

# How to Set Up a Semi-Automatic CO2 Injection System

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This [system](#) will help your plants grow and flourish by replenishing CO2 levels in your planted freshwater aquarium. CO2 will also help stabilize pH in your aquarium. Therefore, it is crucial to maintain the proper CO2 levels. Factors controlling the pH level in your aquarium include the amount of minerals present in the aquarium water (alkalinity) and the concentration of CO2 (acidity). Excess CO2 levels can lower the pH level dramatically and severely stress your fish. By adding an appropriate amount of CO2 to your aquarium (a level which you must determine by regularly monitoring water parameters), this system helps stabilize your water pH. If you achieve the desired CO2 level but your pH remains high, you can reduce the alkalinity by performing small water changes using mineral-free water that has been purified by reverse osmosis or distillation.

**Please note:** Because light is integral to photosynthesis and the creation of oxygen, your plants will stop using CO2 when aquarium lights turn off. Instead, they will start producing CO2. To avoid harmful CO2 overdose and harmful drop in pH levels, do not add CO2 to your aquarium when aquarium lights are off.

## System components:

- CO2 regulator with solenoid
- CO2 glass diffuser
- 20 feet of flexible silicone CO2 tubing
- Bubble counter w/built-in check valve
- Timer



## Additional tools/supplies you'll need:

- CO2 tank and plastic washer
- Adjustable wrench
- Scissors
- Tape measure
- Test kit
- Light timer (if your aquarium light cycle isn't already controlled by a timer)

If you need assistance with system assembly or use, please feel free to contact our Aquatic Technicians at 1-800-443-1160.

## Directions:

### Putting your system together:

1. Obtain a 5 lb. CO2 bottle from a local vendor such as a welding supply company. You can also contact your local

fire station for information on obtaining a CO2 bottle. Before tightening the CO2 pressure regulator onto your CO2 bottle, install a plastic washer to help ensure a leakproof connection. Connect the pressure regulator and bottle as tightly as possible to avoid a sudden (and potentially startling) disconnection.

2. Adjust the needle valve to the "off" position.
3. Carefully open the bubble counter and fill 1/3 of the counter tube with fresh water, making sure that the open end of the rigid tubing inside the larger tube is submerged. Be sure the bubble counter o-ring and the top of the large counter tube stay dry when you replace the top on the bubble counter. Otherwise, the counter will not be CO2 tight.
4. Use the bubble counter mounting bracket to attach the bubble counter to the side of aquarium or a wall near the aquarium for easy visibility.
5. Cut a length of tubing to connect the CO2 needle valve and the bubble counter. Measure the distance between them to determine the correct length (add a few inches to your measurement to ensure a proper fit and connection).
6. To connect the silicone tubing to the output of the CO2 needle valve, remove the compression nut, insert tubing through the nut and onto the output nipple, then tighten the compression nut back onto the output to lock it in place. Next, attach the other end of the silicone tubing to the input side of bubble counter (the shorter of the two nozzles on the bubble counter - the one with rigid tubing extending into the counter).
7. You will now need another length of flexible tubing to connect the bubble counter and the CO2 diffuser. Do not cut tubing until you've selected the ideal location for the diffuser in your aquarium. **Please note: The glass diffuser is VERY FRAGILE, and must be handled with great care.**
8. Place the diffuser in a location in your aquarium with moderate water flow. Try to keep the diffuser low in your aquarium to maximize CO2 saturation.
9. Once you've selected the right spot for your diffuser, cut a length of tubing accordingly. Then, attach the one end of the tubing to the output side of bubble counter (output also includes the check valve), and the other end to the glass CO2 diffuser.

#### **Setting your system timer:**

**Please note:** If your aquarium lights aren't already on a timer, we recommend adding one so your light cycle and CO2 system cycle occur simultaneously.

Once you've successfully connected your CO2 regulator, bubble counter, and diffuser, you're ready to set the system's operation to coincide with your aquarium's lighting cycle. After you've set your system timer (see below), simply plug your pressure regulator into the timer outlet, and plug the timer into a nearby wall outlet. To set the included timer, turn the dial to the current time, push down the tabs for the hours you want your system to be on, and slide the timer's override switch to "AUTO." The timer will automatically shut off the CO2 system when your lights go off, provided that you specify the correct "lights out" time.

#### **Starting your system:**

To start your CO2 system, make sure it's plugged in (ideally, perform this step during the "lights on" phase of your timer setting), and adjust the output of the CO2 needle valve so you can start counting bubbles flowing through your bubble counter. As a general rule, 1-2 bubbles per second should be adequate.

#### **Monitoring CO2 levels:**

To determine the ideal level of CO2 for your aquarium, monitor pH, alkalinity, and CO2 levels in your aquarium using a quality test kit. Adjust the CO2 output as necessary until levels are safe/adequate.

As always, if you have any questions, please contact us at 1-800-443-1160.