

Keeping your CO<sup>2</sup> laser tube at the correct operating temperature is critical to the life of the tube. For Southern African conditions, we recommend using a chiller for this purpose.

We supply the CW-5200 (Single ports) / JZ-5200 (Dual ports) Industrial Water Chiller range, which are chillers with compressors like your fridge. If you have purchased a chiller with your machine, we will set it up. If you add a chiller later, follow these directions:

## Installation, use, and maintenance.

Open the water cap on the top of the unit to fill it with distilled water. Tap water contains contaminants that will create issues (see Technical Bulletin #29). The chiller will take about six litres of water. Use a funnel to avoid spillage. Watch the water level observation window on the back as you fill the tank. It will take about 3 litres of water before the indicator starts to show in the window; this is normal.

Pour water until the indicator reads about half way up the yellow gauge. This level will drop to the top of the normal range after your laser tube is filled and all the air is evacuated from the tube and the water lines.

*OPTIONAL:* Add 4 to 5 drops of aquarium algacide to the water. We recommend Tetra Algae Control.

## Connecting the water lines.

NOTE: The chillers are shipped with protective caps over the inlet and outlet fittings to prevent contamination from debris. Please remove these and recycle or discard them.

Connect a water pipe from the inlet fitting on the chiller to the water outlet port on your laser. Connect the second water pipe from the outlet fitting on the chiller to the water input port on your laser. Use cable ties to ensure that the pipes do not come off under pressure. If you have a dual port chiller with only one laser, bridge the middle inlet/outlet ports with a short length of pipe (about 25cm long to avoid kinks).

## Powering on the unit for the first run:

With the Power Switch in the OFF position, plug the power cable firmly into the power socket and make sure it is fully seated. Plug the other end of the power cable into your laser power strip - or a properly earthed wall outlet.

NOTE: These chillers can draw 4.5A to 6.5A of power when the compressor is on. It is highly recommended to use a dedicated wall outlet rated at 15A. We do not recommend using a household extension lead.

When turning on the power switch, you will hear an alarm for about three seconds, while the water starts flowing.

NOTE: Do not power off the chiller during startup. The normal startup will take from 1 to 3 minutes, and the compressor will not start immediately. The chiller must operate for at least 3 minutes before you can power it off. Turning the power off during the startup mode may cause damage to the internal components.

If you see air bubbles in the tube after 5 minutes of run time, pinch the water outlet hose for a brief moment (a momentary alarm will sound) to dislodge the stuck bubbles; repeat if necessary. Check all water connections for leaks. Keep a watchful eye for the first 10 minutes of operation on all of the water pipe connections, as well as the water indicator gauge to check for leaks. Also open the back cover of your laser and ensure that water has filled the tube and is flowing, and there are no leaks inside the laser. If you filled the tank to the appropriate level, the water indicator gauge should be at the top of the green, up to the middle of the yellow. Although this is a sealed system, please check your water indicator gauge every day to ensure proper water levels in the tank.

Locate the chiller in its final position in an area with no obstructions and at least one foot of clearance all the way around for proper airflow.



## Maintenance

There is very little maintenance involved, but do take note of the following:

There are two ventilation doors, one on either side of the chiller. If you depress the two tabs on top, you can pull open the door. Fitted inside the door are filters in each side. These filters should be cleared of dust at least once a week (you can use a vacuum cleaner), and washed under running water at least once for every 60 hours of use. Dust build-up in these filters will cause the chiller to overheat and malfunction. Wipe down the outside of the chiller and the vent doors while cleaning the filter screens.

It is highly recommended to change the water at least once every three months, but you should inspect the water in the CO<sup>2</sup> tube at least weekly. At the first sight of a change in clarity (cloudy water), the water should be changed.

**NOTE:** If you see any discoloration in the water in your tube, that indicates contamination, and the tank and lines need to be cleaned before use. Drain and refill the water tank, and add 6 capfuls of ordinary unscented laundry bleach. Run the chiller for about half an hour, and then drain and refill again following the Water fill procedure on page 1. Visual inspection is also good practice every day. Inspect the water lines for leaks, check the water level, the inside of your laser for leaks and water clarity, and check for obstructions on or around the chiller. The chiller requires approximately one foot of clearance from anything that could obstruct the airflow.

## FAQ

Q: Do you recommend “Intelligent Mode”?

A: If your laser and chiller are in a temperature-controlled room, yes, as Intelligent mode will keep your laser tube within 2° of the ambient room temperature, which is the optimal setting for your tube. Going -5° or more below ambient room temperature will lead to condensation on the tube and a probable “short down” which will damage the tube and cause it to stop operating, requiring replacement. The water in your tube and chiller should never be more than 5° lower than room temperature. If the ambient air temperature is higher than 28°, then you should use “Constant Mode” (see Technical Bulletin #17 for how to set it).

Q: How do I know if the room temperature is too high to use my laser?

A: (In Intelligent Mode) If your room temperature is too high to operate the laser. You will get an audible alarm, and the LED screen will read E1. In this case, turn off the laser and the chiller immediately. To resolve the problem, lower the temperature of the room.

Q: How do I know if the water temperature is too low to use my laser?

A: (In Intelligent Mode) If your water temperature is too low to operate the laser You will get an audible alarm, and the LED screen will read E3. In this case, turn off the laser and the chiller immediately. To resolve the problem, raise the temperature of the room.

Q: How do I know if the water temperature is too high to use my laser?

A: In rare cases, after constant, long periods of laser use, your water temperature may get too high for the chiller to compensate. You will get an audible alarm, and the LED screen will read E2. In this case, turn off the laser immediately but leave the chiller on. To resolve the problem, wait for the water temperature to stabilise. You can press the RST button once to silence the audible alarm while you wait.



Q: Are there other alarm codes?

A: Yes, there are malfunction alarms as well. E4 is a failed room-temperature sensor, and E5 is a failed water temperature sensor. Both of these error codes would require factory service.

Q: I have an alarm but there is no error message, what is causing this?

A: When you get this alarm, you will see the red LED on the controller lit up; this is a water flow alarm. Stop the laser immediately if it hasn't stopped already. Find the problem in the water pipe that's causing the obstruction. There may be an object on the water pipe, or a kink in the pipe. If there are no visible kinks in the water pipes, the kink may be inside your laser. Open the back door and find the obstruction. Do not continue using the laser until the red LED turns off. This means water flow has been restored.

Q: What is the optimal room temperature and operational range for a CO<sub>2</sub> laser?

A: The best performance and longest life of most laser tubes is obtained with an operational temperature in the ranges of 20° – 25°C . Your ambient room temperature should remain between these temperatures for the best performance. A CO<sub>2</sub> laser should always be used in an environmentally controlled room.

Q: What is the metal plug that looks like a microphone jack used for?

A: This is an optional water flow sensor connector for the chiller. Your laser should already be equipped with flow protection, but if it is not, you would wire this to your water sensor connection to the controller (WP & GND on the controller). Almost all 50W & above lasers already have a water flow circuit, so the chances of you needing this are slim. To check if you need it, look at the WP & GND terminals on your controller. If there are 2 wires coming out and going to your laser tube, you might not need to use this accessory.

If your laser does not have water flow protection, or if it has a water flow sensor inline (look at the water pipes inside the laser tube compartment), you can contact us for advice on how to remove or bypass it.

