



What is the Dragon-Line® Hybrid System?

Dragon-Line® is the Orange mobile drip irrigation system. Our tubing is coextruded from a blend of high-quality PE resin and advanced pressure compensating emitters. These emitters are welded to the internal wall of the drip line and are fully operational at 7 PSI. Each drip line is attached to the pivot with a Dragon Flex Hose that is either 10 feet or 13 feet in length that attaches to the manifold. These flex hoses ensure that driplines remain on the soil surface as it is dragged behind the pivot. This ensures the most efficient application of water possible by a center pivot by minimizing evaporation and eliminating drift of water droplets caused by wind. Dragon-Line® not only applies water efficiently, but also uniformly as water is able to move through the soil profile through capillary action and increases water infiltration. This allows for irrigation to move deeper into the soil profile as well as maintain plant available water in the upper layers. The patented technology of Dragon-Line® combines the efficiency of drip irrigation with the flexibility and economics of center pivots and linear move systems. We also allow farmers to keep the spray nozzles on their pivot by as they can use either our dual valve assembly or UP3 adaptor that will allow the operator to switch between sprays and drip lines as needed.

Dragon-Line® offers the most efficient irrigation application possible, with the slow release and low-pressure application of water and nutrients directly to the soil surface. Mobile drip irrigation systems offered by Dragon-Line LLC. brings precision irrigation to precision farming. This is especially true with the introduction of the hybrid style as the height of the manifold is now fully adjustable to adapt to any crop and crop rotation thanks to our V-Jack cable hooks. We have also designed to the hybrid system where the position of the drip line relative to the row is adjustable as well with the use of our patented winch assembly. This allows for unparalleled adjustability for a drip system as lines can be adjusted throughout the season to allow farmers to use the drip lines ensure even germination of seeds, spoon feed plants nutrients without root burn, and keep drip lines in the center of the furrow to ensure even distribution of water to both of the rows. All these features will result in reducing inputs such as energy, fertilizer, and water needed to grow your crops.

Dragon-Line® systems are designed and supplied with computer generated printouts which will indicate the precise placement of drip lines on the system, the required pressure needed to ensure proper operation, the flow of each drip line, and the total length of the line itself (can range from 1 foot to 100 feet)

Step 1: Before beginning installation, you will need the following information: Flow desired for system, pipe I.D, length of the pivot spans, number of drops per tower. This information will allow you to determine the amount of drip tape needed, type of filtration to be used, size of filter & sand separators needed, number of fittings required, and will allow for the creation of a sprinkler chart and quote. A water quality analysis is also highly recommended before the installation of a new system to determine if control of bacteria will be required.

Step 2: After the quote and nozzle chart have been completed, work on the system itself can begin. The first task in installing the Hybrid system is placing the starter and end brackets on the pivot (Note, if no overhang is present then end bracket is not required, also dragon-line is not recommended to be installed 40 feet past the tower on the overhang). The starter bracket is installed on the first span near the center point and the end bracket is installed on the overhang to connect the cable to the tower termination of the first/last tower. Start this process by placing the saddle clamps around the pivot pipe and tightening with bolts. These saddle clamps should be placed in way that both the drop-down angle iron and diagonal support can be connected. Examples can be seen below



Above Shows the Starter Bracket to the left and Termination Bracket to the right. Below is the Termination bracket face out from the pivot



Step 3: (This can be done at the same time as Step 2 if you have extra crew members) Install the tower termination kits at each tower. The first step to installing a tower termination kit is to take the attached turn buckle over the pivot pipe. The other end of the tower termination kit should then be threaded through the bracket of the dual winch assembly or eyelet of turnbuckle before being wrapped around center gear motor mounting bracket. The first ¼ inch cable clamp needs to be placed above the motor mounting bracket and the second cable clam placed directly underneath where the hook of the turnbuckle and loop connect. This will keep the cable straight and allow for more movement of the dual winch up and down the tower termination. This allows the height of the dual winch to become fully adjustable. The height of the winch assembly can then be set to your preference by tightening a cable clamp underneath the bracket to hold the winch at a set height above the ground and secured by tightening a second clamp above the bracket. The final step is to take out enough cable from the winch until the hook touches the ground.



Step 4: With the two brackets and tower terminations in place a cable can now be stretched to connect the two winches/ turn buckles at each end of a span. These cables should measure the length between the tower terminations. After being cut to length, the cable should then be attached to the hook of winch by creating a loop with the cable (be sure to use two cable clamps to create stronger loop). Tighten the winches until the center of the cable is roughly 6 to 12 inches off the ground. (Note, the process can be different when connecting cable to brackets as cable can attached to a hook and chain or winch mounted directly to the bracket)



Step 5: With the cable now in place V-Jack cable hooks should be installed and attached to the cable across the systems length. The hook should rest in the V-Jack pocket or wrap around the junction of V-jack. The first V-Jack cable hook assembly in the center of the span should be installed first and set to the same desired height as the dual winches. From here the V-Jack hook assemblies should be installed from the center out to the towers to ensure the cable is evenly off the ground. The included ¼ inch cable clamps should be on either side of the cable. This will create a loop under the main cable. This loop can either be left in place or tied to the main cable with twine/zip ties etc. Once all V-Jack cable hooks are installed and clamps below the cable connecting the tower terminations are tight, it should then be stretched using the winches/ turn buckles until it is tight enough to eliminate sagging between V-Jack hook cable assemblies.



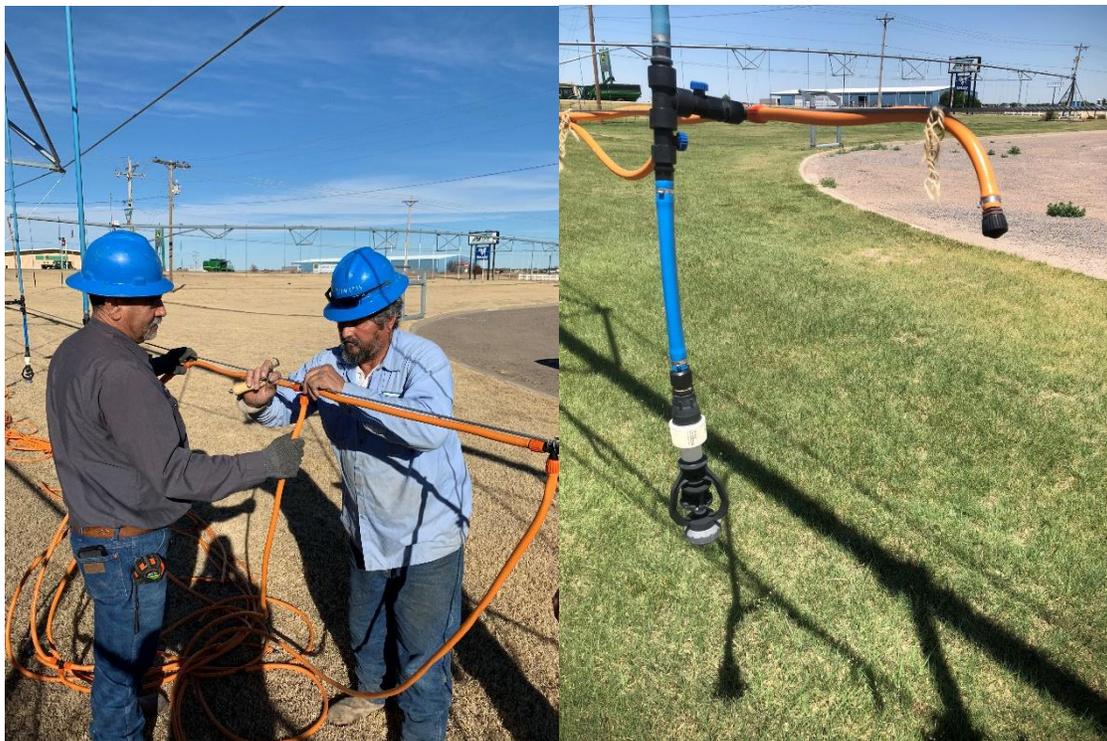
Step 6: With the cable in place, the manifolds with leader lines of Dragon Flex hose should now be unrolled and attached to the cable. Hang the manifolds to the cable loosely with wire or other device to allow for easier handling. Using the wire ties provided manifold should be tied to the cable at each tee and each adaptor tee used to feed water to manifold. Wire ties should wrap around the cable at least two to

three times before twisting them tight around the fitting. (Watch wire tying video on Dragon-Line website to see best way to attach to cable). Each wire tie should be tight to prevent slipping as this will alter spacing of drip lines.



Above you can see how the adaptor tee and tee are secured to the cable

Below: The install of the manifold and an example of the end of a manifold with a dual valve can be seen



Step 7: (This can be done at the same time as step 6 if you have extra crew members and stagger them across the system) Install dual valves and/or feeder lines into the manifold and tie adaptor tees to cable. This is done by first cutting the feeder length based on the manifold's height. After beginning a cut, a pex tool is recommended to insert $\frac{3}{4}$ inch hose barb adaptor (Note be sure to use a pinch clamp/hose clamp to prevent leaks). These adapters can then be screwed into the adaptor tee or dual valve assembly.



Step 8: Using nozzle chart provided, cut Dragon-Lines to length according to drop number and end plug can then be installed at the end of the drip line. For easier install (especially in colder weather) drip lines can be cut and end plugs can be installed in a shop to then be taken to the field. This makes install take less total time as measuring.



These steps can differ slightly depending on the setup, design, and options being used. For example, using turnbuckles instead of the optional dual winch or installation on linear move machines will differ slightly from install on a pivot. If you have questions regarding the install of your system contact your Dragon-Line dealer or you can contact us directly at 1-884-424-3724.