



IceMaster G40.1

Glycol Chiller/IceBank

Instruction Manual

KL04114



KegLand Distribution PTY LTD

www.KegLand.com.au

 **WARNING** 

IF THE GLYCOL CHILLER HAS JUST BEEN MOVED DO NOT TURN ON UNLESS THE GLYCOL CHILLER HAS BEEN STANDING UPRIGHT FOR 24 HOURS. FAILURE TO DO SO WILL VOID WARRANTY.

 **WARNING** 

ENSURE THAT THERE IS ALWAYS ATLEAST 100mm OF CLEARANCE ON EACH SIDE OF THE GLYCOL CHILLER TO ALLOW ADEQUATE AIRFLOW. NOT ALLOWING ADEQUATE VENTILATION WILL REDUCE PERFORMANCE, INCREASE POWER CONSUMPTION AND VOID WARRANTY

 **WARNING** 

PERFORM A PRESSURE TEST ON ALL PRODUCT LINES PRIOR TO USE

 **WARNING** 

DO NOT RUN THE PUMPS DRY. ENSURE THE PUMPS ARE ALWAYS SUBMERGED WHEN IN OPERATION. RUNNING DRY CAN DAMAGE THE PUMPS

 **WARNING** 

ALWAYS HAVE THE AGITATOR PUMP RUNNING. IF THE RESERVOIR FREEZES IT CAN RESULT IN DAMAGE OCCURING TO THE COOLING COILS.

 **WARNING** 

NEVER SET THE RESERVOIR TEMPERATURE BELOW THE FREEZING POINT OF THE BEVERAGE BEING COOLED THROUGH THE PRODUCT LINES.



Initial Start-up and Testing

Important

Let the glycol chiller sit for at least 24 hours after delivery or after sitting on its side before turning the unit on.

Whenever the glycol chiller is operating and cooling the reservoir the agitator pump needs to be operating to keep the liquid in the reservoir agitated and avoid ice formation.

Remove the service cover of the G40 by removing the 4 screws holding it in place. Under this lid you will find the IEC cable for the agitator pump and glycol reservoir access flap.

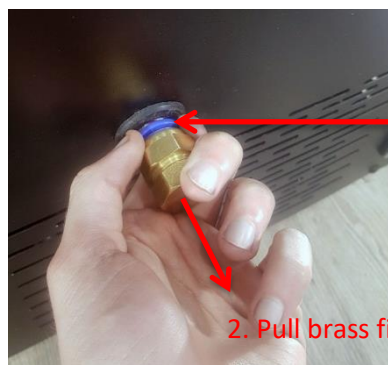
Run the IEC cable for the agitator pump through the cable outlet and plug it into the external socket as shown to the right.



Attach the ½ inch brass fitting onto the outlet/drainage pipe. This brass fitting is a push fitting and can be attached by firmly pushing the ½ inch brass fitting onto the pipe and then pulling back to ensure the fitting is secured into place.



To remove this ½ inch brass fitting from the drainage pipe, pull the blue collar towards you while pulling on the brass fitting. Do not rotate the brass fitting as you try and remove it as this can result in it cutting the drainage pipe and it not sealing upon reassembly.



1. Pull blue collar towards you

2. Pull brass fitting towards you

Install the castor wheels

- Make sure the G40 is empty
- Carefully lay the G40 on its side on a soft surface such as carpet, cardboard or a towel
- Attach each castor wheel to the base of the G40 using 4 screws
- Install the two locking castor wheels at whichever position will be most accessible for you.
- Position the G40 back upright and leave for a minimum of 1 hour before turning it on to allow the refrigerant to settle.

After getting your G40 setup, firstly perform a leak test and cooling test on your system to ensure that all connections are water tight, the agitator is operational and the glycol chiller is chilling the reservoir correctly.

EVABarrier hosing can be attached to the product lines using multiple different types of duotight fittings as shown below:



- A – duotight 8mm Push in Elbow ([KL02400](#))
- B – duotight 8mm x ¼ BSP Male ([KL06897](#))
- C – duotight 8mm Ball Valve ([KL06934](#))
- D – duotight 6.5mm x 8mm Reducer ([KL07481](#))
- E – duotight 8mm Push in Joiner ([KL02370](#))
- F – duotight 8mm Push in Joiner with 8mm Plug ([KL02370](#) + [KL06958](#))



Leak testing product lines

It is essential to pressure test all four product lines prior to running any liquid through them for dispensing.

The product lines need to be pressure tested to a pressure that is at least 1.5 times the pressure that will be used for dispensing to a maximum of 50psi. For example, if your dispensing pressure is 20 psi then your product lines should be pressure tested at 30 psi and your testing pressure shouldn't exceed 50 psi.

The product lines can be leak tested via multiple methods which are outlined below. It is a good idea to test the system using multiple methods to be certain the system is holding pressure:

1. Pressure decay test

Step 1. Attach a duotight push in fitting to each product line.

Step 2. Push EVA Barrier hosing connected to a regulated pressure source into the duotight fitting on the "Beer Inlet Tube 1".

Step 3. Plug the duotight fitting on the "Beer Outlet Tube 1" with a duotight Plug.

Step 4. Set the pressure on the regulator to 1.5 times the dispensing pressure up to a maximum of 50 psi.

Step 5. Turn the gas cylinder off and leave to sit for a few hours. Then check if the pressure on the regulator has decreased from the set pressure.

If the pressure has dropped double check that the leak isn't occurring externally from the G40. Check all duotight connections and connections to your gas cylinder or regulator with a soapy solution to check for the formation of bubbles indicating a leak.

If the pressure remains stable then "Beer Outlet Tube 1" has passed the leak test.

Perform the above steps on "Beer Outlet Tubes 2-4"

2. Bubble (Air-leak) test

Step 1. Fill the reservoir with water.

Step 2. Attach a duotight push in fitting or elbow to each product line.

Step 3. Push EVA Barrier hosing connected to a regulated pressure source into the duotight fitting or elbow on the "Beer Inlet Tube 1".

Step 4. Plug the duotight fitting or elbow on the "Beer Outlet Tube 1" with a duotight Plug.

Step 5. Set the pressure on the regulator to 1.5 times the dispensing pressure up to a maximum of 50 psi.

Step 6. Look for the formation of bubbles in reservoir indicating a leak

Perform the above steps on "Beer Outlet Tubes 2-4"



3. Hydrostatic leak test

Step 1. Empty the reservoir

Step 2. Attach a duotight push in fitting to each product line.

Step 3. Plug the duotight fitting on the “Beer Outlet Tube 1” with a duotight Plug.

Step 4. Push EVA Barrier hosing connected to a regulated water source into the duotight Fitting on the “Beer Inlet Tube 1”.

The pressure of the water source can be regulated using an inline regulator for example ([KL15035](#)) or by connecting a keg full of water pressurised at 1.5 times the dispensing pressure up to a maximum of 50 psi.

Step 5. Look for any leaks in the reservoir from the product line.

Perform the above steps on “Beer Outlet Tubes 3-4”

Testing the agitator pump and compressor

Step 1. With the G40 unplugged fill the reservoir with 20L of water, ensuring that all cooling coils and the impeller of the agitator pump are submerged.

Step 2. Attach 10mm ID silicone tube to the Water Out barb

Step 3. Connect this silicone tube to the adjacent Water In barb.

Step 4. Plug the G40 in using the provided IEC cable and turn the red power switch on.

Step 5. Set the temperature on the temperature controller on the front of the G40 to 2°C

To change any settings on the temperature controller for the reservoir such as temperature hysteresis or calibration refer to this instruction manual:

[KegLand STC1000 Instructions](#)

Step 6. Plug the agitator pump into the external IEC socket at position (X)

Step 7. Turn the Agitator pump on and ensure the pump works.

Step 8. Leave the G40 for 12 hours to ensure that it drops the temperature of the reservoir to the set temperature on the temperature controller.

The system has now been tested for cooling and leaks and is ready to be used to chill a font or dispense from a keg.



Filling the reservoir

The G40 can be operated with either just water in the reservoir or both water and glycol to reduce the freezing point of water.

IMPORTANT: If you are only using water in the reservoir and not glycol then do not set the temperature of the reservoir below 2°C.

Fill the reservoir to a total of 20L with water if the reservoir is set at 2°C or an appropriate Concentration of glycol solution if dropping the reservoir below 2°C according to the table below. Ensure the cooling coils are submerged. The amount of glycol required to be added to the reservoir depends on the desired set temperature of the reservoir which is dependent on a number of factors including heat ingress into the entire system, insulation of the glycol lines, ambient temperature, the number of kegs being cooled and the temperature of the kegs. Use the table below to determine what percentage of glycol you require.

| Glycol Volume % | Freezing Point °C | Specific Gravity at 21°C |
|-----------------|-------------------|--------------------------|
| 0 | 0.0 | 1.000 |
| 10 | -3.3 | 1.006 |
| 20 | -7.8 | 1.015 |
| 30 | -13.3 | 1.024 |

You can measure the glycol percentage using a calibrated refractometer and comparing to the specific gravity at 21°C in the above table.

We would advise running a 20% glycol solution however, if you do not have a jacketed fermenter or have the fermenter in a very warm environment you can run it at a higher glycol concentration. The pumps are not designed to be run with a glycol concentration higher than 30% hence it is not advised to exceed this glycol concentration. Doing so may damage the pumps.

IMPORTANT: Do not set the reservoir set temperature to be below the freezing point of the beverage you are dispensing. Doing so can result in the beverage freezing in the product lines and damage occurring.

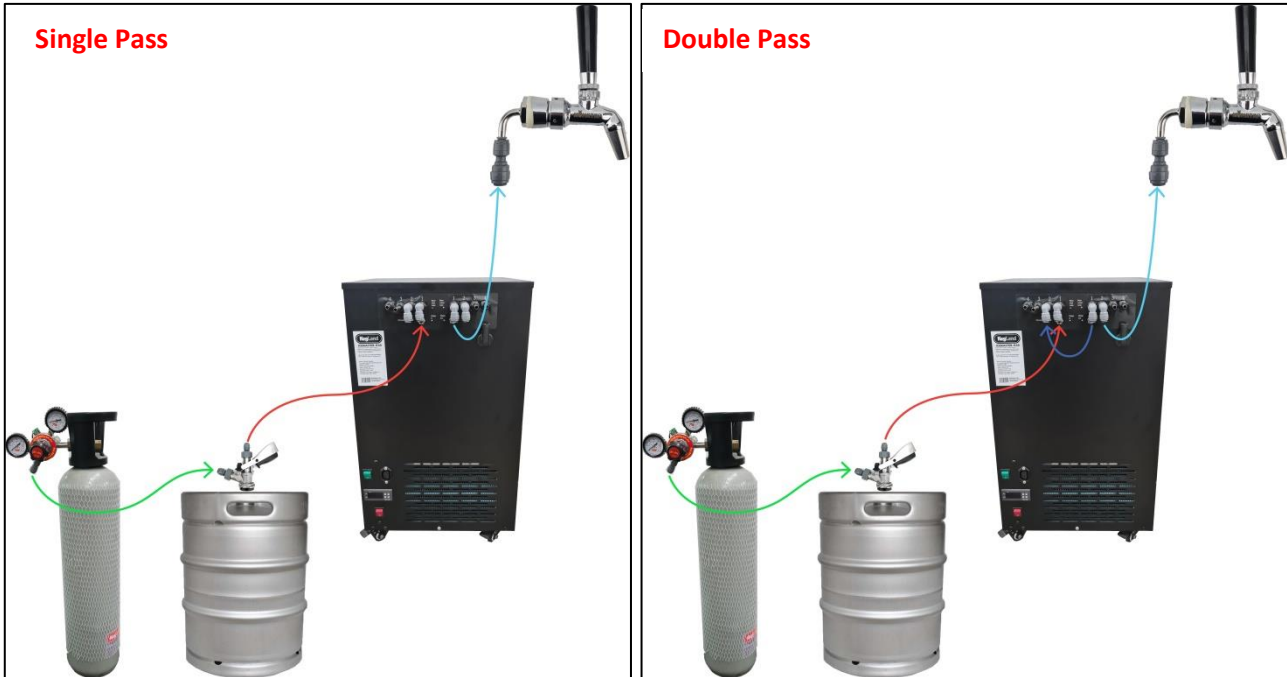
Always determine the freezing point of the beverage you are dispensing and use this as a lower limit for the reservoir set temperature to not exceed.



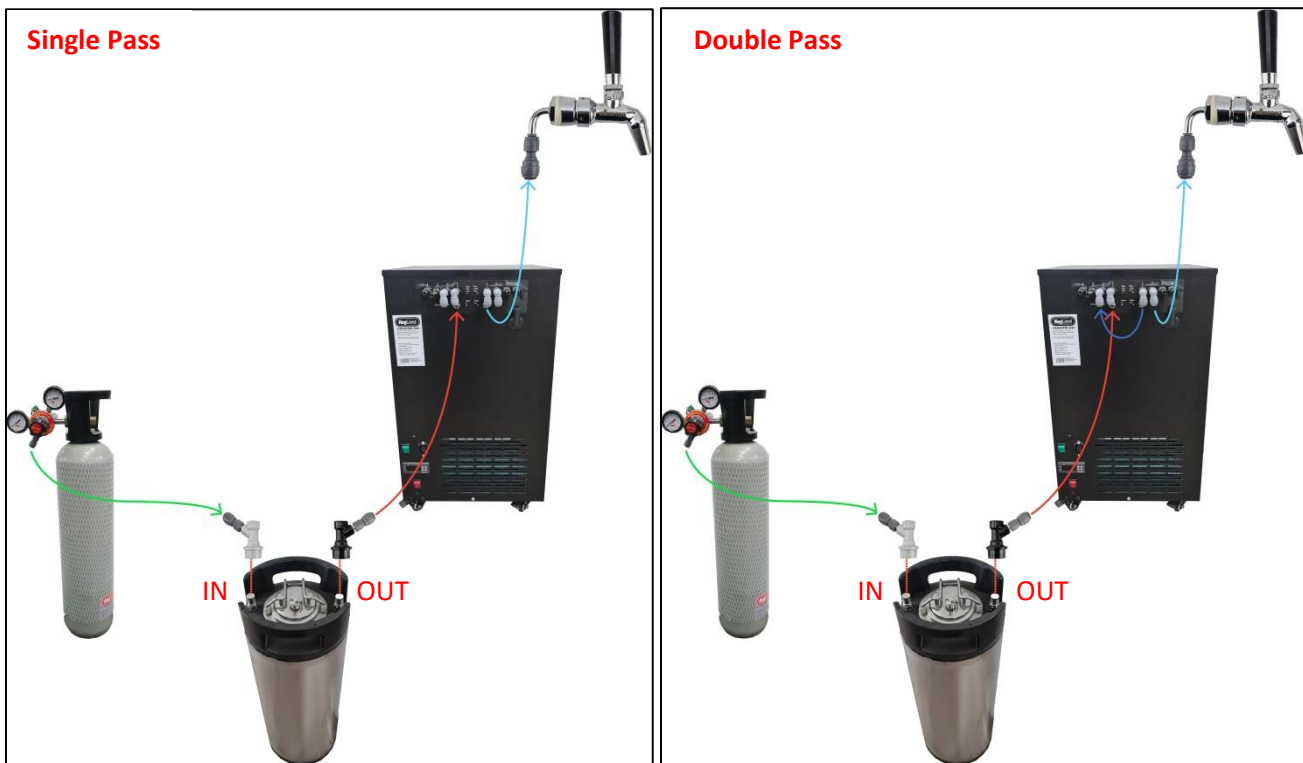
Dispensing beverages through the G40

If your keg is stored in a very warm environment the beverage can be passed twice through the G40 to drop its temperature to serving temperature. A single pass through the G40 will be able to drop the temperature of the product by 15°C, hence if the storage temperature of the keg is more than 15°C above the desired serving temperature then you may need to pass the product through the G40 twice. Use the diagrams below to determine how to dispense through the G40.

1. 50L Keg – Single Pass and Double Pass



2. 19L Ball lock Keg – Single Pass and Double Pass





Please note that the above diagrams are for demonstration purposes only. You may have a different style coupler or tap and shank setup to what is shown in the above diagrams.

The pressure to be set on your regulator differs according to the temperature that the keg is stored at. If the product is stored at a higher temperature it will require a higher pressure to maintain the desired level of carbonation. Refer to a carbonation chart to determine what pressure you should be setting your regulator at to reach your desired level of carbonation.

For most styles of beer, you should be aiming for a carbonation level of between 2.3-2.8 volumes of carbonation with the average carbonation level being 2.6 volumes (if you are unsure of the carbonation level of the beer i.e. if it is a commercial keg then assume it is at 2.6 volumes of carbonation). To achieve a specific carbonation level during carbonation or priming refer to the table in the link below and correlate the temperature of the keg with the desired carbonation level.

[KegLand Carbonation Chart](#)

NOTE: Do not try to fix a slow or fast pour rate by adjusting the dispensing pressure. This will result in your beer either going flat or over carbonated. It is best to adjust the beverage line length and diameter. If the pour is too fast and is producing a lot of froth then increase the length of the beverage line between the G40 and the tap. Alternatively if the pour is too slow then decrease the length of the beverage line between the G40 and the tap.

When adjusting your beverage line length to achieve the perfect pour it is always best to start with a longer length of beverage line as you can always trim a longer length of hose.

Flooding a font

The G40 is supplied with an in-built agitator pump which also doubles as a pump which can be used to flood a font. To flood a font attach silicone tubing to the 10mm "Water OUT" barb and then attach this to the glycol inlet on your flooded font. Then attach silicone tubing to the outlet on your flooded font and attach this to the 10mm "Water IN" barb on the G40.

For best results you should insulate the silicone tubing between the G40 and the flooded font. Furthermore, if your flooded font is in a very hot environment then the font may not ice up as the heat ingress into the font may prevent the condensation forming ice.

Using the G40 for fermentation control

Although the G40 can be used to control fermentation temperature it should primarily be used to flood a font or dispense product, instead we would highly advise a G20 primarily be used for fermentation control. If you were going to use the G40 for fermentation control then it is suggested you adhere to the following advice and steps.

It is not advised to use the agitator pump to supply glycol to cool a fermenter, this is due to this pump not being powerful enough to overcome the resistance of the cooling coils or large fermenter jacket, and hence it is advised that an external pump be used connected to an external temperature controller ([KL01946](#)).



Furthermore, it is not advisable to use the temperature controller on the G40 as a temperature controller for fermentation control. This is because if the fermentation temperature is set on the temperature controller on the G40 it will result in the temperature of the reservoir being set to your fermentation temperature and hence there will not be a high enough temperature differential between the temperature of the glycol and the temperature of the fermenter to maintain stable fermentation temperatures. Instead, the following method should be employed to setup your G40 to cool a jacketed fermenter up to 500L:

1. Connect an external pump to an external temperature controller.
2. Attach tubing to the ½ inch drainage port on the G40 and connect this tube to your external pump
3. Attach tubing to the outlet of the external pump and attach this tube to the cooling coils on your fermenter
4. Run tubing from the outlet of the fermenter cooling coils back into the reservoir of the G40
5. Set the temperature on the G40 to -2°C (if using glycol) or to 2°C (if only using water in the reservoir).
6. Attach 10mm ID silicone tube to the “Water Out” barb and connect this silicone tube to the adjacent “Water in” barb. Run the agitator continuously to keep the reservoir agitated and prevent the reservoir from freezing.
7. Insert the temperature probe of the external temperature controller into the thermowell on your fermenter.
8. Set the temperature on your external temperature controller to your set fermentation temperature. This will cycle the pump on and off to supply cold glycol solution only when the temperature of the fermenter increases above the set fermentation temperature. When under load such as when cooling a fermenter it can take a longer time to cool the reservoir down to the set temperature on the glycol chiller. This time is dependent on a number of variables including but not limited to:
 - Jacketing of the fermenter (jacketed or non-jacketed)
 - Number of fermenters being cooled
 - Ambient temperature
 - Heat ingress

MAINTENANCE

If the glycol solution has been stored for an extended period of time then it is suggested to replace the solution, despite glycol having antimicrobial properties. It is recommended to replace the glycol if it has changed colour dramatically or between 12 to 24 months of usage. To replace the glycol solution empty the reservoir using the drainage port and then refill with the required concentration of glycol using a refractometer to confirm the concentration.