PENGUIN CHILLERS

GLYCOL CHILLER

Owners Manual

WWW.PENGUINCHILLERS.COM

PENGUIN CHILLERS

WE . KNOW . COLD.

Urgent Notice

When first receiving the chiller AND anytime the chiller is moved without keeping the unit level, you MUST let the chiller remain upright for at least 2 hours before plugging it in.

Failure to do so will result in chiller damage.

R32

THE LOW GWP ALTERNATIVE TO R410A

R32 refrigerant has a 68% lower GWP (Global Warming Potential) than R410. While neither refrigerant deteriorates the Ozone layer like R22 did, there is a clear winner when looking at potential to contribute to global warming via greenhouse gases. R32 is a much more environmentally friendly alternative to R410 and we expect to see it become the new environmentally friendly standard in the years to come.

THE LOW GWP ALTERNATIVE TO R410A

R32 is technically classified as a "mildly flammable" gas by the EPA. However R32 is extremely difficult to ignite, non-explosive, and the least toxic of all the Class A refrigerants. The regulatory warning labels on Penguin Chillers are EPA mandated for all refrigerants considered flammable which covers a wide range of refrigerants including mildly flammable refrigerants like R32 as well as highly flammable gasses such as butane (R600) and propane (R290). When it comes to label requirements there is no distinction made between mildly flammable and highly flammable. These regulatory warnings can be a bit intimidating, they are there to keep you informed, but they should not lead you to worry about the use of our chillers in normal operation. Our Chillers are intended for indoor use.

This information is based on reports prepared by the Air-conditioning and Refrigeration Equipment Manufacturers Association of Australia (AREMA) and the Consumer Electronics Supplier Association (CESA)

GLYCOL CHILLER SETUP

Locating the Chiller

Chillers work on the principal of moving heat from one spot to another. In the case of a glycol chiller, its job is to move heat from the glycol out into the air. This means proper air flow is critical to the operation of a chiller. If the chiller is located in an overly hot or unventilated area, it cannot dissipate the heat efficiently therefore lowering the chiller's ability to cool. Unless properly modified, enclosed spaces like small cabinets or closets will heat up quickly and won't provide enough ventilation for the chiller to properly do its job. If the chiller's hot exhausted air is being recirculated back into its intake grills, then the chillers BTU/hr capacity is greatly reduced. It is recommended to have at least 6” of open space on the sides and top of the chiller and at least 12” of open space behind the chiller to allow for proper ventilation.

Power

Our standard glycol chillers (excluding our commercial line) have a GFI plug. Depending on the model, it's suitable to plug into a 110v - 120v 15a outlet (standard household outlet) OR a 208v - 240v 20a outlet (Nema 5-20R). Most of our models plug into standard 15a outlets. It is recommended to plug directly into a receptacle. Power strips should be avoided. If an extension cord is necessary we recommend using a 12 awg cord with single end (not a multi tap). Once plugged in, be sure the GFI is in the reset position and has a green light.

Mixing Glycol

The most common misconception is that using glycol is better than using water. This is actually not true because water is about 6 times more efficient at transferring heat than glycol. The ONLY reason we add glycol to water is to lower the water's freezing point. This allows the glycol chiller to operate at or below the normal freezing temperatures of a Water Chiller.

We recommend a 35% - 40% water to glycol mix. Take your time when mixing. Simply "eyeballing it" is not good enough in this situation because it's important to accurately measure.

We recommend mixing the water and glycol in a clean bucket or separate container and then add the mixture to the chiller. Do not attempt to mix the water & glycol inside the chiller itself.

Mixing Glycol

We recommend you create your mixture by starting with whole (full) gallons of glycol and then add the proper amount of water to achieve your mix ratio. After filling the chiller any leftover mix can easily be saved. Having pre-made mixture on hand makes it easy to top off the reservoir if you ever have a small spill.

Mixing Example:

1 Gallon Glycol + 1.75 Gallons Water = 36.3% Glycol Mix

(*1.75 gallons also equals 7 Quarts, 14 Pints or 28 Cups of water.)*

Glycol Fill Level

There are 2 variations to our glycol chillers and they have different ways to determine the fill level.

- If your chiller has a 3rd copper line coming into the reservoir and that 3rd line is capped off (*the pipe is sealed / temp probe is in that pipe*), you will fill the reservoir to the point of touching the bottom of the black fittings that the copper lines pass through.

- If your chiller has an exposed temperature probe/wire coming out of an open copper tube in the reservoir, you will fill with enough mix to cover the main body of the coils, but below the open copper tube by roughly 1”-2”.

The temperature probe chase tube will act as an overflow.

If your liquid level gets high enough to enter the open tube it will drain out and onto the floor.

Glycol Fill Level cont'd

After you pump the glycol mixture out to fill the supply lines and the fermenter coils or jacket, top the reservoir back off.

The copper refrigerant lines in and out of the reservoir will likely be above the liquid level when the chiller is filled as intended. These lines will frost over, which is perfectly normal.

Type of Installation

(For b*rewing specific setups)*

Our chillers can be utilized with either of the main installation styles that exist in the brewing world. There is a bit of confusion on how the two systems differ, so we want to clarify the systems before explaining how each would connect to a chiller. In either type of setup the job of the chiller doesn't change, it's there to ensure you have cold glycol mixture on hand for when cooling is called for. The only difference is how the flow of the glycol mixture is being controlled.

One pump per fermenter: Typical in the home-brew space, it utilizes a pump for every fermenter (as the name implies). The pumps are typically submersible and go directly into the reservoir. Each pump plugs into its own pump controller. The pump controller monitors the fermenter temperature. Temperature control is achieved by the regulating the pump on/off.

Glycol loop: Typical in large commercial applications, it utilizes a single heavy duty pump that runs 24/7 to provide constant flow through a loop of pipe that travels through a facility and back to the chiller. Solenoid valves are installed on the loop. A central control panel is typically responsible for managing multiple fermenters. Temperature control is achieved by regulating a solenoid open/closed.

One pump per fermenter:

STANDARD PUMPS: (1/3HP, 1/2HP, 1HP)

We supply 3/8” barbs to fit the lid, there are enough holes in the lid for 2 barbs and 1 open hole for running a power cord through for each pump. Try to put return lines as far from the pump as possible. Our standard glycol pumps go directly into the reservoir. Up to 4 on the 1/3HP and 1/2HP, and up to 8 on the 1HP. Run a short piece of 3/8” tubing from the pump to the under side of the lid, and then from the top of the lid out to the fermenter and back. A short piece of tubing under the lid on the return side is recommended. The tubing will prevent drain back when the pump shuts off. Each pump is plugged into a pump controller. The temperature probe of the pump controller goes into the fermenter. The chiller should be set to 28F-30F and the desired fermenter temperature is programmed into the pump controller. When the fermenter is too warm, the pump is turned on and the cold glycol mixture is sent to the fermenter until it is back at the desired set temperature.

One pump per fermenter:

XL PUMPS: (2/3HP, 1-1/3HP, 2HP, 3-1/3HP)

Our XL glycol pumps go directly into the reservoir (up to 8). Pump orientation and exact placement doesn't matter, the only requirement is that the inlet tube is under liquid. Run tubing from the pump through one of the holes in the rear of the lid out to the fermenter and back. Running the return tubing back to below liquid level is recommended. This will prevent drain back when the pump shuts off. If necessary, the return line can be secured to the coil using a zip tie. Each pump needs to be plugged into its own pump controller. The temperature probe of the pump controller goes into the fermenter. The chiller should be set to 28F - 30F and the desired fermenter temp is programmed into the pump controller. When the fermenter is too warm, the pump is turned on and the cold glycol mixture is sent to the fermenter until it is back at the desired set temperature.

Glycol Loop (for all glycol chillers)

Glycol loops are typically going to be installed by service professionals, so there's not much we really need to cover.

An external pump would draw the glycol mixture out of the chiller's reservoir simply by placing the pump intake line through the chiller lid and down into the glycol mixture. Most of the pumps used in this process will have some amount of draw capacity to actually pull the glycol mixture up and out of the chiller as long as that line isn't excessively long. If the pump being used isn't a self priming pump, you'll have to fill the line with the glycol mixture manually. Once you've established prime there shouldn't be a need to re-prime the pump on a regular basis.

Chiller Maintenance

If you do not need to use your chiller for a long period of time, it can simply be unplugged and left with the glycol in it.

There is no hard rule on changing out the glycol mixture because it lasts for quite a while. Glycol begins to break down when it is being heated. The chiller isn't heating your glycol mixture so it should last for quite a long time when being used properly. We tend to see our customers changing out their glycol mixture every 1 to 2 years.

The rear coil of the chiller can become dusty/dirty overtime. If it's dirty enough to reduce airflow, the cooling capacity of the chiller will be reduced. Occasionally using compressed air to blow the coils off will keep the chiller performing as efficiently as possible. The frequency of these cleanings highly depends on your operating environment. Yearly coil cleaning should be sufficient for most users, however, if you know you are operating in a particularly dusty/dirty environment then you'll want adjust your cleanings accordingly.

Common Issues

My fermenter's cold crash has stalled:

If a batch seems to get stuck around 40F - 45F, resist the natural urge to turn your chiller even colder. A stall during cold crashing is actually often caused by the glycol mixture being too cold. When the glycol mixture gets too cold, beer begins freezing to the coil forming a layer of ice. This ice layer is actually insulating the coil which keeps the beer from coming in contact with the cold glycol mixture. If you decide to turn the chiller temperature down even colder, this will cause the ice layer to continue getting thicker. This makes the problem worse by keeping the beer from coming in contact with the cold glycol mixture.

Do not run a test batch of water only in place of beer or cider. Doing so can cause a coil to freeze. The chiller should be set to 28F - 30F for most applications. A temperature of 28F may actually be too cold if working with a lighter alcohol content beer or ciders.

Common Issues cont'd

Re-check the temperature of your glycol mixture with a thermometer (not an IR gun).

- Low fill level could potentially cause the built in controller's probe to be exposed to the air. This could cause a higher reading than the glycol mixture's actual temperature.
- Poor circulation in the reservoir can cause uneven reservoir temperatures. The temperature may be getting read from a warmer pocket and your pump may be drawing from a colder pocket. This difference alone may be enough to cause a problem. You want to have your return lines on the opposite sides/ends of the reservoir away from the pump. Pointing a return line towards the temperature probe can also help.

If you identify that your glycol mixture is too cold for any reason, correct it and then turn the chiller up to 35F - 40F for a few hours to ensure you melt any ice that has formed. Then you can lower the glycol mixture's temperature back to 28F - 30F to proceed with the cold crash.

My glycol is freezing / slushing:

A mix of 35% glycol does not freeze until it's nearly zero degrees Fahrenheit. If you have any freezing or slushing then your glycol mixture is either too light of a mix OR the glycol mixture is colder than you believe it is.

Condensation rolling down lines and into the reservoir has the potential to change your mix ratio to the point of freezing at normal operating temps. The glycol mixture is mixed with the coil temp in mind, not liquid temp. The coils get 15F - 20F colder than the liquid temp.

My Chiller isn't cooling:

- Does the chiller LCD have power? (check GFI plug if not)
- Is there a green snowflake symbol that is lit up on the controller? (prior controllers have a red dot by “work” or “cool”) If there is no light indicating the controller is calling for cooling – check controller settings.
- Does the Fan and Compressor come on?
- Is the air coming out of the back of the chiller warm/hot compared to the ambient air temp?

If warm air is coming out the back, the chiller is cooling, at least partially. The question becomes why is it not working to your expectations / it's full potential.

- Check the glycol mixture's temperature with an external thermometer (not an IR gun). It is possible that the glycol mixture is cold and the controller is providing an incorrect reading. Is the controller readout steady or does it jump around?

Common Issues cont'd:

- What is the heat load? In the case of brewing – what size and how many tanks do you have? How many are you trying to cold crash at the same time?
- Double check fill level, and temperature probe location to make sure the probe is below liquid and not touching part of the coil.
- What was the percentage of your original glycol mixture? When was the last time you made ANY changes to your glycol mixture? Have you added glycol, water, or a glycol/water mixture to your chiller and if so which one did you add? When was the last time you replaced the entire contents of your glycol mixture in the chiller?

When referring to a Temperature, please clearly identify what the specific sources are.

- Ambient air temperature.
- Chiller set point or chiller reading.
- Fermenter set point or fermenter reading.
- External thermometer to measure the glycol mixture's temperature.

There are many sources of temperature, clearly identifying which temperature you are referring to is critical to an accurate and speedy assessment of the issue.

Send any questions to: support@penguinchillers.com

All chillers come with a 1 year warranty. Certain chillers are offered with an optional extended warranty for an additional charge. The length of warranty will be determine by your purchase, minimum of 1 year.

Penguin Chillers warrants the Chiller to be free from defects in materials and workmanship. The warranty term begins on the date of purchase. This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. Penguin Chillers' warranty liability extends only to the replacement cost of the product. Penguin Chillers will not be liable for any consequential, indirect, or incidental damages of any kind, including lost revenues, lost profits, or other losses in connection with the product. Some states do not allow limitation on how long an implied warranty lasts or the exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you. Penguin Chillers will, at our discretion, repair or replace the Chiller covered under this warranty. To request warranty service, please contact our technical support via email: support@penguinchillers.com.

If this product is returned to Penguin Chillers for repair the customer is responsible for shipping charges to get the chiller to Penguin Chillers. The chiller needs to be properly packaged for safe transport. This product must be insured during shipment. Customer assumes all risks of loss or damage during shipment. After receiving the package Penguin Chillers will repair or replace the chiller at our discretion. Penguin Chillers will repackage and ship the chiller back to you at no additional cost within the continental 48 states, surcharges may apply outside of the continental 48 states. Penguin Chillers will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Penguin Chillers will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any installation cost of this product.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, PENGUIN CHILLERS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF PENGUIN CHILLERS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO PRODUCT AS PROVIDED UNDER APPIICABLE LAW.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Penguin Chillers or (iii) this product is not purchased from an authorized Penguin Chillers reseller. If you are unsure whether a reseller is an authorized or not, contact us.

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www.PenguinChillers.com

Support@PenguinChillers.com

A Controller Guide was included with your chiller. Please see the FAQ Page on our website to view a copy of the controller guide and other helpful information.






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