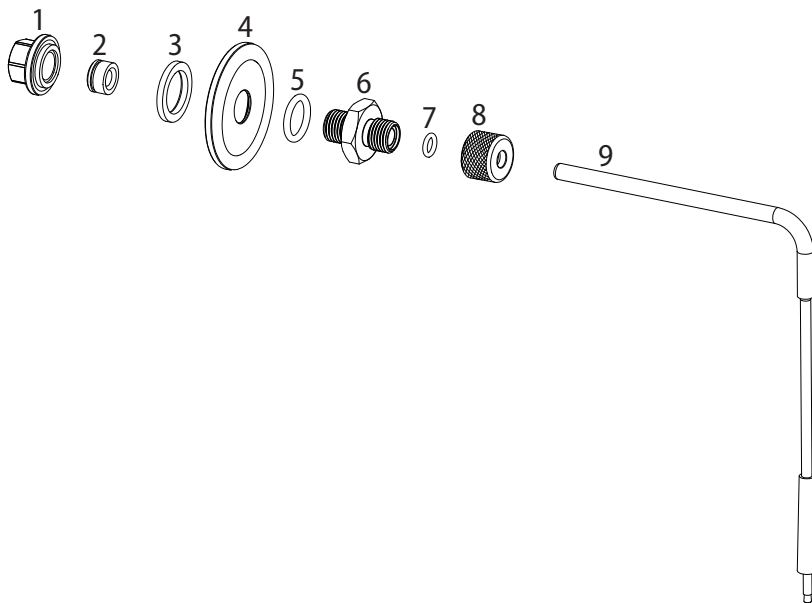
Stationary 1.5" G2 Linear Flow Valve - Install the dip tube with gasket into your tri-clamp port with the 1.5" G2 Linear Flow Valve and secure with a clamp.



#	Description	Item #
1	Molded Dip Tube	BE-001698-01
2	1.5" Clamp	BE-000633-00
3	G2 Tri-Clamp Valve	BE-002055-00

Tri-Clamp BrewCommander™ Temperature Probe Installation

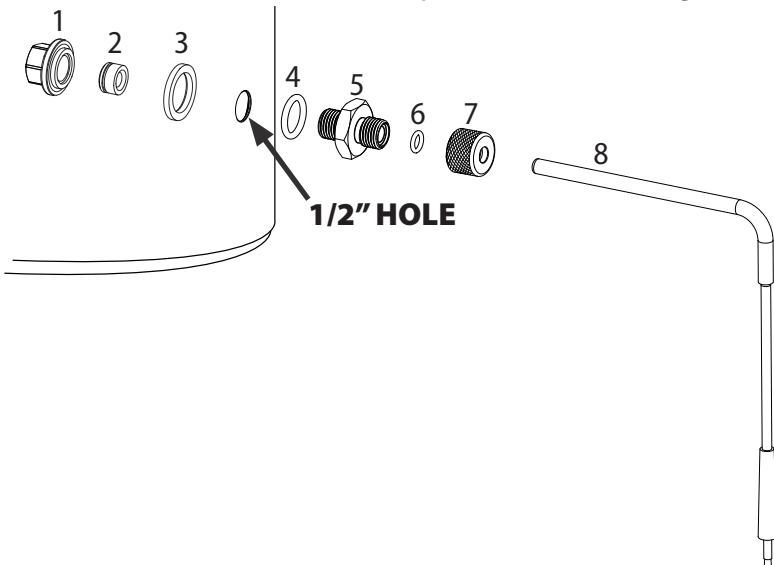
Install the BrewCommander™ Temperature Probe through the tri-clamp cap and secure with the seals and nut.



#	Description	Item #
1	Sanitary Nut	BE-000882-01
2	Sanitary Nut Inner Seal	BE-000882-01
3	Sanitary Seal Outer Seal	BE-000882-01
4	Tri-Clamp Adapter	BE-001139-00
5	Bulkhead O-ring -113	BE-000013-00
6	Weldless Captive Bulkhead	BE-001474-00
7	Captive Nut O-ring	BE-001511-00
8	Captive Nut	BE-001475-00
9	Temperature Sensor Probe	BE-001500-00

NPT BrewCommander™ Temperature Probe Installation

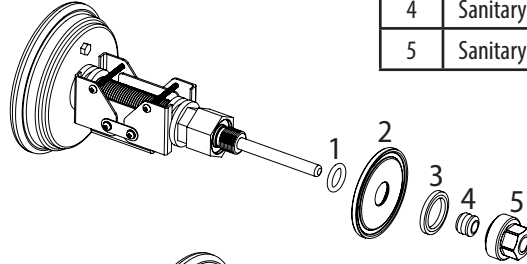
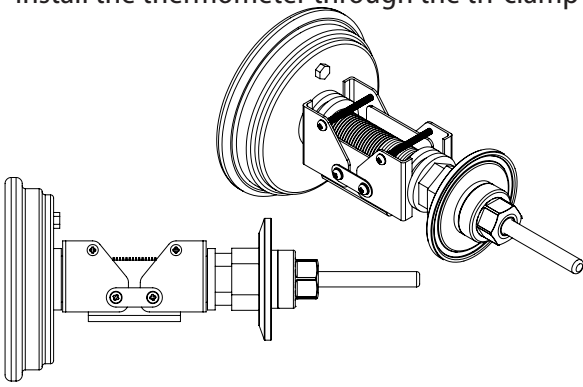
Install the BrewCommander™ Temperature Probe through the kettle and secure with the seals and nut.



#	Description	Item #
1	Sanitary Nut	BE-000882-01
2	Sanitary Nut Inner Seal	BE-000882-01
3	Sanitary Seal Outer Seal	BE-000882-01
4	Bulkhead O-ring -113	BE-000013-00
5	Weldless Captive Bulkhead	BE-001474-00
6	Captive Nut O-ring	BE-001511-00
7	Captive Nut	BE-001475-00
8	Temperature Sensor Probe	BE-001500-00

Tri-Clamp BrewMometer™ Installation

Install the thermometer through the tri-clamp cap and secure with the seals and nut.

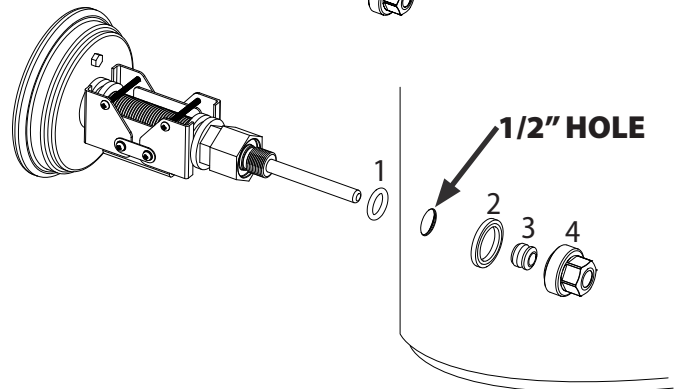


#	Description	Item #
1	O-ring	BE-000207-00
2	Tri-Clamp Adapter	BE-001139-00
3	Sanitary Nut Assembly	BE-000882-01
4	Sanitary Nut Assembly	BE-000882-01
5	Sanitary Nut Assembly	BE-000882-01

NPT BrewMometer™ Installation

Install the thermometer through the kettle and secure with the seals and nut.

#	Description	Item #
1	O-ring	BE-000207-00
2	Sanitary Nut Assembly	BE-000882-01
3	Sanitary Nut Assembly	BE-000882-01
4	Sanitary Nut Assembly	BE-000882-01



USE OF THE LEVEL GAUGE

WARNING: Never remove the clean out screws on the top or bottom of the gauge when the kettle is full. Disregard for this warning can cause severe burns!

CAUTION: The BoilerMaker™ brew kettle uses a thick wall borosilicate glass level gauge tube that will never cloud, scratch or discolor or break from normal use. The heavy gauge guard will protect the glass from accidental breakage, but care must be taken to avoid impacts to the kettle. Broken level gauge glass is not covered under warranty.

Hops, particularly whole hops, can block/plug the opening of the level gauge affecting the ability to read the level accurately. Bagging your whole hops in a muslin grain bag is recommended if this becomes problematic.

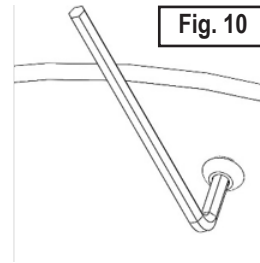
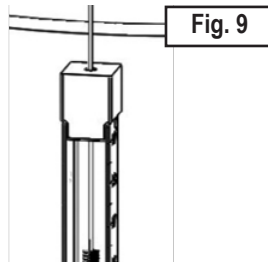
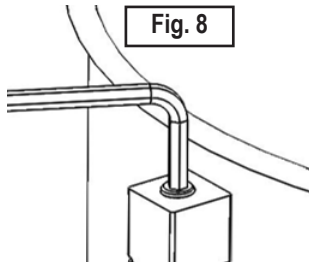
The level gauge is calibrated to reflect the liquid level in the kettle and is accurate to approximately 1qt. For the 10/15/20 gallon BoilerMakers™, and approximately 2qt for the 30/55 gallon BoilerMakers™.

To clean the gauge glass after use, remove the set screw in the top and bottom of the level gauge (**shown in Fig. 8**) using the 1/4" hex wrench provided. Use the included cleaning brush to clean the tube (**shown in Fig. 9**). When reinstalling the set screws, DO NOT over tighten them! When you feel the set screw make contact with the bottom of the fitting a small amount of torque is all that is needed to make the seal. This will prevent premature failure of the threads or damage to the seals.

If you choose to remove and disassemble the gauge from the kettle for periodic cleaning, take care to place the O-rings in the proper locations. Inspect all O-rings for tears or cuts and replace as needed. Repair kits are available at blichmannengineering.com.

Verify the o-ring is present between the kettle and the level gauge end blocks. Reinstall the gauge and tighten the mounting screws by hand. Insert the 5/16" Allen wrench to tighten the nut to 20 ft-lb (27 N-m) (**Shown in Fig. 10**). DO NOT over tighten! A firm pressure is all that is needed to seal the joint. Take care to prevent the end block from rotating, which will crack the glass!

Note: If using metric volumes, remove sight glass gauge and invert, and reinstall for liters scale.



MAINTENANCE

Remove the product from power source before cleaning. Immediately after use clean your kettle with a non-metallic scouring pad such as a green Scotch-Brite pad and mild detergent or powdered brewery wash (PBW). Do not use any cleaners containing bleach which is harmful to stainless steel. In addition, **DO NOT** soak your kettle in cleaners or sanitizers for extended periods (1hr max) to avoid any problems with pitting or galvanic corrosion. Dry thoroughly after cleaning.

DANGER: Surfaces may be hot for several minutes after power is removed. Allow to cool before making contact with the kettle.

DRY-RUN THERMAL BREAKER RESET INSTRUCTIONS

The Surface is equipped with a thermal production device (thermostat) located on the bottom of the heating element inside of the enclosure. The thermostat functions by turning off the power if the maximum temperature is reached. This protects the kettle and element from damage in the event of dry-firing. The element cannot be over-heated in normal brewing operations but may occur if the steady flow of wort stopped during a mash, or if the kettle was energized without any liquid in the kettle.

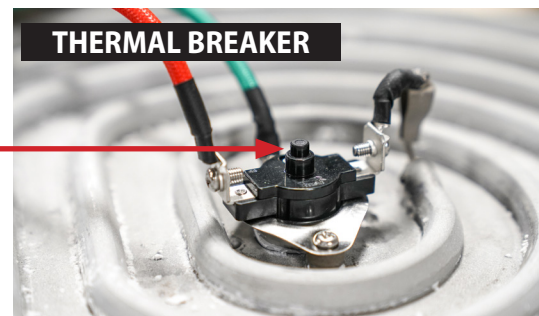
DANGER: Risk of electrocution! Remove product from power source before removing bottom enclosure or resetting dry-run breaker.

A loud click is an audible indicator of the thermal breaker tripping. If the kettle has stopped heating for any reason, and power supply has been confirmed to be operation, set the controller to off, allow the kettle to cool off for 5 minutes and follow the steps below.

Note: The thermal breaker is a back up safety device and should never be used as a standard shut off method.

1. Turn off the power supply and disconnect the kettle from power by removing the power cord from the receptacle on the side of the kettle.
2. Drain the contents of the kettle.
3. Turn the kettle upside down and remove the rubber plug from the center of the enclosure.
4. Use a non-metallic tool (e.g., a plastic body ink pen) to press the round, grey button located on the center of the thermostat inside of the enclosure.
5. A positive click should be detected; the thermostat should be reset.
6. Inspect the interior of the kettle for debris and clean with PBW (powdered brewery wash) or Bar Keeper's Friend if required.
7. Return the kettle to service.

RESET BUTTON



NPT TO TC ADAPTER FOR ACCESSORIES

NPT accessories such as the NPT AutoSparge™ and HERMS Coil are installed through the hole location with the included nut. Once installed, secure the tri-clamp to NPT adapter cap (Part #: aQC-15TCAdapter) (**Figure 11**) to the threads of your accessories.

Figure 11



KETTLE ACCESSORIES

HopBlocker™



aHopBlocker
The HopBlocker™ blocks the hops and trub from getting to your fermenter from your boil kettle.

Whirlpool Kit



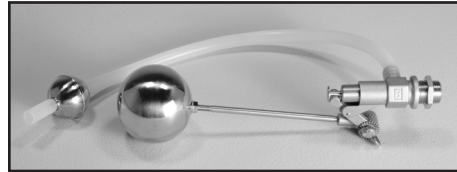
aWhirlpool-G2
The Whirlpool Kit allows you the ease of creating the perfect whirlpool.

HERMS Coil



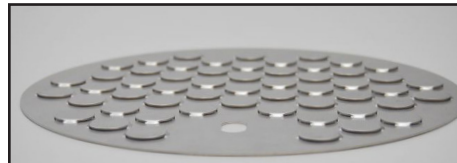
aHERMSCoil
Blichmann's expertly engineered HERMS coil is available in two versatile sizes.

AutoSparge™



AutoSparge
The AutoSparge™ is a set it and forget it sparging system.

False Bottom



aFalseBottom
The patented button louvered false bottom creates the perfect mash filter.

Sight Glass



aSightGlass
Standard heavy-duty borosilicate glass level gauge never clouds or scratches. Features rugged stainless steel guard with engraved volume graduations in gallon and liter, cleaning brush, and clean-out ports. Much easier and more accurate than internal graduations.

Whirlpool Kit



aWhirlpool-Molded-TC
Includes our overmolded whirlpool arm making cleaning a breeze.

Tri-Clamp AutoSparge



aTC-Autosparge
Do you long for a sparging system with a "set-it-and-forget-it" design? The elegantly simple construction of the AutoSparge™ level and flow control system lets it automatically set the hot liquor flow rate and liquid level and adjust to compensate for a constant level in your mash tun.

Rotating Dip Tube



aRotating-Diptube-TC
Tool-free rotating dip tube helps clarify wort.

Stationary Dip Tube



BE-001698-01
Tool-free stationary dip tube.

Blichmann Engineering™ Product Warranty

A. Lifetime Warranty

1. Blichmann Engineering provides a lifetime warranty to the original purchaser that this product will be free from manufacturing defects in material and workmanship. This is limited to the kettle construction and any welded fittings on the kettle. It also includes the element, bonding of the element to the kettle, thermal breaker, and electrical wiring components that they will be free from manufacturing defects in material and workmanship.
2. This product is for home use only. The limited warranty covers only those defects that arise as a result of normal use of the product and does not cover any other problems, including, but not limited to, those that arise as a result of:
 - a. Improper maintenance or modification;
 - b. Damage due to incorrect voltage or improper wiring by customer;
 - c. Operation outside of the product's specifications;
 - d. Carelessness or neglect to operate the product in accordance with instructions provided with the product;
 - e. Damaging the tamper label on the product;
 - f. Damage by over-tightening the fasteners;
 - g. Failure to follow cleaning and / or maintenance procedures; or
 - h. Exceeding published operational temperatures.
3. Blichmann Engineering reserves the right to request delivery of the defective component for inspection before processing the warranty claim. If Blichmann Engineering receives, during the applicable warranty period, notice of a defect in any component that is covered by the warranty, Blichmann Engineering shall either repair or replace the defective component with a new or rebuilt component at Blichmann Engineering's option.
4. Blichmann Engineering must be notified within seven (7) days of the delivery date of any shipping damage. Customer is responsible for shipping damage outside of this time period. Approval for return must be provided by Blichmann Engineering prior to any return. Customer is responsible for keeping all original packaging material for warranty returns. Blichmann Engineering is not responsible for damage from improperly packaged warranty returns, and these repair costs will be the sole responsibility of the customer. Shipping costs for warranty returns are covered only for the contiguous United States.
5. Blichmann Engineering's limited warranty is valid in any country where the product is distributed.

B. Limitations of Warranty

1. Any implied warranty that is found to arise by way of state or federal law, including any implied warranty of merchantability or any implied warranty of fitness, is limited in duration to the terms of this limited warranty and is limited in 1 scope of coverage to this warranty. Blichmann Engineering disclaims any express or implied warranty, including any implied warranty of fitness for a particular purpose or merchantability, on items excluded from coverage as set forth in this limited warranty.
2. Blichmann Engineering makes no warranty of any nature beyond that contained in this limited warranty. No one has authority to enlarge, amend, or modify this limited warranty, and Blichmann Engineering does not authorize anyone to create any other obligation for it regarding this product.
3. Blichmann Engineering is not responsible for any representation, promise, or warranty made by any independent dealer or other person beyond what is expressly stated in this limited warranty. Any selling or servicing dealer is not Blichmann Engineering's agent, but an independent entity.

C. Limitations of Liability

1. The remedies provided in this warranty are the customer's sole and exclusive remedies.
2. Except for the obligations specifically set forth in this warranty, in no event shall Blichmann Engineering be liable for direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory and whether or not advised of the possibility of such damages.
3. This warranty does not cover, and in no event shall Blichmann Engineering be liable for, travel, lodging, or any other expense incurred due to manufacturing defects in material and workmanship, or any other reason.
4. Any performance of repairs after the warranty coverage period has expired or performance of repairs regarding anything excluded from coverage after this limited warranty shall be considered good-will repairs and they will not alter the terms of this limited warranty, or extend any warranty coverage period.
5. Venue for any legal proceedings relating to or arising out of this warranty shall be in Tippecanoe County, Indiana, United States, which courts will have exclusive jurisdiction.

D. Local Law

1. This warranty gives the customer specific legal rights. The customer may also have other rights that vary from state to state in the United States or other countries.
2. To the extent that this warranty is inconsistent with local law, it shall be deemed modified, only to the extent necessary to be consistent with such local law.

This product uses FDA and/or NSF approved food grade materials anywhere the product touches the beverage.

Warning: This product contains or may contain chemical(s) known to the State of California to cause cancer, birth defects, or other reproductive harm.