

Welcome to the World of Automatic Watering



Presented by:

Irrigation Systems Company Projects Ltd.

West Lodge,
Adsdean,
Funtington,
Chichester,
Sussex PO18 9DW

E-mail: ISC@Water-It.com

Tel: 01243 575 708

Fax: 01243 573 259

Web site: www.Water-it.com





WELCOME to the WORLD OF AUTOMATIC WATERING

Wouldn't You Rather be Playing Golf?

Or sailing or fishing? Or spending quality time with the family? Or simply just relaxing in the garden that has grown from all your time and effort. Anything other than holding hose-pipes and moving little plastic sprayers around in a vain effort to keep that garden looking good, only to see it turn into a desert when you go on holiday? Then the answer is to have ISC install a custom designed automatic watering system on your garden and forget that chore forever.

those with pretensions of greatness will also have the tees and fairways automatically watered. Other famous sports locations, such as Wimbledon and Wembley are also fitted with automatic watering systems as are public areas like Marble Arch and Hyde Park Corner.

In the context of gardens and landscapes, at its most complex, an automatic watering system can comprise pop-up sprinklers, which vanish below the ground surface when not in use to water lawns and beds, drippers for containers and hanging baskets, a mist system for the greenhouse, in-ground electric control valves, buried distribution pipework and control cables, a



This booklet gives information on what an automatic watering system is, what is involved in the installation of such a system and how such a system will benefit your garden.

What is Automatic Watering?

Anyone who has been on holiday to California, Florida or Spain has come across various watering systems on the lawns and gardens of hotels, villas and private residences. They have probably also come across fully automatic watering systems but unless they were around the watered area in the small hours, probably did not realise that the systems were there.

In the UK, just about every golf course has an automatic watering system for the greens and

complex energy saving pumping system and a control computer.

At the other extreme, and considerably cheaper, an automatic watering system could comprise simple pulsating jets located in the borders to keep expensive plants alive and thriving through the summer, the jets being fed through pipe laid on the surface (but hidden in the planting,) from a simple timed valve connected by hose to a garden tap.

Between these extremes there is a system to suit every garden, every type of planting and just about every pocket.

Efficiency & Economy

Because a properly designed automatic watering system, in any of its many forms applies water evenly and at a designed rate, it is the only way that water can be applied efficiently and economically to a garden or landscape. Compared to hand watering, where the amount applied is totally haphazard, an automatic watering system is easily controlled by the adjustment of the time that the system operates. Automatic watering therefore has the potential for saving water by ensuring that it is all used effectively by the planting. Automatic watering systems also operate during the night when evaporation losses are lower.



Night time operation also suits the water supply companies in that it removes a demand on their limited capacity distribution systems from peak times to a period when demand from other users is minimal. In most areas, restrictions on hose watering imposed by the water companies are made necessary by a lack of distribution capacity rather than a lack of water resources. Automatic watering allows the water companies to sell water to gardeners, which is after all their sole objective, without overloading their distribution systems.

To help in the efficient use of water, the automatic control systems used with this type of watering



system can incorporate such features as rain-stats, which prevent operation during and after summer rains, and soil moisture sensors and monitors.

Water Sources

The most common source of water for irrigation is the potable mains system but there are other alternatives which should be investigated before a decision is made.



Under current legislation, any private householder is entitled to abstract up to 20 M³, (or 4,400 gallons,) daily, from either groundwater or aquifer resources on their property. If used on the garden, this represents sufficient capacity to meet the irrigation demand of a plot of several acres. This level of abstraction requires

no requirement for any permit from the NRA and the use of the water is not governed by any restrictions placed on normal domestic supplies. There is also no charge made for the water used.

Many older properties have existing wells which are sometimes covered up or filled in. Where no well exists, it can be economic to drill a well specifically for an automatic watering system, providing geological data is encouraging. An automatic watering system for a reasonably large garden could accept the cost of a well up to 40 M. or so deep.

Commercial users, and domestic abstractions over the above daily allowance, have to be licensed through the NRA. In most parts of the country it is unlikely that a licence would be issued for summer abstraction from a stream or river in order that a landscape can be watered. Conversely, in most areas a licence would be issued for the use of groundwater from a well, although the issuing could, under present NRA practice, take an inordinate length of time.

A small charge is levied for the water, based upon the licensed quantity, not that actually used.

Mains water is charged at a higher rate but, even on a watered area of half an acre, (so a total plot size of about an acre,) the annual charge is likely to be no more than £360.00 at current rates. It is usually necessary for the mains supply to be metered if a watering system is in use so anyone proposing to install such a system should contact their water company for advice.



Officially, garden watering systems are subject to hose-pipe bans as any water company will confirm. However, the companies appreciate the fact that night time use of the automatic watering actually reduces day-time loading on their pipework systems and allows them to sell water at a time when nobody else wants it. It is perhaps for this reason that ISC has yet to hear of one of its clients being shut down during a ban, despite the fact that all of the systems are known to their local water companies.

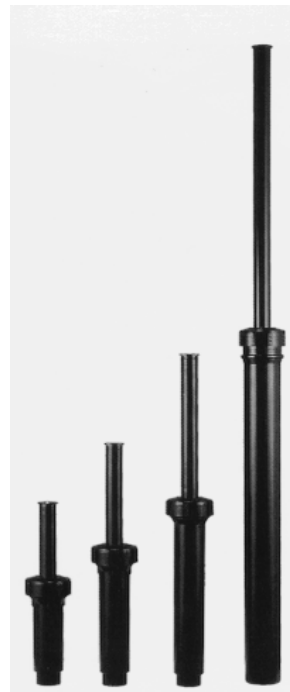
What Makes Up an Automatic Watering System

An automatic watering system is made up from a number of components, each designed to do a specific job. ISC engineer each system to suit the exact conditions of the site, selecting the equipment that is best suited to the particular installation. The choice and design is founded upon well over twenty years experience in installing and maintaining irrigation systems of all sorts in many countries around the world.

Among the variety available, the following are commonly used.

Pop-Up Sprinklers

Pop-up sprinklers are sprinklers which are set into grass or shrub areas lying flush with, or just below, ground level when not in use. When the water is switched on, the sprinkler rises so that the nozzle is clear of the ground, allowing the water to be sprayed over the designed area. When the water supply is turned off, the sprinkler drops back below ground level. On turf, heads with a rise of only 60 - 75 mm. are used whilst heads that rise up to 300 mm. are available for use on areas of shrubs and groundcovers. Various types of sprinkler are available, ranging from fixed head sprays covering only a few metres of giant rotating heads with a range of over 30 M.

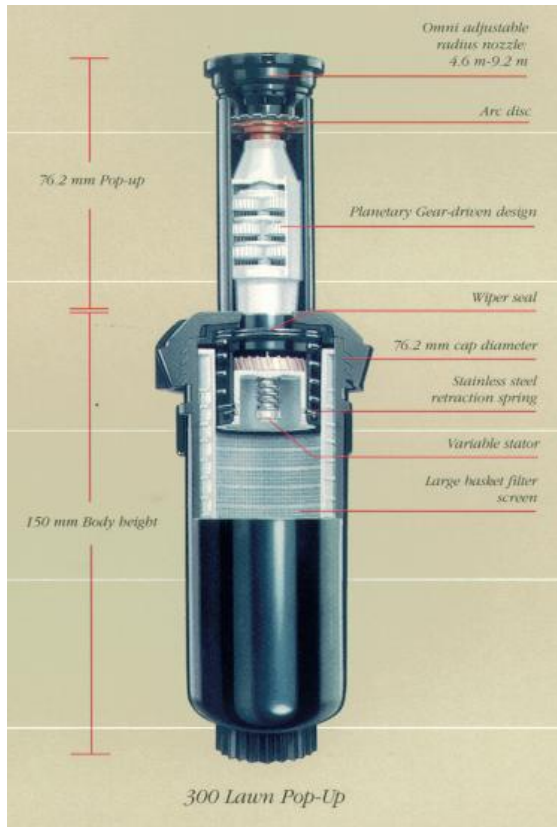


The majority of garden and landscape systems tend to use relatively small heads (ranging up to a radius of 15 M.) often of the stream spray type which, with a number of rotating jets presents an attractive, as well as effective, watering pattern. Fixed spray heads are available in odd shaped patterns, such as long narrow strips, for particular areas.

Pop-up sprinklers have been in manufacturer for a number of decades and have been proven to be exceptionally reliable. They will not interfere with the use of lawn mowers and other garden machinery and games can be played over them. Pop-up sprinklers are, in fact, installed on most major sporting locations including football grounds, cricket squares, race tracks, race courses, etc., as well as golf courses.

For very dense or mature areas, shrub-head versions are available for most types of pop-up sprinkler. These do not rise with water pressure but are mounted within the planting, where their location is not at all obvious, on fixed risers.

Pop-up sprinklers represent the best of automatic watering technology and as such, as they are fed entirely through underground pipework, they also



represent the more expensive end of the list of options available to the irrigation designer.

Micro-Sprays

Micro-sprays are small radius, low flow sprayers or spinners which are not available as pop-up heads but mounted within the planting on small bore



polythene risers. They are therefore only suitable for private gardens or landscapes where there is a high degree of security to prevent them being vandalised.

This type of spray head can be fed through pipes laid along the ground surface, but hidden within the planting, making for a very economic installation on beds or borders. They are totally un-suited for use on lawns.

A pulse jet, ultra-low flow rate version of the micro-spray is available with the advantage that the standard sized orifice and standard range can be maintained but at a low flow rate down to 2 Lit./Hr. This unit gives a very low application rate and therefore a very gentle and easily controlled precipitation and can be fed from very small bore pipes. The low flow rate (which also self-compensates for variations in pressure,) allows large areas to be irrigated from a restricted water supply.

Drip Irrigation Equipment

Drip irrigation uses point application devices called emitters which apply water at very low flow rates directly to the soil. As such, they can be used on all forms of planting except turf and, in the context of landscapes and gardens, are particularly useful for irrigating isolated containers and hanging baskets.

The emitters are usually fed through small bore polythene tubing laid on the surface and this can be a problem in areas where there is continual replanting where there is a danger of the tube being cut by garden tools.

Drip irrigation is probably the most efficient form of irrigation with minimal evaporation and application losses and the ability to apply water very evenly indeed. As there is no over-spray onto foliage, drip systems can be also used to apply fertilisers through the irrigation supply.



Another form of drip irrigation is based on tapes which incorporate the equivalent of the emitter flow path in the tape structure. The operational life of such systems is usually less than that of an emitter system, but, under certain circumstances



this type of system can be buried within the planting beds. If it is buried, care has to be taken with any maintenance tasks carried out on the bed.

The main problem with any drip irrigation system is that the flow paths through the emitter or strip are exceptionally small and so the water supply has to be filtered to a very fine degree which adds to the maintenance requirement of the systems.

Water Storage Tanks

If the water supply for an irrigation system is to be the potable mains, then it will be necessary to install a break tank or storage tank between the supply and the irrigation system in order to comply with current By-Laws and regulations. An installed irrigation system cannot be connected directly to a water main.



This requirement does not apply when a well, pond or stream is used as the water source, but if the capacity of the well is small then it may be necessary to pump it throughout the day into a tank to feed the night operating watering system.

Where a storage tank is necessary, its capacity will depend upon the relationship between the overall demand of the irrigation system, the capacity of the water supply and the peak design demand of the system.

Various types and styles of tank are available to suit budgets and the parameters of the site. Tanks can usually be located in an unobtrusive part of the garden or landscape where they can be easily hidden or disguised. In certain circumstances, where the budget allows, the tank can be buried.

Pumping Systems & Controls

Regardless of whether the water source is a well, stream, pond or a tank fed from the mains, it will be necessary to install a small pump unit to provide the pressure necessary to operate the irrigation equipment efficiently. In all but the very largest of schemes, this is likely to be a small single phase unit drawing less power than the average washing machine.

On a fully automatic system, the pump unit will be run under the command of the irrigation control panel and fed from a dedicated consumer unit with RCD protection, usually installed by ISC as part of the overall control system. The type of pump used is very quiet in operation which



means, in a domestic situation, it can be run in the middle of the night without being in the least obtrusive.

An alternative control system, utilising a small pressure vessel, can be used to give a constant supply of pressurised water, on demand, out in the garden or landscape. Thus when any hose point installed on the irrigation system is operated, the pump will automatically switch on. This can be a very useful feature as it can operate, as well as hose points, a high pressure car washing hose, a top-up to a decorative lake or water feature or even to the swimming pool, all from the irrigation supply.

On large installations such as commercial landscapes, school playing fields, etc., multiple pump sets are often used along with sophisticated



variable speed control systems. ISC designs each pump installation to suit the exact requirements of the individual site.

Distribution Pipework

It will be necessary for pipework to be laid around the garden or landscape to feed all the various sections of irrigation equipment. For simple systems on small areas this can often be laid over the surface, concealed in the planting or at the join between a wall and paving, for example, but on most larger gardens it will be necessary to bury pipework, and control cables, throughout the garden.



ISC uses plastic pipes for this, uPVC, ABS or MDPE depending upon the conditions on the site, and all manufactured to International Quality Standards.

Installing pipework through an existing landscape is a skilled job if the garden is to be put back without detriment and the installation teams of ISC employees (the company does not use self employed sub-contractors,) take all necessary precautions to avoid damage to planting and infrastructure. For example, planks will be laid across lawns to prevent making tracks with barrows, etc., and excavated trench spoil will be laid on woven polypropylene matting to prevent it getting in the surface of undisturbed turf. Good quality turf is stripped by hand and, under normal circumstances, any turf or plants disturbed are reinstated during the same working day. This does slow the work a little, but it makes for a quality job.

Irrigation Control Systems

To make the best of an irrigation system it should be operated automatically and preferably in the middle of the night when evaporation losses will be lowest and there will be no danger of scorching plant foliage. This is also the time when demand on the water distribution system is at its lowest.



A standard irrigation control system comprises low voltage solenoid operated valves installed on each section of the garden or landscape, control cables laid from those valves, with the distribution pipework, back to the controller and the irrigation controller itself. The solenoid

valves, which operate at only 24 Volts, are usually installed in small green chambers located in soft areas. Every effort is made to keep these out of lawns and amongst over hanging planting so that they remain unobtrusive. A properly installed watering system is all but invisible. Control cables are usually specified with a Hy-Tuf outer sheath so that they are not damaged if accidentally struck by garden tools.



Even the simplest controllers allow each solenoid valve to be individually timed so that variations in the type of planting, or other such factors as aspect and shading, can be taken into account in setting



the amount of water applied. For example, a fully exposed lawn on a gentle south facing slope will require more water than an area of herbaceous planting partially shaded by trees and it is important that the design of the irrigation system reflects this and that it is taken into account when setting the operating times.

Quite simple controllers can also allow each section of the garden or landscape to be assigned to either of two different irrigation cycles so that, for example, lawns may be watered once every two or three days, whilst containers and hanging baskets are watered up to three times a day. This type of facility is very helpful in making efficient use of water resources.

Controllers can be fitted with a simple rain switch which will prevent watering taking place during and immediately after any summer rain and more sophisticated soil moisture sensors can be used to measure available soil water and control the irrigation system with a view to maintaining it between certain limits. On very large systems full computer control with automatic daily updating from a dedicated weather station can be used to optimise the amount of water consumed.



Other Uses of the Watering System

The automatic watering system can be useful around the garden or landscape in other ways. As well as providing a high pressure source of water for washing down paving and other areas, the supply can be used to automatically top up pools and water features and even swimming pools.



The installation of a watering system also presents an opportunity to economically install lighting cables in the trenches taken out for the distribution pipework and ISC can also carry out this work and install lighting fittings where required.

In recent years, the problem of subsidence of building foundations, caused by contracting clay soils, has become apparent in the dry summer season. The clays contract when they dry out, either through direct evaporation or because plants, and especially trees, draw out all the soil moisture through their roots. An automatic watering system



around the property will maintain soil moisture at quite high levels to suit the planting and it can therefore be expected that any clay soils will not contract by the same amount as if the system was not installed.

event of a problem, ISC's service crews will usually be able to respond in 24 - 48 hours.

Fountains & Water Features

ISC also design and install the plant and equipment required for fountains and water features. This can include submersible and dry pumping systems, normal and biological filters, disinfection systems using chemicals or ultra-violet light, aeration equipment and pool conditioning systems, etc., as well as the nozzles and pipework designed to create the desired display.



Control systems are also designed and installed and these can simply operate the fountain on a time basis and bring in the water conditioning system for part of the cycle, or they can carry out more complex tasks such as to modulate the height of the fountain in high winds

and on to functions that will even make the display respond to the approach of people.

The company also designs and install pool feature lighting so that the fountain can be view properly at night.

Water features can be designed to achieve almost any desired effect, the only limitations being the imagination of the client and designer and, of course, the budget.

Service & Maintenance

All ISC installation are installed by our own fully employed crews. Almost uniquely in the irrigation industry, ISC does not use self-employed sub-contractors to do the work. Therefore, ISC installed automatic watering systems tend to be very reliable but, like all mechanical and electrical equipment, they should be maintained properly. ISC offers a maintenance contract to all its clients which covers a winterisation process and the spring start-up.

Outside these times, it has been found that very little maintenance is required but, in the unlikely





The Next Steps

If what you have read here has created an interest in automatic watering, which we hope it has, the next step would be to call ISC (Telephone 01243 575 708, or fax 01243 573 259) and discuss with one of our engineers your requirements, gardens or landscape and budget. They will be able to advise on matters relating to water sources and can arrange to visit the landscape or garden in order to assess the actual requirements.

If detailed drawings do not exist, ISC's engineers will survey the landscape in order that a proper and accurate irrigation design can be prepared. Once that has been done, a formal offer will be made for the design and installation of the system. It will take about two weeks to proceed from the first contact to the offer.

When the offer has been accepted, a timetable for the installation will be agreed and, subject only to weather conditions (if it gets too wet, work will have to stop,) the system will be installed and commissioned to that programme and the client, or his staff, will be instructed in the use of the equipment.

ISC will then look after the system under contract.

The telephone number is, again, **01243 575 708**.



maturing as fast as possible, protecting the time and investment made in the garden.

Although most keen gardeners are not concerned with matters such as economic rate of return, if it is accepted that gardens add to property value, then it is obvious that automatic watering systems add to the value of the garden.



Remember

An automatic watering system is the only way you can ensure that your garden stays in pristine condition throughout the summer whilst keeping water use to a minimum, minimising inconvenience by operating at night and eliminating the chore of hand watering. It is the only way to keep the garden, patio, baskets and planters watered whilst away or on holiday: without employing a gardener to do it, with all the cost and inefficiency that that involves. Automatic watering will help establish expensive new plants and get new landscapes and gardens growing and





MISSION STATEMENT

ISC's Mission Statement is quite simple: To be the **BEST** landscape irrigation company in the UK, and beyond, with the best standards of engineering design, installation and service.

COMPANY BACKGROUND

The company was started by Steve Usher in December 1975, so has now been in existence under the same management for over twenty-five years. During that time, it has worked in all aspects of irrigation throughout the UK and in around one hundred countries all over the World. Initially, the company concentrated on design work operating as a Partnership but soon set up an associated contracting company to design, build and maintain irrigation systems. Both companies are still operating and both have one very big advantage over most other irrigation companies: they are independent of ties to hardware manufacturers. That means that irrigation designs are carried out from the viewpoint of individual client's requirements, not as a way of selling products from a limited catalogue. It does not matter whether the company is designing a system for a golf course in southern Europe, installing a major landscape system in the UK, specifying and supplying a farm system in Kenya or looking at the feasibility of greenhouse production in the USA, all work is tailored to the client's needs only.

The scope of works carried out has been extensive and has included:

Agricultural Irrigation
Horticultural Irrigation
Landscape and Garden Irrigation
Recreational Irrigation
Golf Course Irrigation
Fountain and Cascade Systems
Greenhouse Developments
Micro-Propagation Facilities
Agricultural and Horticultural
Project Development
Mushroom & Sprout Cultivation
Water and Sewage Treatment for
Irrigation Use
Compost Production
Forestry Establishment
Environmental Impact Studies



All in all, irrigation can be tailored by Irrigation Systems to any conceivable landscape with only two limitations: budget and imagination!