



Cornical™

Modular Keg & Conical Fermentor

Operation, Assembly & Maintenance Manual

Congratulations on your purchase, and thank you for selecting the Cornical™ Modular Keg and/or Conical Fermentor from Blichmann Engineering. We are confident that it will provide you years of service and many gallons of outstanding beer. This manual will familiarize you with the assembly, installation procedures, and use of this product.

**** PLEASE READ THOROUGHLY PRIOR TO USE FOR IMPORTANT SAFETY INFORMATION ****

IMPORTANT !!

Danger: Sections labeled "Danger" are critical to follow and understand to reduce risk of serious injury or death. Please read these thoroughly and understand them completely before use. If you do not understand them or have any questions, contact your retailer or Blichmann Engineering (www.BlichmannEngineering.com) before use. Do NOT at ANY time operate the product until you have thoroughly read and understood these instructions!

Warning: Sections labeled "Warning" can lead to serious injury if not followed. Please read these thoroughly and understand them completely before use. If you do not understand them or have 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.

Overview:

The Cornical™ modular keg and conical fermentor is an amazing innovation that work in conjunction allowing the product to perform all the functions of a conical fermentor, and at the same time convert quickly into a dispensing keg after fermentation is complete. The modular keg and conical fermentation kit are sold as a kit or separately so the brewer can utilize a single fermentation kit with multiple kegs saving money and adding versatility. Simply ferment, invert the Cornical™ when fermentation is complete, exchange the cone bottom for the keg bottom and you're ready to dispense! No racking to a second vessel needed. The large opening on the bottom of the keg makes cleaning and sanitizing simple and fast.

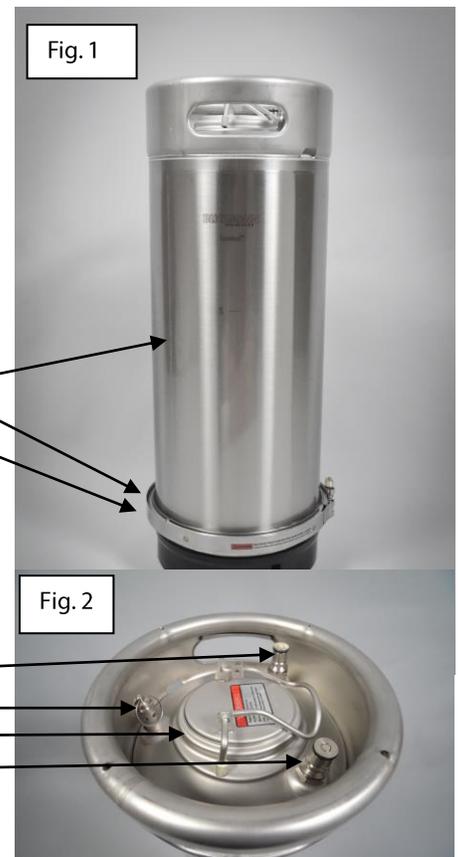
Assembly:

This manual covers both the keg (aCornical-Keg), and the conical fermentation kit (aCornical-Fermentation-Kit.)

Parts List:

The keg assembly is pre-assembled and includes the following:

Item	Description	Qty	Part Number
1	Keg body	1	BE-000543-01
2	Lid hatch	1	BE-000797-00
3	CO2 in post	1	BE-000804-00
4	Beer out post	1	BE-000803-00
5	Pressure relief valve assembly	1	BE-001101-00
6	Liquid out tube	1	BE-000801-00
7	Gas in tube	1	BE-000814-00
8	V-band clamp	1	BE-000546-01
9	Clamp nut	1	BE-000799-02
10	Body o-ring	1	BE-000548-00



The conical fermentor kit is partially assembled and includes the following:

Item	Description	Qty	Part Number
1	Cone	1	BE-000547-03
2	Leg (installed on cone)	3	BE-000939-01
3	Acorn nut (installed on cone)	6	BE-000028-00
4	Leg cap (installed on legs)	3	BE-001022-00
5	Tri-clamp butterfly valve (1.5 in)	1	BE-000865-00
6	Sampling valve	1	BE-000954-00
7	Racking fitting	1	FE-367-01
8	Racking tube	1	FE-357-00
9	Racking tube nut	1	FE-376-03
10	Racking o-ring	1	BE-000682-00
11	Clamp - 1.5"	3	BE-000633-00
12	Gasket 1.5"	3	BE-000868-00

13	Cap – 1.5"	1	BE-000630-00
14	Elbow – 1.5"	1	BE-000863-00
15	Barb fitting – 1.5" TC X 1" hose	1	BE-000627-00
16	Clamp ¾"	1	BE-000634-00
17	Gasket – ¾"	1	BE-000949-00
18	QuickConnector nut	1	QC-12NUT-01
19	QuickConnector cap	1	BE-001017-00
20	QuickConnector ½" elbow	1	QC-12ELBOW-01
21	QuickConnector o-ring	1	BE-000105-00
22	Hose – ½" blowoff	1	BE-000707-00
23	Hose clamp	1	BE-000374-00
24	Fermentation lid hatch	1	BE-000944-01
25	Airlock	1	BE-500019-00
26	Airlock washer	1	BE-001018-00
27	1" ID bottom dump hose	1	BE-001100-00

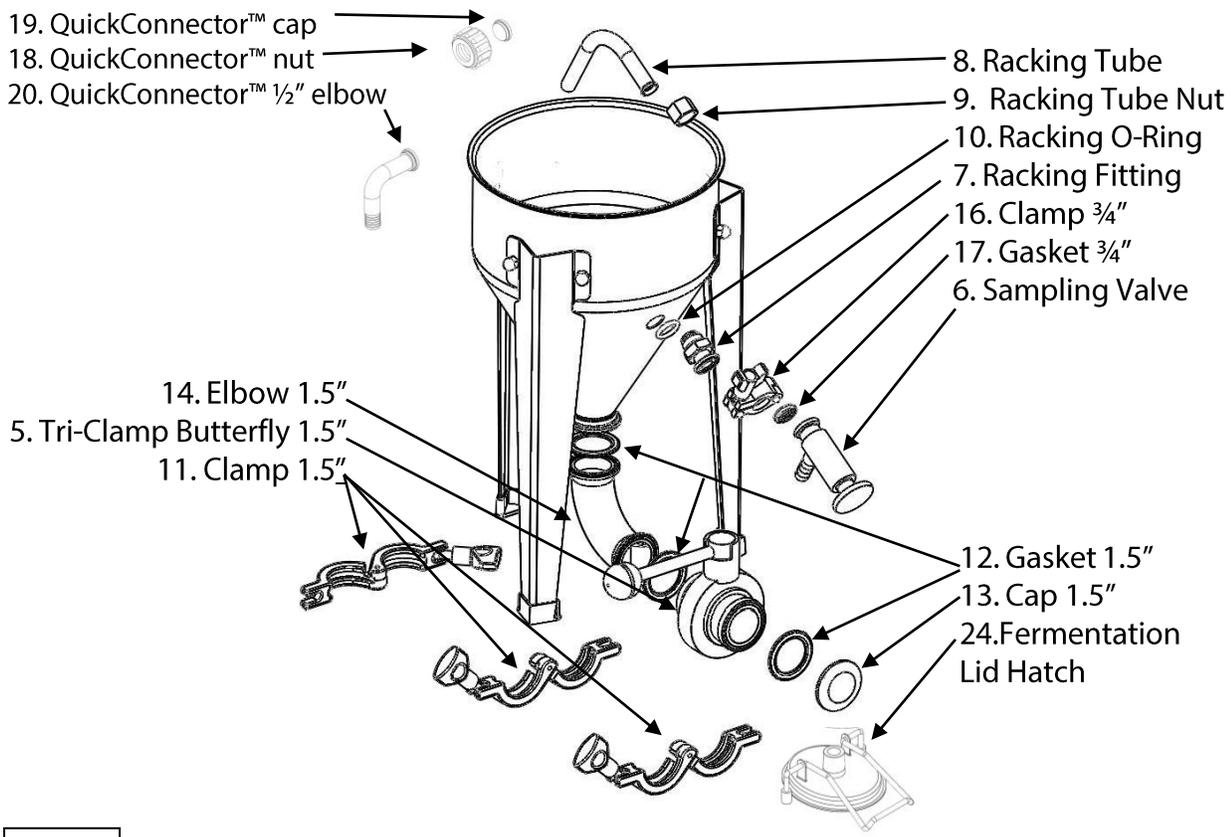


Fig. 3

Assembly of the Keg Kit:

Note: We recommend a trial assembly of your new Cornical™ keg before using it to ferment so you are familiar with the procedures and are sure you have all the parts. When you are ready to use the fermentor for an actual brewing session, read the sanitizing procedures before assembling your Cornical™ since many parts are sanitized before assembly.



Fig.4

DANGER: ALWAYS release the pressure inside of the keg before attempting to open the keg or loosening the nut on the v-band clamp! If this clamp is opened while under pressure serious injury or death may result! Relieve pressure by pulling the ring on the top of the pressure relief valve until the hiss of gas completely stops (Fig 4.) Remove the hatch on top of the keg to ensure all pressure is released (Fig. 5)! At this time it is safe to remove the v-band clamp from the bottom of the keg (Fig. 6.)



Fig. 5

DANGER: ALWAYS remove the lid hatch on top of the keg BEFORE removing the v-band clamp on the bottom of the keg! This ensures that the keg is fully depressurized.

DANGER: NEVER exceed the 50 PSI (3.3 BAR) rated pressure!

DANGER: Only use the pressure relief valve that is included with this product. Do not modify or tamper with the relief valve. Using the incorrect parts or tampering with the pressure relief valve can lead to serious injury or death!

DANGER: DO NOT use any pressure relief valve components or the lid hatch on any keg other than the Cornical™ or serious injury or death could result!



Fig. 6

DANGER: ALWAYS use a blowoff hose or airlock during fermentation. Do NOT use the solid lid or cap the NPT fitting on the fermentation lid while the beer is actively fermenting.

Cleaning & Sanitizing the Keg:

DANGER – DEPRESSURIZE KEG BEFORE OPENING OR REMOVING CLAMP: Before opening or removing the v-band clamp ALWAYS first relieve ALL internal pressure from the keg by pulling the ring on top of the pressure relief valve until all hissing stops (Fig. 4.) Then remove the lid hatch on top of the keg (Fig. 5.) Continue to fully disassemble the keg including the removal of the keg posts and pressure relief valve (PRV). It is not necessary to disassemble the posts or PRV further.

Soak all parts in a suitable cleaning agent such as PBW (powdered brewery wash) or similar cleaner. Scour the inside of the keg body and the keg bottom. It is important that ALL parts are free of soil for the sanitizer to work properly. Rinse all components in hot water and allow to dry thoroughly so that the passive layer forms on the surface of the stainless steel.

Prepare a 3-4 gal bucket of sanitizer. We recommend StarSan from Five Star products. However, any non-chlorine based no-rinse sanitizer including Iodophor are acceptable. Soak all fittings in the sanitizer before assembly. Recommended, but not included, is a long brush for cleaning the inside of the liquid out tube. These are available at your retailer.

Caution: Iodophor CAN be harmful to stainless steel if exposed for long periods of time. Never store a keg with iodophor inside. Do not use any cleaner or sanitizer containing chlorine such as bleach. Over time, this will pit and erode stainless steel. This is not a warrantable failure.

Caution: Do not soak the V-band clamp or brass nut in sanitizer. Doing so reduces the life of the threads and may cause galling (sticking) of the threads. Clean only with warm soapy water if needed. Always place a dab of Vaseline or keg lube on the threads of the v-band clamp each time before assembly. This helps to increase the life of the threads and makes assembly easier. Galled, cross-threaded, or other thread damage from failure to use lube or soaking in sanitizer is not a warrantable failure.

Place the o-ring on the bottom lip of the keg body as shown in Fig. 7. Place the keg bottom onto the bottom of the keg body making sure the o-ring is not pinched, then place a dab of Vaseline or keg lube on the threads of the clamp and then install the band clamp finger tight. Using a 7/16" wrench (not included) tighten the clamp fully. When fully tightened, the clamp gap (shown in Fig. 8) will be a maximum of 3/16".

DANGER: ALWAYS ensure that the clamp is fully tightened! Failure to do so can result in serious injury or death!

Next, reinstall the tubes, keg posts, and the pressure relief valve. Pour the 3-4 gal of sanitizer from the bucket into the keg through the keg hatch opening. Reinstall the keg hatch. Slowly apply 5-10 PSI of pressure to the keg to check for leaks near the clamp and other fittings. If you see any leaking, depressurize the keg, remove the lid, and disassemble the clamp checking for a pinched seal and also inspect other components for leaks or missing seals.

Note: Contact the factory at support@blichmannengineering.com if you have any trouble getting a seal.

After 5-10 min, invert the keg to sanitize the top portion of the keg. After another 5-10 minutes depressurize the keg, remove the hatch on top of the keg, and pour out the sanitizer.

TIP - Purge oxygen from your keg: If you are storing your keg and want it ready to fill at a future date purging it with CO₂ and storing under 10-15 PSI of pressure is highly recommended. Place the keg in an inverted position to let the sanitizer drain fully. Then return the keg upright and replace the lid hatch. Connect a black LIQUID ball lock on your CO₂ hose. Connect it to the liquid out post. This purges the keg from the bottom up. Pull the pressure relief valve, and turn it 90 degrees so that it stays in the open position. Turn on your CO₂ gas



and let the gas run for about 30 seconds to one minute. Then return the pressure relief valve to the closed position. When the CO₂ gas stops flowing the keg will be under pressure. Turn off the gas and remove the ball lock from the post. If you are immediately filling your keg it is not necessary to pressurize it after purging.

Filling the Keg:

Depressurize your keg and remove the lid hatch on top. Place a sanitized hose on the outlet of your fermentor and place the other end at the BOTTOM of the keg. This will minimize foaming, splashing, and oxidizing your beer. When the keg is full, remove the hose and install the lid hatch. Pressurize the keg through the gas post to about 10-15 PSI. Pull the pressure relief valve to vent the pressure and allow it to re-pressurize. Do this 4 or 5 times to purge any oxygen out of the head space of the keg. Refrigerate the keg and apply CO₂ pressure as needed for proper carbonation. In most cases, the beer will fully carbonate in 7-10 days. We do not recommend shaking the keg, exceeding the normal dispensing pressure. Doing so usually results in over-carbonated beer.

TIP: If you are in a hurry to drink your beer, Blichmann Engineering offers our QuickCarb™ in-line carbonator that will carbonate your beer in about an hour with no chance of over-carbonation.

Fermentation Kit Assembly and Use:

The fermentation kit is an optional accessory for the Cornical™ modular keg. This kit converts your keg into a full featured conical fermentor. This allows you to eliminate the transfer of the beer to a secondary keg for dispensing. Simply invert the fermentor after fermentation is complete, replace the cone with the keg bottom, and you're ready to carbonate and dispense!

Note: It is to be expected that there will be some krausen residue on the inside of the keg body after fermentation. For full flavored ales and lagers this will not lead to detectable off flavors. However, for delicately flavored beers, or extended lagering and cellaring times, it is recommended to transfer the fully fermented beer into a second clean keg.

Fully disassemble the fermentation kit components and soak in a cleaning agent similar to the procedure used for cleaning and sanitizing your keg. Note that it is not necessary or recommended that you disassemble the large butterfly valve. However, it is recommended that you remove the stem from the racking valve.

After soaking in a cleaning agent, rinse with hot water and then soak in a bucket of 4-5 gal of sanitizing solution.

Assemble the bottom dump assembly and racking assembly as shown in Fig. 3. Use a wrench on the inside and outside of the racking arm and tighten firmly.

Note: Do not use Teflon sealing tape on the threads of the racking arm. Ensure that the o-ring is on the outside of the tank and is placed in the groove of the racking arm fitting.

TIP: It is recommended that you orient the racking tube and the racking valve outlet tube in the same direction. This will act as a position indicator of the racking tube as you begin draining the fermentor. Install the conical bottom on the keg body using the identical procedure as installing the keg bottom above. Place the fermentor upright and fill the fermentor with about 4-5 gal of sanitizer. Replace the keg lid hatch with the fermentation lid hatch (Fig. 9) and install the nut, cap, and o-ring. Pressurize to 5-10 PSI and check for any leaks. Let soak for 5-10 minutes. Invert the keg and let sit another 5-10 minutes. Place the fermentor

upright, release the pressure, remove the lid hatch and drain the sanitizer back into the bucket. Open the drain valves to expel any remaining sanitizer.



Filling the fermentor: Fill the fermentor through the top lid hatch to a maximum of 5.75 gal for beer (6 gal for wine) to ensure there is adequate head space to prevent a blow-off of krausen. Reinstall the fermentation lid hatch and install either the included airlock or the blowoff hose.

Included with your fermentor is an airlock and silicone washer that can be used during fermentation (Fig 9.1.) In addition, a ½" 90 degree elbow and ½" hose are also provided to act as a blowoff kit for aggressive fermentations (Fig. 10.)



TIP: It is highly recommended that you use Fermcap S in the fermentor which significantly reduces krausen and potential for blow-off. This product also aids in improving head retention in the finished beer. Fermcap S is available through your retailer.

Warning for Dry-hopping: Do not use loose whole leaf hops for dry-hopping! Not only will they possibly clog the pressure relief valve causing a potential dangerous over-pressurization, the leaves tend to clog the racking arm. If you use whole hops be sure to use a hop bag. Pellet hops can be used with or without a hop bag. In all cases, using a hop bag will reduce the carry-over of hop particles in the finished beer and harvested yeast and leave you with more finished beer. Boiling the bag before placing the hops inside is an easy way to reduce the risk of introducing bacteria in to the fermentor from the bag. In practice, pre-boiling of the hops is not needed due to the natural bacterial inhabitation from hops. This will also preserve the volatile aromatic compounds from being lost.



TIP: Proper aeration of your wort is essential for proper yeast health. An inline oxygenation system is available through Blichmann Engineering. ANVIL Brewing Equipment™ also offers a high quality oxygenation wand.

Harvesting yeast: If you're harvesting the yeast for use in a future batch of beer, you'll need to sanitize the included 1" hose and the 1" hose barb fitting first. The inside of the valve can easily be sanitized by a spray bottle of sanitizer a few minutes prior to installing the barbed fitting. Slowly open the dump valve and allow the brown colored trub to pass first and drain into a pan. Close the valve and direct the 1" hose into a sanitized container. Collect the cream colored yeast and then close the valve and spray the valve with sanitizer. A wide mouthed Erlenmeyer flask fitted with an airlock and stopper is ideal yeast collection vessel for this application. Purging the flask with CO₂ before filling is ideal. With proper sanitization techniques, yeast can be stored for about 2 weeks and harvested 4-6 times in a homebrew environment. Since you'll have plenty of yeast to pitch (reactivate with a small amount of wort if more than one week old) you'll find your ferments starting faster and progressing much more quickly and completely.

Rotating Racking Arm Operation



This feature is used for taking wort samples during the fermentation process and for racking the finished beer into secondary vessels, kegs or a bottling bucket. If you are planning on leaving the beer in the fermentor and switch to the keg bottom, skip to the next section: Converting to Keg.

Tip: Open the pressure relief valve prior to draining beer/wort from the tank or you will suck the liquid out of the airlock and into the fermentor! The CO₂ from the actively fermenting beer is generally sufficient to purge any ingested air from the tank. However, if you place a few PSI or pressure on the keg prior to taking a sample there will be no additional air drawn into the tank. To do this, remove the airlock and install the plug in its place.

Wort sample: Taking a wort sample is as easy as turning the knob on the back of the racking valve and draining it directly into a container (Fig. 11.) After taking a sample, spray sanitizer into the outlet of the racking valve. Note that it isn't necessary to rotate the valve to take a sample.



Racking finished beer – gravity drain: Spray the barb fitting inside and out with sanitizer. Connect the sanitized ½" sanitized hose and clamp to the barb fitting. Hold the valve body to prevent it from rotating, and slowly open the valve, begin draining it into your keg or bottling bucket. Then slowly rotate the racking arm assembly downward as in Fig. 12 . Stop rotating when you see a yeast pick-up, then turn it back a bit to keep from picking up additional yeast. DO NOT loosen the tri-clamp fittings to turn the racking arm and pay close attention that the hex on the rack fitting is rotation with the

valve assembly. If it is not, either tighten the assembly or turn the assembly by the hex using a wrench. That's it! If you never see a yeast pick-up, leave it in the full down position.

Converting to Keg

This is one of the most useful features of the Cornical™ features. The ability to invert the fermentor and switch from the conical bottom to the keg bottom. This completely eliminates the need to clean or rack into a secondary vessel for dispensing!

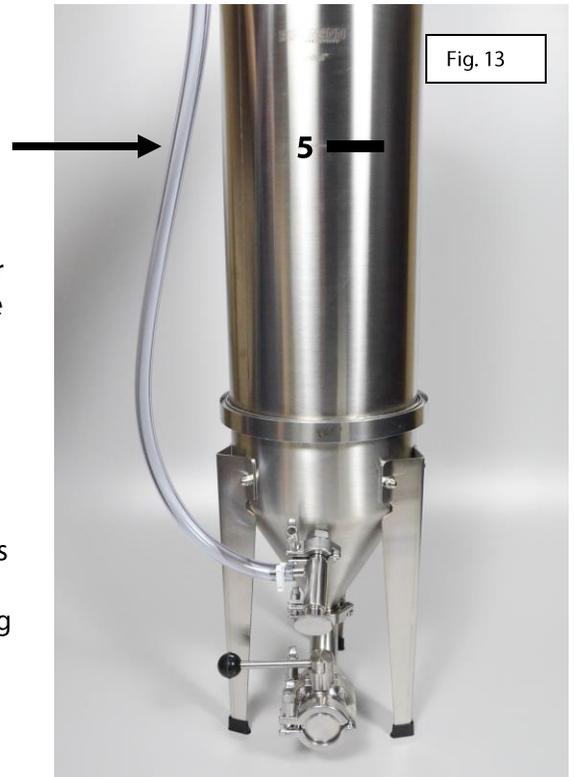
Use a hydrometer and check that the specific gravity of the beer has not changed for a period of 3 days to ensure that fermentation is complete.

Prior to inverting the keg it is important to drain as much yeast and trub as possible from the fermentor so that it isn't left in the finished beer. Remove the cap from the bottom dump valve. Connect the 1" barb fitting and hose to the bottom dump valve. Open the valve slowly and drain the thick yeast and trub into a pan. Stop when liquid runs from the hose. Remove the barb and hose, spray the inside of the valve with sanitizer and reinstall the cap. Wait a couple days for more yeast to settle and repeat.

TIP: If the yeast has compacted and will not flow from the valve, close the valve. Install the cap on the lid hatch and pressurize the fermentor to about 5-10 PSI with CO₂. Then SLOWLY open the valve and the yeast should begin to flow.

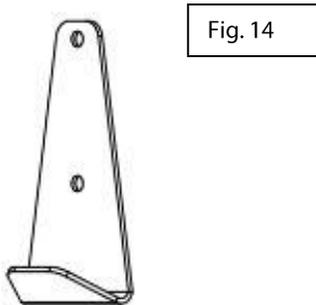
After ensuring all of the yeast sediment has been expelled from your fermentor, you will need to measure the beer level in the fermentor to ensure it is less than 5 gal so that it doesn't spill when you remove the cone bottom. To do this connect the sanitized 1/2" hose to the outlet of the racking arm with a clamp. Depressurize the fermentor by pulling the pressure relief valve and lock it open. Then hold the open end of the hose above the top of the fermentor and slowly open the racking valve. The beer level will equalize at the level inside of the tank. See Fig. 13. If the beer level is above the 5 gal mark simply drain some beer from the racking valve hose. Then close both the racking and pressure relief valve and remove the hose.

Install the keg plain lid hatch as shown in Fig. 5. Pull the pressure relief valve to relieve any pressure and then invert the keg. Remove the conical bottom and replace it with the keg bottom as per the previous instructions. Reinvert the keg, connect a CO₂ fitting on the gas in post and purge the air from the top of the keg as described previously. Pressurize the keg for carbonation and check for leaks at the band clamp, keg posts, and the lid hatch area. Correct as needed. That's it!!



Accessories

Optional wall hanger (BE-000933-01) is available and sold separately.



Blichmann Engineering Product Warranty

A. Limited Warranty

1. Blichmann Engineering warrants to the original purchaser that this product will be free from manufacturing defects in material and workmanship for a period of one (1) year from the date of purchase by the customer. Proof of purchase is required. Blichmann Engineering's obligation to repair or replace defective materials or workmanship is the sole obligation of Blichmann Engineering under this limited warranty.
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 warrantee 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 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.