

PICOSTILL INSTRUCTION MANUAL

Congratulations!

You're about to take your beverage making to the next level. Our craft beer brewing appliances not only help you produce the perfect pint--with the PicoStill accessory, they're also about to help you make your distilling dreams come true. Use the PicoStill to distill hops, citrus, and other botanicals, and if your distilling license is in working order, spirits, too!

IMPORTANT LEGAL INFORMATION

PicoBrew, Inc. does not advocate the violation of any federal or state law, rule, or regulation. All the products we sell, including the PicoStill, are intended to be used in accordance with the proper licensing or permitting procedure of the respective jurisdiction of the user. By your purchase of our products generally, and the PicoStill in particular, you expressly acknowledge and agree that you understand that your purchase and use of a PicoStill is subject to these laws, rules, and regulations, and that you will fully comply.

We also advise you that, as a manufacturer of distilling equipment, we are obligated under federal law to maintain a record of where we ship each unit that we manufacture. The federal government may demand that we produce these records at any time; and should we be ordered to do so, we will be obligated to identify the name and address of each purchaser, including you, who has received a shipment that includes a PicoStill. The federal government may thus become aware of your purchase and use of equipment that is capable of distilling spirits, regardless whether you use it for that purpose or not.

You should also know that in the United States both federal and state laws govern the procurement and use of equipment capable of distilling spirits, like the PicoStill, and that you are obligated to comply with both. State laws may be as or more stringent than federal law, but not less so, and in some cases may even prohibit the purchase of distilling equipment regardless of intended use.

Under federal law, stills are legal to own for purposes of distilling water and essential oils. It is otherwise illegal under federal law for individuals to produce alcohol for consumption without first obtaining a federal distilled spirits plant (DSP) permit. The DSP is available only for commercial operators. Federal law does not provide any exemption for the production of distilled spirits for personal or family use.

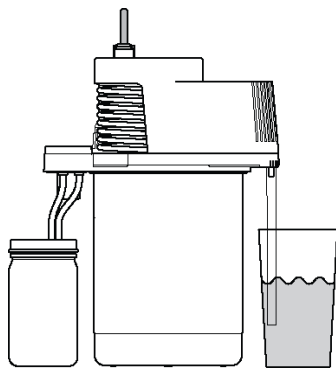
We offer the foregoing as general guidance about certain laws that may apply to you and your use of a PicoStill. We do so with the understanding that this is for your informational purposes only; that we are not warranting its completeness or accuracy; that applicable laws may change with or without notice; and that you can and ultimately should consult a legal advisor who has knowledge about the laws that currently apply in your specific jurisdiction.

IMPORTANT SAFETY INFORMATION

ALWAYS operate in a room with adequate ventilation. This still is designed to prevent dangerous quantities of flammable vapors from escaping, if used properly.

PicoStill is designed to work in an indoor environment with an ambient temperature below 80 °F (27°C). Since PicoStill operates at low condensation temperatures, performance may be hindered at warmer temperatures.

To minimize the risk of highly flammable vapors escaping from the exhaust port, the PicoStill will automatically shut down if the temperature near the bottom of the condenser exceeds 95F. Additionally, it is recommended that the user attach a tube to the exit port, allowing the gasses to bubble through water, as shown in the picture.



Do not expose PicoStill upper unit to water! Electronic circuits are under the cover. Gently wipe exterior with a damp cloth to clean, do not use any solvents.

Do not operate PicoStill in presence of open flame or other heat sources when distilling alcohols. Vapor ejection port can emit potentially flammable vapors.

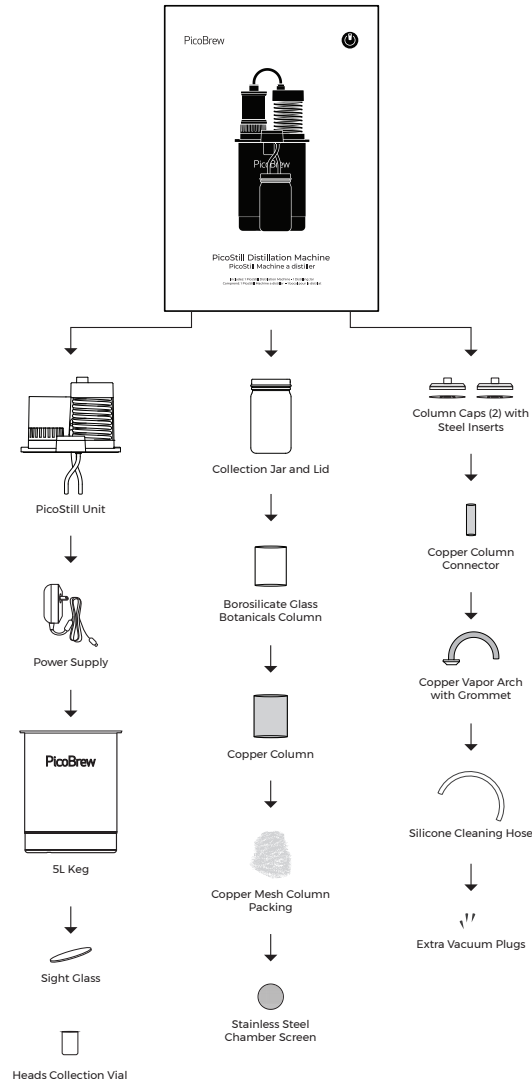
Do not allow collection jar to fill to more than 90% capacity. Liquids can be drawn into the vacuum pump, significantly shortening its life and potentially voiding warranty.

Do not brew beer with the gray racking connector installed. Pressure can build up in the Pico keg and potentially cause damage.

PicoStill is designed to only distill water and ethanol-containing washes. Do not attempt to distill with solvents or any other hydrocarbons including propane, butane, or hexane. Spirits distillation instructions pertain only to licensed distillers and those who live in regions where alcohol distillation is legal. Use at your own risk. Alcohol distillation can produce potentially poisonous compounds such as methanol, acetone, etc. Ethanol can be poisonous if ingested in sufficient quantities.

WHAT'S IN THE BOX

- PicoStill Unit
- Power supply
- 5L keg
- Sight glass
- Heads collection vial
- Collection jar and lid
- Borosilicate glass botanicals column
- Copper column
- Copper mesh column packing
- Stainless steel chamber screen
- Column caps (2) with steel inserts
- Copper column connector
- Copper vapor arch
- Silicone vapor arch grommet
- Silicone cleaning hose
- Extra vacuum plugs
- Silicone Collection Jar Hoses (2)



SETTING UP YOUR PICOSTILL

Connecting PicoStill to Wi-Fi

1. Power on your Pico C, connect it to your Wi-Fi network (see Pico C manual for details). You Pico C will update itself with the latest firmware. Important: make sure that you use your equipment in an area with a strong Wi-Fi signal.
2. Power on your PicoStill and wait for the green and yellow LEDs to illuminate and stay on.
3. From the main menu on the Pico C, select 'Utilities' and then Pico Still.
4. Follow the on-screen prompts to set up manual distillation.

If you encounter problems connecting your PicoStill, you may see an error state on the PicoStill LEDs. Below is a list of possible connectivity errors:

| LED Pattern | What It Means |
|------------------------------------|----------------------------------|
| Steady red light + 1 yellow blink | SSID not found |
| Steady red light + 2 yellow blinks | Invalid Wi-Fi credentials |
| Steady red light + 3 yellow blinks | Connection attempt has timed out |
| Steady red light + 4 yellow blinks | No internet detected |

CLEANING YOUR PICOSTILL

Cleaning Solutions

As a cleaning solution, you can use either:

- White vinegar
- Or
- 1 TBSP (~15g) of food grade citric acid added to 1 gallon of water

Important: We recommend using only distilled, filtered or reverse osmosis (RO) water to clean and rinse everything throughout the instructions below. Hard water can leave behind mineral scale, which could solubilize during a distillation run and infuse off-flavors.

Before First Use

Wash the 5 Liter keg, Borosilicate Glass Botanicals Column, Copper Column, Stainless Steel Chamber Screen, Sight Glass, Column Caps and connectors in your cleaning solution to remove any manufacturing oils or residues.

Important: Soak all copper components in cleaning solution for approximately 10 minutes. Also do this after each use to avoid contaminating distillates with impurities such as copper sulfate, a potentially toxic substance, and to avoid creating off-flavors in your extracts or distillates.

Important: Avoid dishwashing soaps, as many leave a detergent film behind, which can taint your distillates. Rinse all parts thoroughly after cleaning.

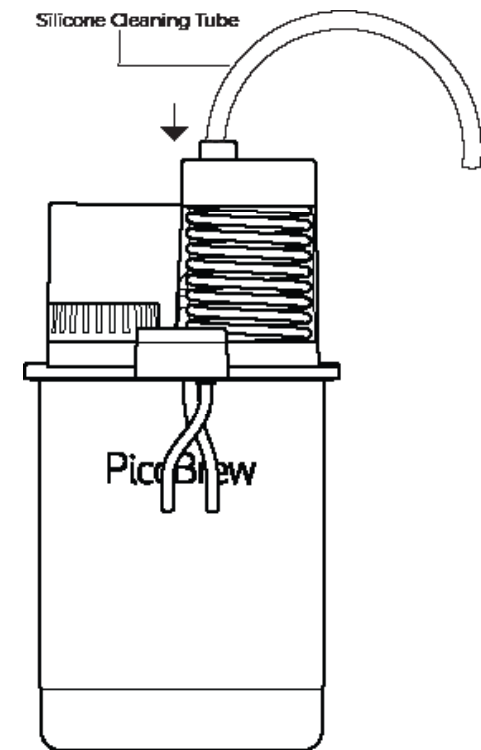
After Distilling

We recommend that you clean the Condenser Column and all removable parts after each use of your PicoStill.

1

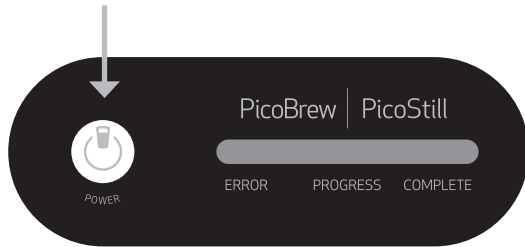
Cleaning the Condenser Column:

Ensure your Heads Trap and Collection Jar are assembled, and the Collection Jar is Empty. Insert the Silicone Cleaning Tube into the silicone seal at the top of the Condensation Coil. Place the other end of the Silicone Cleaning Tube into the cleaning solution.



2

Hold down the PicoStill's button for 5 seconds. The green indicator light will begin to flash. While the green light is flashing, press the button twice quickly to start the PicoStill's vacuum pump. This will pull cleaning solution through the Condensation Coil into the Collection Jar. The pump will shut off automatically after 20 seconds. Repeat this process three times (3x 20 second cleaning cycles).



Note: Do not allow collection jar to fill to more than 90% capacity.

3

Rinse the Condensation Coil by running the vacuum pump a final time with the cleaning hose submerged in distilled or RO water.



4

Dispose of the cleaning solution down the drain or use it to soak other copper parts.



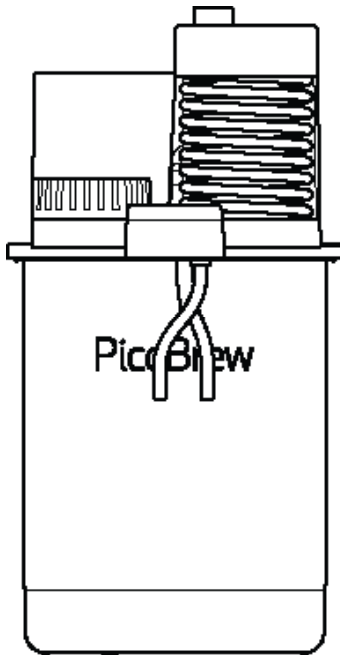
5

Remove and clean the Heads Collection Vial and Sight Glass, then air dry all parts.

1

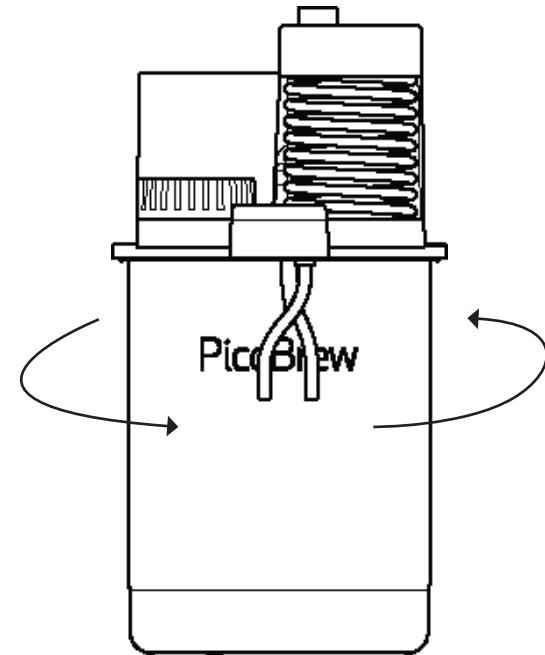
Cleaning the Heating Coil

Fill the keg with 2 Liters of cleaning solution and place the PicoStill on the keg.



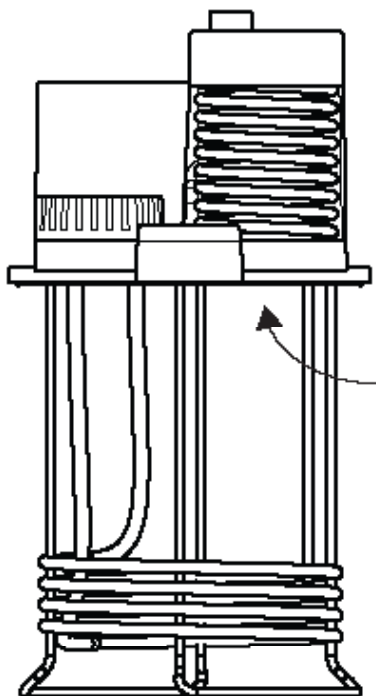
2

Gently swirl the solution in the keg and then allow the Heating Coil to rest in the solution for 15 minutes.



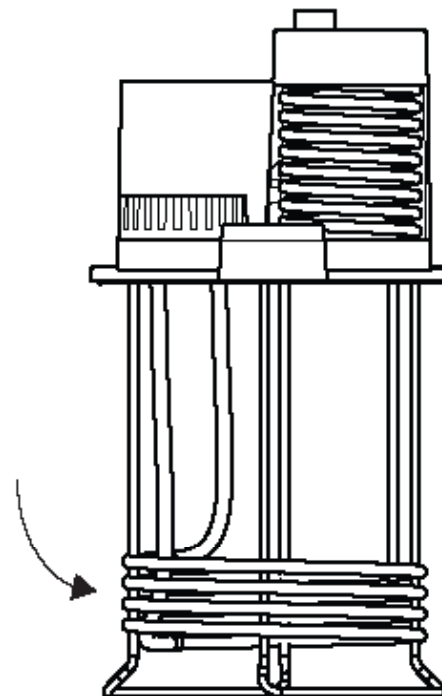
3

Remove the PicoStill from the keg and wipe down the underside of the lid with a damp cloth.



4

Being careful to keep the top of the PicoStill dry, rinse the Heating Coil thoroughly with water and then allow to air dry.





ASSEMBLING YOUR PICOSTILL

Important: NEVER operate PicoStill without the Steel Inserts installed in the Column Caps. Caps can collapse under vacuum, potentially breaking glass components.

UNBOXING

SETUP

CLEANING

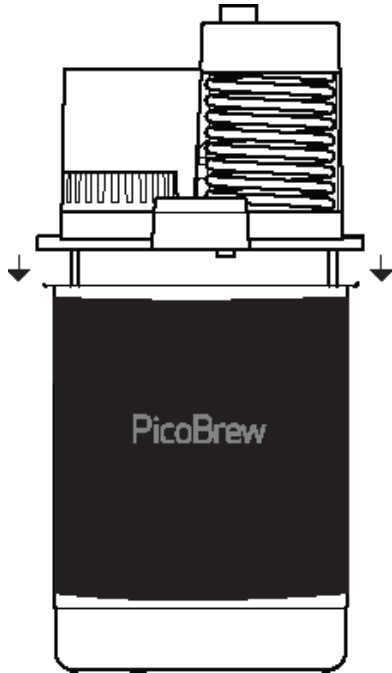
ASSEMBLING

ESSENTIAL OILS

TROUBLESHOOTING

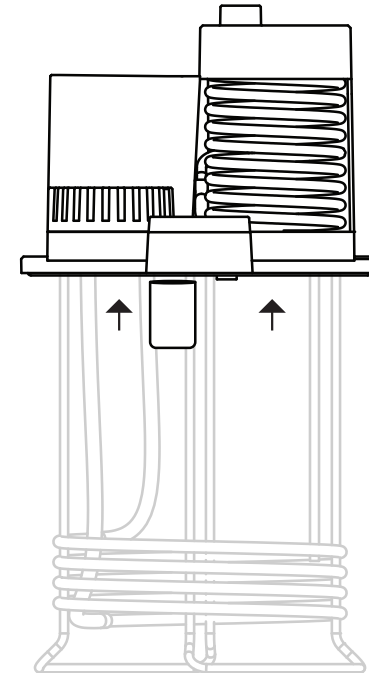
1

Place the Keg Cozy on the 5L Brew Keg and then set the PicoStill unit on top of the Brew Keg.



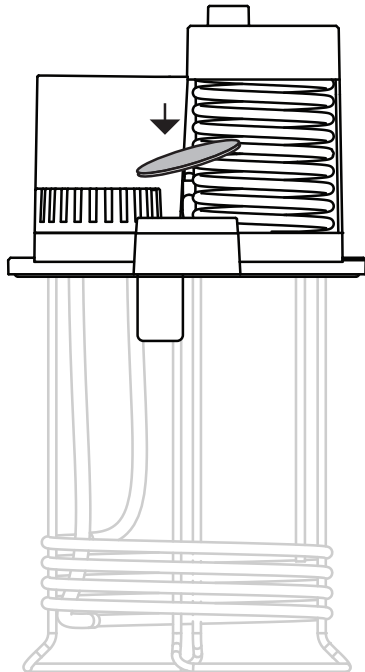
2

Insert the Heads Collection Vial beneath the Heads Trap, making sure that it is firmly seated.



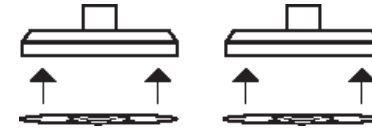
3

Insert the Sight Glass securely under the silicone lip of the Heads Trap.



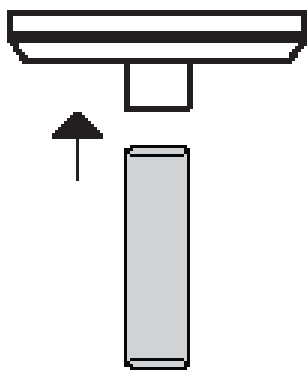
4

Seat the steel inserts into the Column Caps, making sure that the silicone indexing tabs pass all the way through the insert and that the steel insert lays flat against the inside of the Column Cap.



5

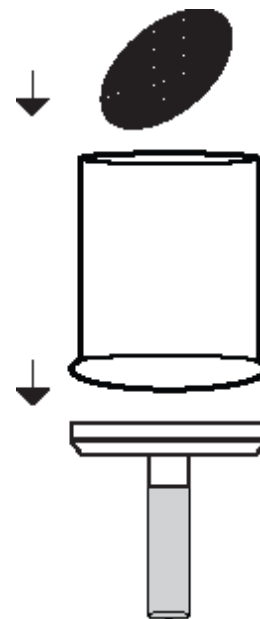
Insert the Copper Column Connector into one of the Column Caps. This will form the bottom Column Cap.



6A

For steam extractions and distillations with the Glass Botanicals Column.

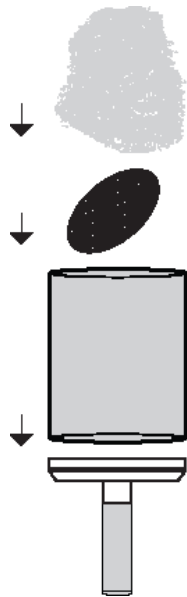
With the lipped end oriented downward, attach the Glass Botanicals Column to the bottom Column Cap. Then, place the Stainless Steel Chamber Screen into the bottom of the column. The Chamber Screen should sit flat on the bottom of the column.



6B

For distillations with the Copper Column.

1. Attach the Copper Column to the bottom Column Cap.
2. Place the Stainless Steel Chamber Screen so that it lays flat on the bottom of the column.
3. Loosely roll the Copper Mesh lengthwise (to fit the height of the column), slightly smaller than the inner diameter of the Copper Column, and then insert the mesh into the Copper Column.

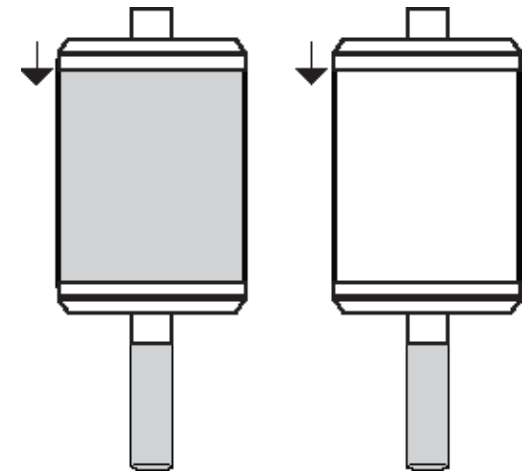


PicoBrew



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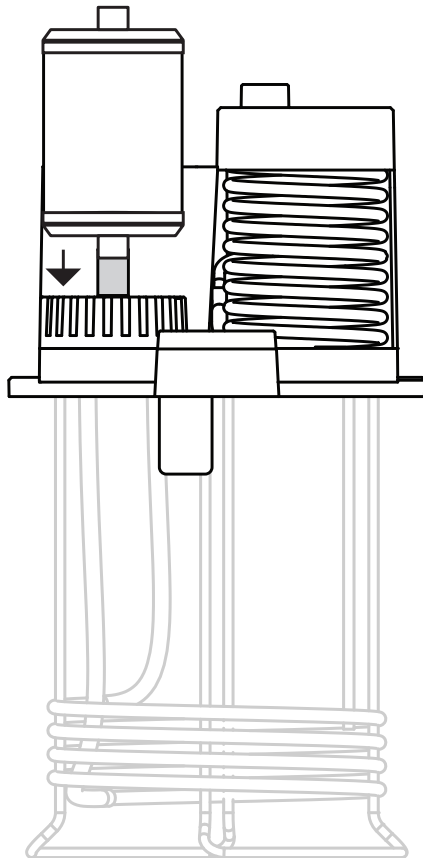
Securely seat the upper Column Cap over the top of the column. Make sure that the Copper Mesh packing does not interfere with the sealing surface.



8

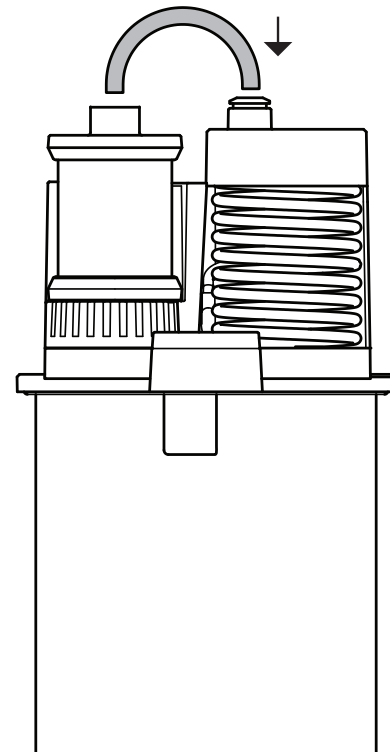
Insert completed column into the PicoStill unit by inserting the Copper Column Connector at the bottom of the column into the hole at the top of the PicoStill as shown.

Note: Even a small wisp of copper wire or a botanical stem caught in the seal will prevent full vacuum operation.



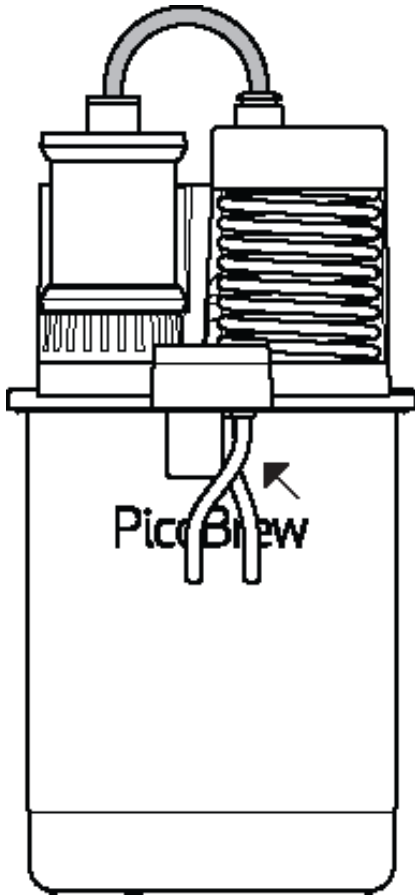
9

Attach the Vapor Arch Grommet to one end of the Vapor Arch and then insert that end into the top of the column. Attach the other end of the Vapor Arch to the top of the Condenser Column. Be sure to insert the Vapor Arch firmly to ensure a good seal.



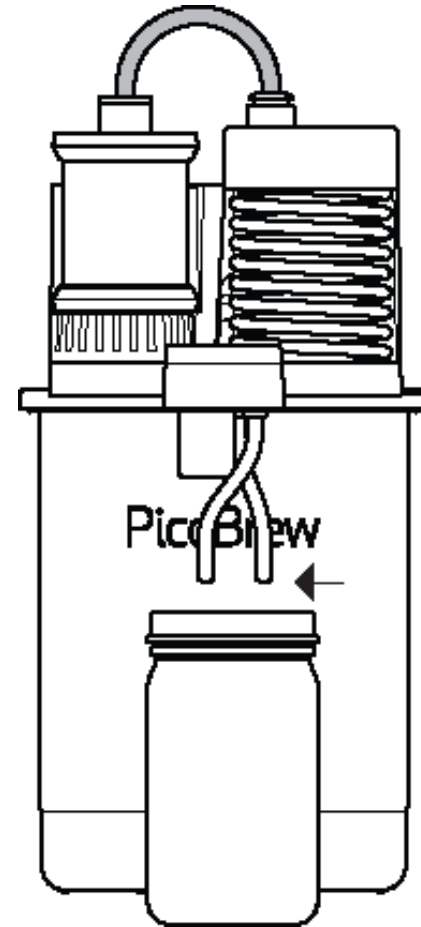
10

Attach the two silicone hoses to the underside of the Heads Trap.



11

Screw the lid onto the Collection Jar and then insert the two hose ends into the lid.





EXTRACTING ESSENTIAL OILS

Introduction

PicoStill creates superior botanical extracts such as hop oil, culinary herbs and spices, and aromatherapeutics. Since PicoStill operates in a vacuum environment, much less heat is required to bring water to a boil and create steam. Less energy means a more delicate extraction.

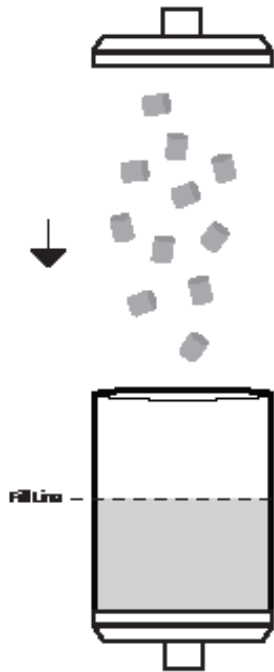
Hop oil extracts can be added directly to your Pico brewed beer after fermentation to give your beer more hops 'punch', similar to dry hopping, without adding excess grassy flavors.

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1

Preparing Hops for Extraction

Fill the botanicals chamber to a maximum of $\frac{1}{2}$ full—do not overpack. Pack botanicals loosely enough so steam can freely pass through the material.



2

(Optional) Place hops in the assembled chamber and set chamber upright on top of a small glass.

Slowly pour vodka over hops, allowing excess to drain into the glass.

Repour the vodka until all of it is absorbed into the hops pellets. If you use too much vodka the hops may break down into a sludge, making it difficult for steam to pass through. If this happens, stir them up with a spoon to loosen them a bit.

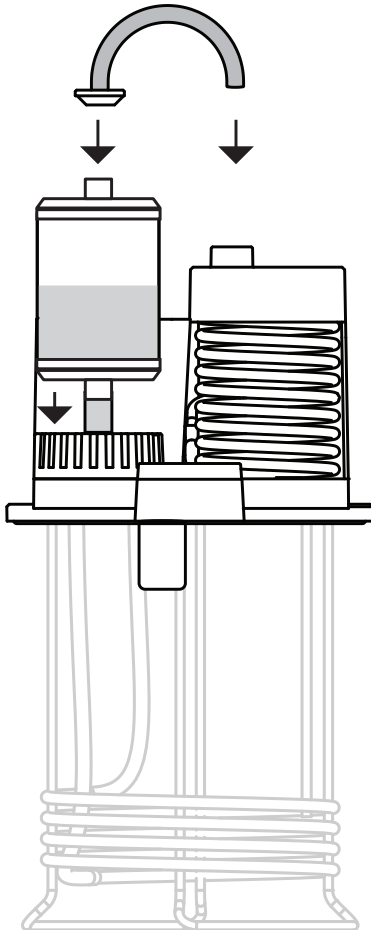
Mike's Pro tip: Wetting hop pellets in vodka or other high-proof grain-neutral spirit will help extract more oils but may give a different flavor and aroma profile. About 1 ounce of vodka per ounce of hops yields the best aromatics. Use $\frac{1}{2}$ to $1\frac{1}{2}$ ounces (max) of hop pellets. Whole leaf or plug hops also give good, but less intense, results.

Important: NEVER use isopropyl (rubbing) alcohol or other non-ingestible co-solvents!



3

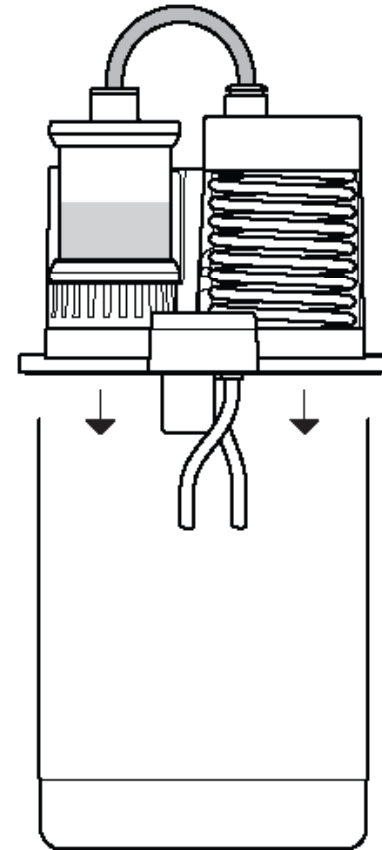
Install upper Column Cap and Copper Vapor Arm and insert the column into PicoStill.



4

Fill the keg with 3-4 liters of filtered, distilled, or RO water and place PicoStill on top of keg.

Milo's Pro Tip: Fill the Heads Collection Vial with water so the oil-containing condensate will drip directly into the jar.



5

Add two inches of water to your Pico's Step Filter, replace the Step Filter Lid, and then insert the Step Filter into the Pico.



6

Connect the IN and OUT hoses of your Pico to their corresponding ports on the PicoStill.

7

Remove the Water Reservoir lid from the top of the Pico. Look inside and check to make sure the black rubber Drain Plug is secured inside the reservoir drain located in the center of the back of the reservoir. Fill the reservoir with approximately 3.5 liters of distilled or reverse osmosis water. Replace the Water Reservoir lid.



8

Power on your PicoStill, then wait for the three indicator lights to stop flashing. You should then see a solid green light.

Note: If this is the first time you've set your PicoStill, you will see solid yellow AND green indicator lights instead of a solid green light. Please allow extra time for Pico to connect your PicoStill to your network.

9

From the Pico main menu select **Utilities**, then select **PicoStill**, then select **Manual Mode**.

Use the Control Knob on the Pico to set temperature to 145-150 degrees and wait for water to boil.

Set the temperature on your Pico about 8 degrees Fahrenheit (4.4 degrees Celcius) *higher* than your desired boiling target.

When working with pure water, you should see the boiling point and extraction begin according to the values in the table below:

| Pressure (PSI) | T3 Temp (F) | T3 Temp (C) |
|----------------|-------------|-------------|
| 2.5 | 128 | 53.3 |
| 2.75 | 132 | 55.5 |
| 3.0 | 135.4 | 57.4 |
| 3.25 | 138.6 | 59.2 |
| 3.5 | 141.7 | 60.9 |
| 3.75 | 144.6 | 62.5 |
| 4.0 | 147.3 | 64 |

Note: The pressure sensor (P) reading should be 4 psi or less if operating normally. When starting the PicoStill, allow 5-7 minutes for adequate vacuum to be created.

10

After boiling is achieved, the temperature setting can be used to control the rate of extraction.

Note: Increasing the temperature will increase the rate of extraction, but may also decrease extraction efficiency.



11

On the Pico screen, monitor the T1 sensor reading (this measures the temperature at the top of the Condenser Column). Extraction will be evident when T1 rises above 95-100 degrees Fahrenheit.

A T1 reading of 105-120 degree Fahrenheit represents an optimal extraction temperature.

If the T2 reading rises above 84 degrees Fahrenheit, decrease the temperature on Pico until the temperature falls below this threshold.

You can also temper the conditions by placing a paper towel wetted with cold water on the condenser coil to increase convection and bring the T2 temperature down.

Important: DO NOT remove the Vacuum Plug or Collection Jar Hoses during operation of the PicoStill. Doing so can cause wet hops or other material to get drawn into the Condenser and risk clogging it.



12

Let PicoStill run until 100-200 ml of condensate have been collected.

Once you have collected an adequate amount of distillate, clean your PicoStill according to the instructions in the **Cleaning Your PicoStill** section of this manual.

TROUBLE-SHOOTING

1. Factory reset PicoStill

1. Unplug your PicoStill.
2. Press and hold down the Power button.
3. With power button held down, plug PicoStill back in. All LED lights should flash once before turning off for about 4 seconds, then the green and yellow lights should turn on and stay on.
4. Release the power button.

After completing the steps above, your PicoStill should be ready to pair with your Pico.

2. PicoStill not holding pressure

During normal operation, the vacuum pump on your PicoStill should hold internal pressure at 4 PSI or below. It may take 5-7 minutes for PicoStill to drop internal pressure to this level. If internal pressure does not drop below this level after this period, then there may be a pressure leak somewhere in the system.

To avoid pressure leaks, ensure that your PicoStill is completely assembled and that all components are seated correctly. Refer to assembly instructions on p.23 of this manual.

Pressure leak testing procedure

You can test for pressure leaks by following the procedure below. If at any point during this procedure, no pressure drop is detected, then a pressure leak is likely.

1. One at a time, pinch the hoses at points 1-3 in *Figure 1* verifying that PicoStill's internal pressure drops at each point. Release each hose before moving on to the next point in the system.
2. Check points 4-6 in *Figure 1* to make sure all components are seated correctly. In particular, ensure that the Heads Trap Vial (point 5) is inserted all the way into the Heads Trap.
3. Remove the Copper Vapor Arch and plug point 7 in *Figure 1* to verify that pressure drops. Replace the Copper Vapor Arch once pressure drop is detected.

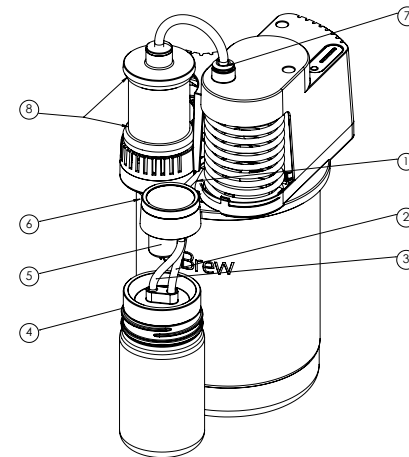


Figure 1

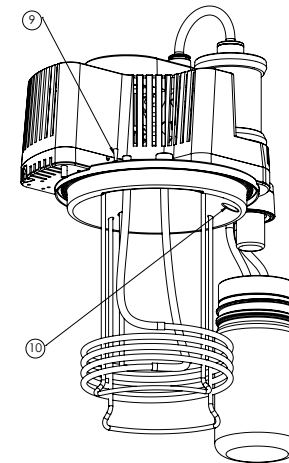


Figure 2

4. Ensure that the column is properly assembled and seated at point 8 in *Figure 1*. If you are using copper mesh inside the column, make sure that no mesh strands are interfering with the seal at the top or bottom of the column.
5. Ensure that the Vacuum Plug is fully inserted at point 9 in *Figure 2*.
6. Lift the PicoStill slightly out of the keg, plug point 10 in *Figure 2*, and check for a pressure drop.

The vacuum pump operates very close to point 1 in *Figure 1*. If you are moving along the testing points described above and PicoStill pulls a good vacuum at one point, but does not pull a good vacuum at the next point, then the vacuum leak is between the two points. Examine for causes of the leak and contact our customer service team at info@picobrew.com.



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