



The simple D.I.Y. Smart Drip System guide.



O.K. so you've decided that the only way to irrigate your garden is with a "Netafim Smart Drip System", but where do you start!

1. Water Connection:

All irrigation systems require connection to a water supply. This can be as simple as connecting a screwed fitting on to your existing garden tap or cutting into your water supply below ground. It is advisable to install an isolating valve and back-flow prevention device at this point.

- **Back-flow devices** are available in four basic types; vacuum breaker, dual check, double check and reduced pressure zone (RPZ). Vacuum breaker and dual check valves are used in most domestic installations, which are deemed to be “low risk” systems. Double check valves and reduced pressure zone devices are generally used in “medium to high risk” systems. These valves are generally used in commercial systems. A reduced pressure zone (RPZ) back-flow device must be installed when using a Techfilter. These devices are to be installed and tested by an approved installer and registered with your local water authority.



2. Head Works:

The Head works, as the name suggests, takes position at the head of the system. Connecting to your Water connection point the head works incorporates master valve, pressure reducing valve, disc-filter and Techfilter (mandatory for sub-surface installations):



- **Master valve** is a normally closed solenoid valve that opens only when irrigation takes place. It remains closed at all other times to ensure that your system does not remain pressurized when your irrigation system is not in use.
- **Disc-Filters** are installed to protect the system from blockages caused by water borne debris. Use an Arkal 120 mesh disc filter to ensure that drippers remain clean. These should be checked periodically to ensure that they remain clean and do not reduce the performance of your system.



- **Techfilters** are essentially a disc filter, which has had its disc's impregnated with Treflan. Treflan is released into the water in minute quantities and upon discharge through the drip opening forms a root barrier. This prevents the possibility of root penetration into the drip opening and is required where drip-line is to be installed sub-surface. Techfilter cartridges are to be changed every two years. Remember, whenever a Techfilter is installed you must also install a RPZ back-flow device.
- **Pressure reducing valves** are installed in all drip systems to ensure that the system operates at low pressure. Low operating pressure will ensure that the correct discharge rate of the drip is maintained and that the entire system operates below the maximum pressure rating of 300kpa. These can either be installed at the head works or individual pressure reducing valves can be installed on each station. These devices are available in either preset or adjustable forms.



3. Main Line:

The Main Line is a pressure pipe dedicated to the supply of water to your irrigation system. Main lines are generally PVC or High Density Polyethylene pipes. Minimum pressure rating is 1200kpa unless a master valve is installed at the start of the system. Run the Main Line from the Head Works through to the last valve in your system. Locate solenoid valves at an appropriate point and fit to the main line. Also provide control cable for each solenoid valve. If the Main Line is to run over changing topography or over a long distance an Air Release valve should be fitted at all high points or every 600m of Main Line.

4. Lateral Lines:

Once your solenoid valve has been fitted you can then take a sub-main off to the intended irrigated area.

- **Sub- mains** are generally L.D. polyethylene pipes. Once they reach the irrigated area they split off to form either a feed or supply manifold. Punch the appropriate sized hole into the sub-main, insert a Start Connector to the drip-line and connect to the feed manifold. Ensure that all sub-mains are pegged down to ensure that they won't move.



- **Drip-lines** are run evenly in a grid pattern over the irrigated area. Spacing of the drip-line will depend on your soil type. As a general rule free draining soil will require drip and drip-line to be spaced close together, where heavy poor draining soil will require both drips and drip-lines to be spaced further apart.

Drip-Line Spacing Guide - Turf			
Soil Type	Sand	Loam	Clay
Drip spacing	0.3m	0.4m	0.5m
Drip-line spacing	0.3m - 0.4m	0.4m – 0.5m	0.5m – 0.6m

Drip-Line Spacing Guide - Garden			
Soil Type	Sand	Loam	Clay
Drip spacing	0.3m	0.4m	0.5m
Drip-line spacing	0.3m - 1.0m*	0.4m – 1.0m*	0.5m – 1.0m*

** Drip-line spacing for garden areas can vary in distance due to the plant type and plant spacing. Smaller plants with small root zones will require closer drip-line spacing than larger plants with an expansive root zone.*

Lay drip-lines out over the prepared site. Place the drip-lines approx. 100mm in from the edge of the irrigated area. Maintain even spacing over the entire site and ensure that maximum recommended run lengths are not exceeded. Peg down drip-line to ensure that the pipe doesn't move when application of mulch or topsoil commences. For sub-surface installations your drip-line should be at least 100mm – 125mm below the lawn surface. For garden beds lay drip-line out over the soil surface and then spread mulch over the top. Drip-lines are run through from one end of the irrigated area to the other end and connected to a "collection or return manifold". On sloping ground the drip-line is run across the slope. This will ensure even water distribution along the entire length of the drip-line.



- **Air/vacuum release valves** are to be fitted to the system at the highest point of both feed and collection manifolds. Air/vacuum release valves are fitted to prevent suck back from occurring. Suck back can cause both the collapse of drip-line and the potential blockage of drip openings through dirt being drawn into the drip opening. An air/vacuum release valve will allow clean air to be drawn into the system through the valve when suck back or vacuum occurs. An air/vacuum valve will also allow for the release of air upon system start up. Install one air/vacuum release valve for every 40LPM of water flow used in your drip system.



- **Flushing valve** should be installed at the lowest point on both the feed and collection manifold. House flush valves in a valve box. Ensure that throughout installation dirt and debris are not allowed to enter the drip line. Once all lines are connected ensure that the entire system is flushed thoroughly to purge the system of any dirt or debris prior to initial use. Flush valves are available in either automatic (closes after discharging +/- 4 ltr.) or manual forms.



5. Automation:

Your system can be automated by installing solenoid valves to each irrigation zone.

- **Solenoid valves** are valves that are electrically operated when connected via control cable to a controller.



- **Irrigation Controllers** are available in either AC or DC forms. They can operate solenoid valve groups of 6, 9 and 12. Your controller can also operate your system in three different watering programs.
- **AC controllers** have an AC transformer that plugs into your power supply and reduces your voltage from 240V to 24V. Use standard 24V AC solenoid valves.
- **DC controllers** operate on a standard 9V battery, which plugs directly to the control panel. To ensure a long battery life DC controllers send out a pulse of power to the solenoid valves. You must therefore use DC Latching solenoid valves with DC controllers. The controller will send out a pulse, which latches the coil "open" and at the end of the irrigation schedule will then send out a pulse, which then closes the valve.

- **Flori Com** soil moisture sensor can be connected to your controller to ensure that your system will only operate when the soil sensor determines that the soil is dry enough to allow irrigation. It can be easily connected to the sensor input on the controller. The Flori Com soil moisture sensor has a simple dial setting which will allow you to select “dry” to “wet” soil moisture settings.



System Design:

The most important aspect of a sub-surface drip system is the systems design. Your Netafim dealer can assist you with this process however you will need to provide them with the following information:

- **Water:** You will need to determine the following:

Static pressure	
Flow rate @	150kpa
	250kpa
	350kpa
Source	Mains / Bore / Other
Quality	Clean / Dirty
- **Site:** Undertake a basic site analysis to determine the following:

Soil	Sand / Loam / Clay
Topography	Flat/Slope (% of fall)
- **Plan:** Prepare a scale drawing of the area you wish to irrigate. Make sure you put in such details like paths, trees, letter boxes etc. This information will ultimately determine the design of your system.

System Installation:

Install your system in the order that has been mentioned above – steps 1 to 5. Remember to thoroughly flush all main, sub and drip-lines thoroughly prior to first time use. Prevent debris or dirt from entering the system at all times.

System operations:

Your Netafim dealer will be able to calculate your watering needs and be able to advise you of the correct watering duration time required by your sub-surface system.

- **New lawn** will require frequent watering until the lawn is able to develop a deep root system. Overhead watering will need to supplement sub-surface irrigation for the first 3-4 weeks. Once the root system establishes itself the need to irrigate overhead will diminish. The system is now ready for less frequent but deeper watering.
- **Established lawns** with developed root systems will benefit from deep irrigation cycles. Watering schedules should be based on the weekly watering requirement for your lawn and the application rate of your sub-surface drip irrigation system.
- **New gardens** will also require frequent watering until the plants are able to develop a deep root system. As plants become established they require less frequent but longer watering schedules.
- **Established gardens** will require less frequent but longer watering.

If you require any additional information regarding the sub-surface irrigation design, installation or maintenance contact your nearest Netafim dealer or Netafim Australia on Phone: (08) 8363 9311.