

Gravity Feed Drip Irrigation Kit



Introduction

Thank you for purchasing a Gravity Feed Drip Irrigation Kit for your home garden! This kit has been custom built to provide you with the necessary tools and materials to grow healthy plants. With the items included, you will be able to water plants of varying sizes without requiring the minimum water pressure our other kits require. In this manual you will find instructions for each part of the system, helpful tips, and an overview of the parts included in each kit.

Description

Our gravity feed drip kit comes in three sizes: 25 drip points, 50 drip points, and 100 drip points. These kits are designed specifically for ultra low-pressure applications, such as watering plants using stored rainwater in a barrel or other container. Gravity pressure for water accrues at the rate of .433 PSI per foot of height, and by .0014 PSI per kilogram of water in a one square meter area. Note that the pressure output of water mass in a tank *decreases* as water is used. As you can see, it can be difficult to have enough mass of water and/or enough height to consistently achieve a 10-15 psi, which is what most drip systems require to operate properly. Even super low-pressure drippers often require at least 7 psi.

While this issue can often preclude use of harvested rainwater with drip irrigation, that doesn't need to be the case. Water will naturally flow from areas of relative high pressure (such as your rainwater tank) to areas of relative low pressure (such as anywhere that *isn't* your rainwater tank), and it only takes a few slight modifications to a drip system to let you harness this natural tendency of water. Since the drippers themselves are the item with the most stringent minimum pressure requirements, our kits replace them with ¼" ball valves to address this problem.

Materials used in this kit include poly tube, poly tube fittings, and ¼" barbed ball valves. The kit also includes a simple t-filter to prevent sediment from entering the system. If you'd like a timer, we suggest TDS model number C014. It is important to use a timer rated for zero pressure (like the C014), as normal timers require a minimum pressure on their inlet side to operate properly.

Important Tips and Notes

Before setting up your irrigation system, please read through the tips and notes below as well as the rest of the manual, so you fully understand the system. If you have any questions not answered in the manual, please contact one of our customer service representatives at **877-597-1669** or by emailing **customerservice@dripirrigation.com**

- Each kit contains all the parts required to install a complete drip irrigation system. If more parts are needed, the system you will build with the kit is easily expandable using the other parts found on our website.

Important Tips and Notes

- We suggest that poly tube and micro tube be installed above ground only. It is safe to mulch over it, but burying poly tube beneath the ground tends to cause it to crimp, restricting flow and reducing effectiveness of the system. Contact us if you are interested in burying your poly tube.
- Drip irrigation systems should be used with clean water. The t-filter included with this kit will help to filter out harmful sediment, though you should check it regularly during use to determine how often you will need to clean it.
 - o Since this kit doesn't use traditional drippers, it will be less prone to clogging than a normal drip system

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- If installing your system in an area where freezes occur, make sure to winterize your system before the first freeze. If possible, disconnect the system and store inside until temperatures warm. If this is not feasible, disconnect your system from the water source, open all line ends, and allow to drain thoroughly for at least a week before the first freeze. Allowing the components to freeze with water inside can result in cracks, causing leaks when you start the system again.
- Poly tube softens and becomes more flexible when warm, making it easier to install emitters and fittings and punch holes. Do not use direct flame or intense heat with any poly tube or plastic fitting as this will cause irreparable damage. Leaving the poly tube out in the sun for a while will usually suffice.
- Compression fittings are used to connect poly tube to poly tube or threaded components to poly tube.
 - o To use a compression fitting, push the poly tube into the end of the fitting firmly and at an angle, then walk it up and down while pushing in until the poly tube is inside the fitting by at least half an inch. Be aware that once you've gotten the poly tube into the fitting it's *very* difficult to remove it!
- After installing your system, you will need to run it – aka let water pass through it – and adjust each ¼” ball valve. Due to this system having no pressure compensation or backpressure of any significance, water will naturally flow more heavily through the valves closest to the tank. The flow rate of each valve will diminish the further it is from the tank. To compensate for this, you’ll want to adjust the valves closest to the tank so they are more closed, while leaving the valves furthest from the tank more open. This can be a bit tedious, but it is the best way to evenly distribute water across your system without needing to meet the minimum pressure requirement of traditional drippers.
- It is not recommended that you use this kit to water plants in pots or hanging baskets or in very hilly terrain. Due to the extremely low pressure most gravity feed systems have, it can be difficult or impossible to get water to go up even short vertical distances. These kits are best used in flat areas.
- Only use an approved hole punch tool to punch holes in ½” poly tube. Using other tools such as screwdrivers, awls, or drills will result in jagged edges and can cause leaks.

Specifications

- Screen Filters
 - o Maximum recommended flow rate: 660 gph
 - o Maximum recommended pressure: 120 PSI
 - o Filtration level: 150 mesh/100 micron
- ½” (.600 ID x .700 OD) Poly Tube
 - o Maximum recommended flow rate: 220 gph
 - o Maximum lateral run: 400’
 - o Pressure loss every 100’: 4.4 PSI
- ¼” Micro Tube
 - o Maximum recommended flow rate: 30 gph
 - o Maximum lateral run: 30’

Installation Instructions

Head Assembly: Connection to Hose Spigot

A drip irrigation system begins at the water source. The parts at the beginning of the system are called the “head assembly,” which is designed to attach to a hose spigot or garden hose. Since a gravity feed system doesn’t require a backflow preventer or pressure regulator, your head assembly only consists of two parts: the F001 t-filter and the LF003 swivel adapter. Thread the F001 onto the ¾” MHT (male hose thread) outlet of your tank, spigot, or garden hose. Once you have your poly tube attached to the LF003, thread the swivel end onto the male threaded outlet of the t-filter.

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Each component's inlet is $\frac{3}{4}$ " FHT (female hose thread) and the outlets of each component are $\frac{3}{4}$ " MHT (male hose thread). The poly tube adapter has a compression outlet, meaning it attaches directly to the poly tube.

1/2" Poly Tube Fittings

The $\frac{1}{2}$ " poly tube will be your main distribution line, getting water from the spigot or hose to the various parts of the garden you want to water. It is very important to make sure the lengths are correct before you cut. *Remember the adage: measure twice, cut once.* Make all cuts as straight as possible as any angled cuts on poly tube can result in loose fittings and an increased chance of leaking once the system is operational. The tees and elbows are meant to help route poly tube at right angles. $\frac{1}{2}$ " poly tube tends to crimp when bent at too tight an angle, restricting the flow of water, and decreasing the functionality of your system. The poly tube line end components are meant to be used as their name implies: put them at the end of the $\frac{1}{2}$ " poly tube to stop the flow of water. When installing your system, run your $\frac{1}{2}$ " poly tube throughout the area you'd like to water, getting it as close to your plants as possible. Since the 25 drip point version of this kit doesn't include any $\frac{1}{4}$ " tubing, you'll need to ensure that your $\frac{1}{2}$ " poly tube runs along the base of every plant you'd like to water. For larger kits, it will suffice to run the $\frac{1}{2}$ " poly tube generally throughout the area and use $\frac{1}{4}$ " tubing to reach plants not directly adjacent to the larger tube.

$\frac{1}{4}$ " Micro Tube and Fittings

The 50 and 100 drip point variants of the kit include $\frac{1}{4}$ " micro tube and $\frac{1}{4}$ " fittings. These are included to help reach plants that are not adjacent to the $\frac{1}{2}$ " poly tube. $\frac{1}{4}$ " micro tube can be used in two ways, either by connecting it to the outlet of a $\frac{1}{4}$ " ball valve without using the included SF001 barbs, or by using the barb to connect the $\frac{1}{4}$ " micro tube to the $\frac{1}{2}$ " poly tube, and putting the $\frac{1}{4}$ " ball valve at the end of the line. Either way, it's important to use a S003 stake to hold the end of the micro tube in place. Whenever you need to connect a $\frac{1}{4}$ " fitting or ball valve to $\frac{1}{2}$ " poly tube, use the included hole punch tool.

$\frac{1}{4}$ " Ball Valves

$\frac{1}{4}$ " ball valves are used in these kits instead of drippers. You should put 1-2 ball valves at the base of each plant. After they have been installed, you will need to run the system and adjust each one so it emits the amount of water you want it to. Keep in mind that the valves closest to the tank will have the highest flow rate, and vice-versa. While adjusting each valve can be tedious, it is the best way to evenly distribute water to the plants on your system. If a ball valve becomes clogged, simply open it all the way and use a paperclip or other small item to remove the obstruction.

System Startup

After you have installed all the components, it is time to begin the initial startup of the irrigation system. To do this, make sure all $\frac{1}{2}$ " poly tube line ends are open, then turn the system on for about one minute. This will flush any debris (bits of soil, pieces of plastic, small rocks, etc.) out of the system. Turn the water off, close the line ends, then turn the water back on. This will let the system "pressurize" so you can check that your ball valves are working and that there are no leaks. You should see water begin to drip out of each valve installed on the system. Remember that you can (and should!) adjust each valve to increase or decrease how much water it emits until you're satisfied with the flow rate. You may see some leaks forming where the tube or tape was connected to a fitting. The next section gives more information on how to handle leaks.

Repairing Leaks

It is normal for some of the connection points with $\frac{1}{2}$ " poly tube to leak during the first few runs of the system. However, if there is a constant leak at the connection point, you will have to take out the fitting and replace it with a new fitting. Compression fittings have an internal fitting at both sides that hold the tube. Once you pull poly tube out, the fitting inside is no longer usable as it can become warped and cause leaking. Leaks can also be caused by small punctures. To fix both types of leaks, first cut the poly tube on one side of the hole or fitting as close as you can while getting a straight cut. Next, do the same thing on the other side of the hole or fitting. Once both cuts are done, a coupling or other fitting to connect the two ends of poly tube.

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Next Steps

Now that your system is installed you can rest easy knowing you are on your way to having the nicest garden in the neighborhood! We hope you enjoy the simplicity and convenience of our Drip Tape Irrigation Kit. If you would like to add more items to your kit in the future, feel free to reach out to a customer service representative by emailing customerservice@dripirrigation.com or by calling us at 877-597-1669. We will guide you through any additions and offer our knowledge and expertise to make your system even better.

Thank you from The Drip Store Team!