

Bowling Green Irrigation



**Access Irrigation Guide to
Bowling Green Irrigation**

Guide to Bowling Green Irrigation

	Page
• Contents	
• Company profile	3
• Introduction	4
• Manual system	5
• Semi-automatic system	6
• Automatic system	7
• Technical Information	8-9
• Guide prices	10
• Drawings	11-13



Access Irrigation has been involved with designing and installing irrigation systems for over 30 years. Many of these projects involve irrigation systems for the sports industry from Football and Cricket clubs to Bowls clubs.

As irrigation is a specialist subject and in a sports environment vital to ensure the enjoyment of players and spectators alike. We thought we would produce a booklet aimed specifically at the needs of Groundskeepers, landscapers and anyone who has the responsibility for maintaining a clubs biggest asset.

This booklet covers Bowling Greens, along with information on the basics of an irrigation design and current water regulations.

As a company Access Irrigation can provide specialist advice and detailed costs for each project along with full specifications for the client. Where funding is being sought Access can provide basic costing and technical details to aid the process, along with tender specifications if required.

We do hope that you will find this guide helpful. Our website is packed with helpful information including specific product information all downloadable and an on-line shop where new and replacement parts can be purchased directly. Look out for our SPORTS section on the website and in our catalogue.

If you have any comments on the guide or would like any advice on any existing or proposed irrigation projects, please give me or any of our sales team a call.

Regards

A handwritten signature in black ink that reads "M. Briley".

Mike Briley

Sales Director

Access Irrigation Ltd
Crick
NORTHAMPTON
NN6 7XS

Tel: (01788) 823811
Fax: (01788) 824256
sales@access-irrigation.co.uk
www.access-irrigation.co.uk

Bowling Green Watering



Introduction

The heart of any bowls club is the 'Green'. As no two greens are the same it's this uniqueness which determines the enjoyment and challenge of the game.

Unlike other field sports where the play is sporadic across the grass area, the bowling green is used as a rolling surface. This means that any irregularities and unevenness are extenuated. Apart from the obvious factors like length of cut and hardness of surface, frequency and rate of watering can also determine how the green 'plays'.

The Greenkeeper has the unenviable task of keeping it in peak condition, feeding, scarifying, mowing, aerating. As most bowls clubs don't have the luxury of a full time Greenkeeper this all has to be done in a limited time scale. So having a suitable irrigation system will help cut down on one job at least.

Leaving the green to totally dry out or scorch is not always a good idea for long term playability, so a properly thought out watering solution needs to be in place ready for action. It is better to water once or twice a week and apply a good amount of water. The green will lose on average 21mm per week during peak season so this amount will need to be replaced.

Whichever system is chosen, some additional spot watering may be needed as inevitably some areas dry out quicker than others or may be even be Hydrophobic. So it is a good idea to have the equipment to do this should it be necessary.

If the budget is limited and a mains water supply is the only option, it is a good idea to find out exactly what flow and pressure is available. Then you can select or design a suitable system around this. We have designed some standard kits to ease the selection process but we can always adapt or design something specifically for you.

The following pages detail the most common types of Green watering systems. If you would like to discuss your requirement with us you can contact us on phone or email.

We look forward to your call.

Manual system



Mobile watering kit



Sprinklers in action

A simple and low cost method of providing the water required is to use mobile sprinklers. These consist of lightweight metal bases fitted with 360° sprinkler heads, linked together with flexible hose. A simple 'Geka' twist lock fitting enables easy coupling and decoupling of each unit.

To cover the Green in as few moves as possible without outstripping the available water supply is the key. A standard off the shelf kit is available, designed to provide watering where required and sized to operate directly from an average mains water supply, saving on the cost of an additional pump and water storage tank.

Sprinkler unit

The standard sprinkler head covers a diameter of 19m and is mounted on a robust metal sled base. This design gives stability in operation and also enables them to be dragged across the green whilst still coupled for easy retrieval or repositioning without damaging the green surface.

The system is easy to store, simply disconnect the linking hoses from the individual sprinkler units. Couple the hoses together and coil up. A hose trolley can be added to help with this and the sprinkler bases can then be collected and stored separately.

Setting up

A row of 3 standard type sprinklers spaced 13m apart will span the width of the green and cover an 11.8m strip effectively. To set up, simply position the first base at 6.5m from the edge and 8.5m from the side edge, pace the next base 13m from the first then repeat for the last base. When watering has finished in this first position move all bases 11.8m from the original base line position.

A weeks amount of water (21mm) is usually applied at each position. This equates to a run time of approximately 9hrs. A green can be fully covered in around 2-4days depending upon the operating window.

Water supply requirements

- 3no sprinklers would require 1080l/h flow and 2.5 bar pressure at sprinkler head.
- Individual 2-4 bar at 360L/H

For prices and drawing see drawing reference 5103



Medium Walking Sprinkler
Sprinkler in action



A travelling sprinkler system can provide an easy way of watering a pitch without being too too labour intensive. The sprinkler tractor is made of a heavy duty steel construction and has a 3 wheel design to give stability when operating. The fitted sprinkler head covers a diameter of 15m which means the unit can cover the green with three passes. The sprinkler will apply between 9-18mm per setting depending on the operating speed

Setting up

The tractor unit is positioned at one end of the green, connected to the water supply via flexible hose. The sprinkler uses water pressure to power itself and follows the path of the hose. Total run time would depend upon pressure but on average would be around 4 hours. A timer is required to turn the sprinkler off at the end of its run.

Water supply requirements

As the water supply is not only providing the watering but also mechanically moving the tractor unit, a higher pressure of 4 bar with a flow of around 1200 l/h is required. This is beyond the range of most mains water supplies therefore a separate water storage tank and booster pump would be required.

Advantages

The advantage with this system is the ease of set up. The initial cost is not excessive and the tractor can be used to provide water to several bowling greens.

For prices and drawing see drawing ref 5102

Automatic System



An integrated popup sprinkler system gives the ultimate in bowling green watering.

The green will be covered by four half circle Rainbird 950E or Toro DT 35/55 sprinklers located at the centre of each edge of the green. The sprinklers are operated independently by built in solenoid valves. Because of the efficient sprinkler coverage the total running time is only around 40 minutes.

The heart of the system is the irrigation controller, a sophisticated mains powered unit manufactured by Heron, who are world leaders in irrigation control. The exact controller type is dependant upon individual preferences and required options.

To make the system fully weather sensitive, a rain sensor is included. This unit interfaces with the controller, measuring rainfall over a 24 hour period and displaying the value on screen. Three trigger points may be set, to reduce the watering times by 25%, 50% or 100% after a pre-determined level of rainfall. The rain sensor does not affect manual operation of the irrigation program.

Water supply requirements

A pressure of 7.0 bar and a flow of around 9m³/hour is required. The water and flow required mean the supply cannot be taken directly from the mains. The pressurised supply to the system would be provided by a quiet running, vertical, multi stage pump and a separate storage tank would be required.

Advantages

The major advantage with this system is the lack of user input, once set, the system literally takes care of itself even compensating for prevailing weather conditions. The system is also unobtrusive with no unsightly hoses or sprinklers in view.

For prices and drawing see drawing ref 5101

Technical information

The following is a selection of typical system components. These are intended as a guide only and components may vary according to specific systems supplied. Additional product information is available to download from our website.

Controller

For integrated systems a 230v ac controller is used. Manufactured by Heron, one of the country's leading manufacturers. The unit has a clear digital display and is easily programmed to give a timed operation daily, weekly or, if operating an external area, as weather conditions dictate. Individual watering times or suspension for each zone can also be entered. The unit requires a 230v ac power supply usually a 3 pin socket is sufficient. The unit in standard form needs to be located in a clean dry covered area, however there is an option of a weatherproof controller enclosure if required.



A signal cable needs to run from the controller position to each of the solenoid valve locations. This operates at a safe 24v ac voltage.

If a weather sensor is specified a signal cable needs to run from the controller position to the sensor location.

Pump

The pressurised water supply to the system, if not taken from the mains, would usually be provided by a 230v ac single phase pump. The pump would be sized according to the system requirements. Connected directly to the water storage tank, it would be operated via an irrigation controller.

The pump can be surface mounted or submersible (inside the tank) depending upon specific system requirements.

If the pump is surface mounted it needs to be protected from the elements.



Water storage tank

To comply with Water Supply (Water Fittings) Regulations 1999, a break tank is usually included in the system. The tank provides a Type AB air gap to prevent back-syphonage into the public mains.

The tank will be sized according to the specific situation. A surface or subsurface tank can be used. For surface tanks the tank is made from either sectional steel or black MDPE, to reduce visual impact, and has a 2 year guarantee. The tank is usually circular and needs to be sited on a firm level base, at least 0.6m larger in diameter than the diameter of the tank. A floating level switch is fitted in the tank, to protect the pump against running dry.



A mains water supply will be required to supply the tank. The water supply needs to be in the region of 1200l/h at 1-2 bar pressure.

If required, a rainwater harvesting system can also be incorporated in the system.

Warranty

All materials and workmanship are guaranteed for twelve months from date of invoice.

The limitation of liability due to failure of goods shall be limited to the value of the goods and Access Irrigation shall have no liability whatsoever for loss or damage of any sort suffered by the customer or any third party.

Permissions required

If water is being drawn from the public main it is a legal requirement that, before installation of the system can begin, the local Water Company be informed.

Legionnaires Disease

It is the responsibility of the user of the irrigation system / equipment to satisfy themselves that they have taken every precaution against airborne contaminated water droplets (Legionnaires Disease) when using the system. Information on Legionnaires Disease can be found on the Health and Safety Executive website, in Document L8: 'Approved Code of Practice (AcoP) Control of Legionnaires Disease and Management in Water Systems'.



Bowling Green Watering

Drawing Ref: 5101	Description: Fully automated, pop-up system, with 4 valve-in-head sprinklers and 200m of 50mm supply pipe. Guide price includes pump and 5000l tank, with automatic controls and rain sensor. Price for installation available on request.	Guide Price £9100
Drawing Ref: 5102	Description: Medium sized travelling sprinkler with 50m of hose, and three underground take off points supplied via 50m of 50mm underground supply pipe. Control system comprises of an automatic controller with 5000l tank and pump. Price for installation available on request.	Guide Price £4000
Drawing Ref: 5103	Description: Portable sprinkler system includes x3 Naan 5022U sprinklers on sled risers, with 50m 3/4" hose, and fittings. Requires 1080 l/h at 3 bar.	Guide Price £280
Drawing Ref:	Description:	Guide Price £



Bowling Green Watering

Drawing Ref:

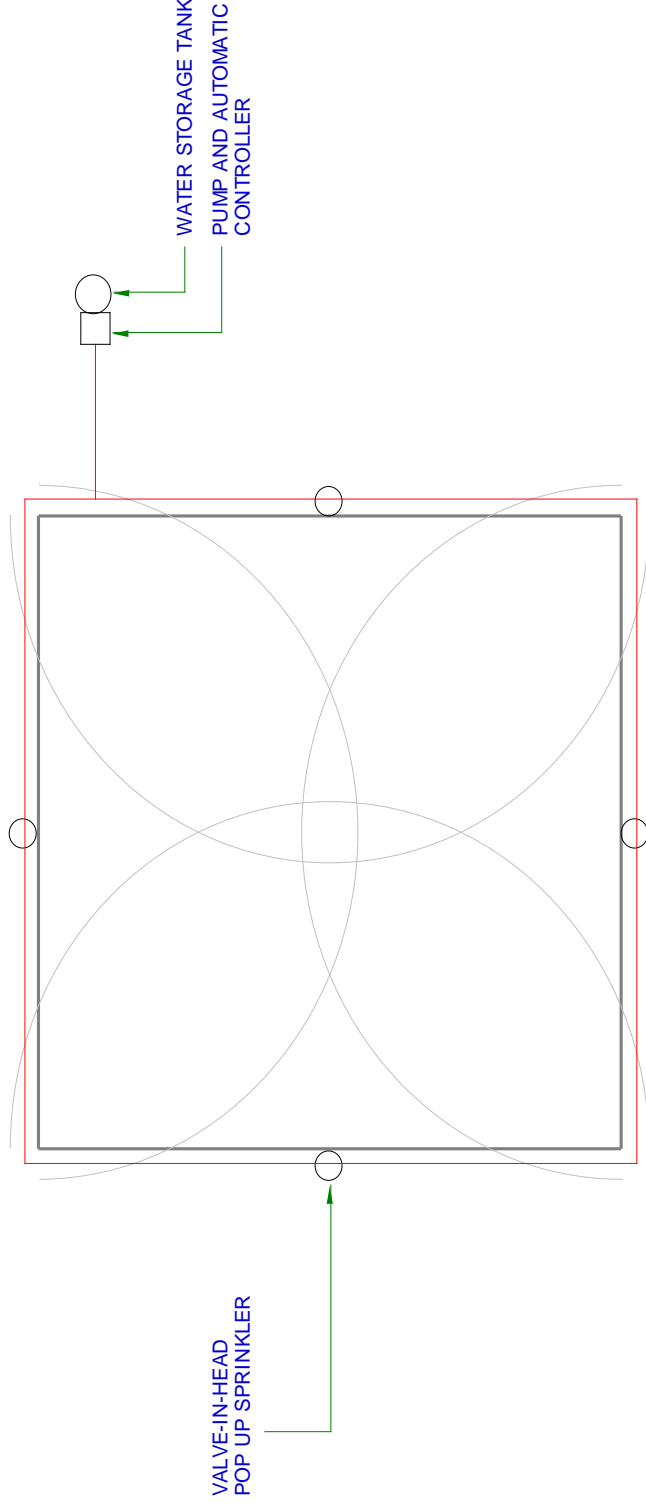
5101

Notes:

Crick, Northampton NN6 7XS
01788 823811
sales@access-irrigation.co.uk
www.access-irrigation.co.uk

Design and pricing guides/Bowling green watering

TYPICAL POP UP SPRINKLER SYSTEM FOR BOWLING GREEN





Bowling Green Watering

Drawing Ref:

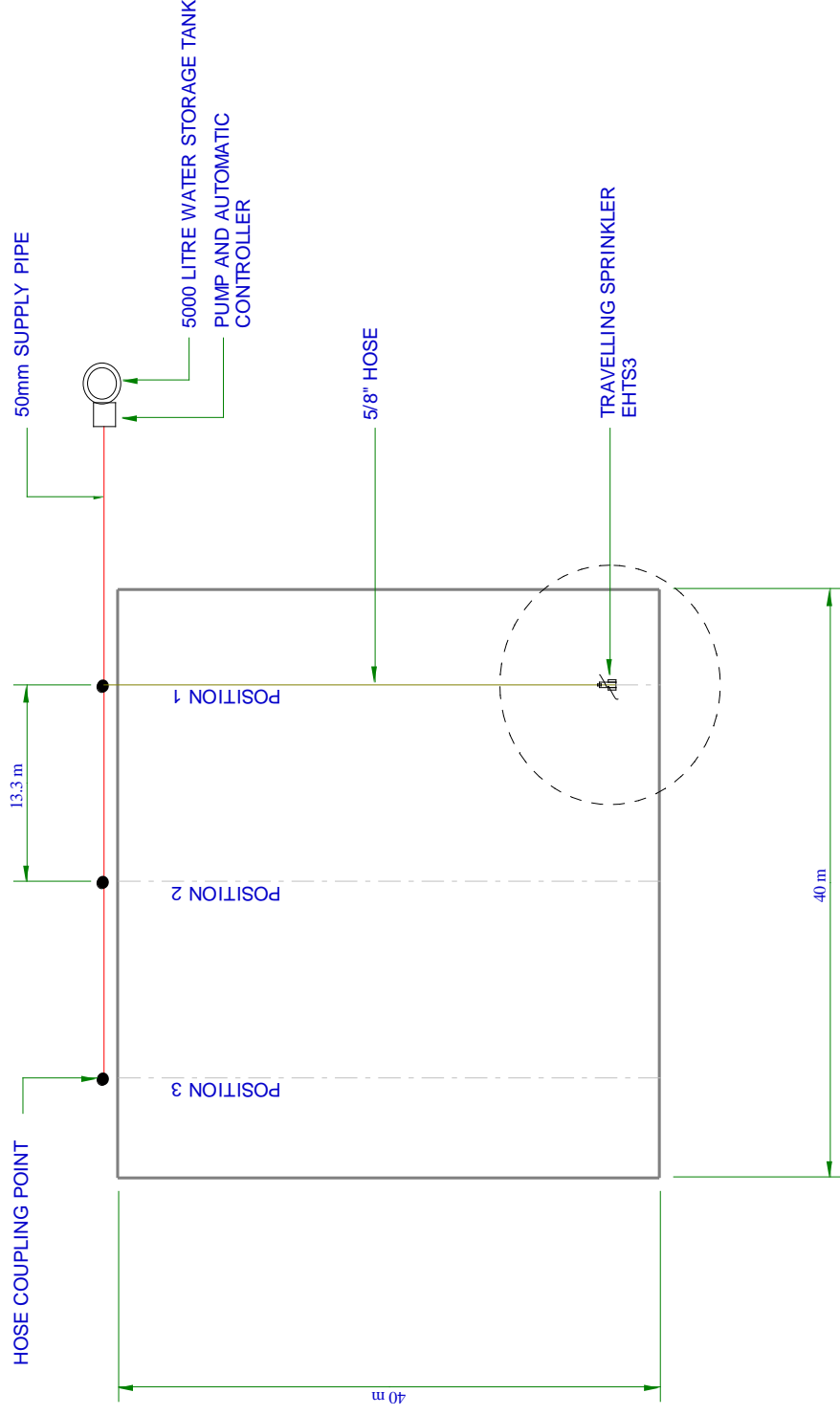
5102

Notes:

Crick, Northampton NN6 7XS
01788 823811
sales@access-irrigation.co.uk
www.access-irrigation.co.uk

Design and pricing guides/Bowling green watering

TRAVELLING SPRINKLER SYSTEM FOR BOWLING GREEN





Bowling Green Watering

Drawing Ref:

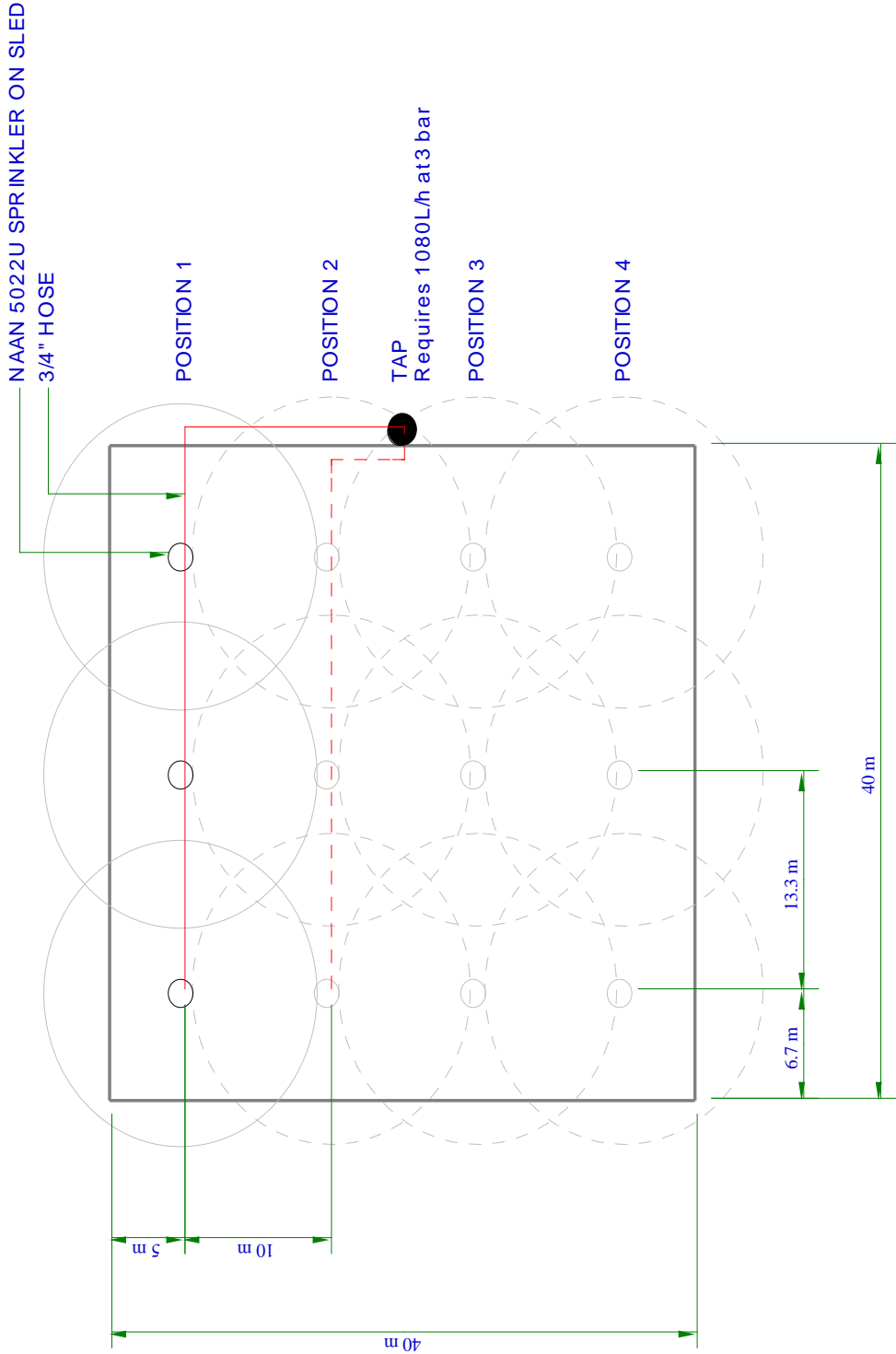
5103

Notes:

Crick, Northampton NN6 7XS
01788 823811
sales@access-irrigation.co.uk
www.access-irrigation.co.uk

Design and pricing guides/Bowling green watering

PORTABLE SPRINKLER SYSTEM FOR BOWLING GREEN



Heron

Multi-Wire Irrigation Controller



**The most
comprehensive
range of
features in the
marketplace.**

A versatile irrigation controller for
horticulture, landscape and
agriculture.



Heron
Electric

Why the Heron Multi Wire Controller?

- A superb range of software features enable you to customise the controller to match the exact needs of each installation.
- Create irrigation programs, turning any valve in any order.
- Run up to 6 valves in parallel.
- Option to operate your controller from a PC or a mobile phone
- Integrate with sensors and dosing systems...
- Unique lightning surge suppression feature utilizing optical technology built in to all controllers.
- Battery powered versions available.

Controller Sizes

The Heron M range of multi wire controllers operates from 4 to 144 valves

Controller sizes are available for 4, 8, 12 or 16 valves

The M1-144 irrigation controllers 16 valves use standard but can be upgraded to support 124 valves using expansion boxes and additional output cards. Every expansion box can accommodate four 16 valve output cards



Choose How You Want to Work

To give you a true degree of flexibility in how you work, Heron's M range of irrigation controllers can be operated as standalone controllers, from a PC or via a mobile phone.



Easy To Use

The large display and "menu driven operation" of the Heron multi wire controllers makes them intuitive and easy to use.



To simplify the creation of irrigation programs the valves can be individually named. Irrigation programs can be completely customised, allowing the user to change the valve order, add and delete valves.



Tailor Your Controller to Meet Your Needs

Because every site is different, Heron irrigation controllers can be configured to match the needs of each installation. You can specify the number of programs, the type and number of customizations needed. You can enable or disable the software features required.



PC Operation

Using Heron's "Ground Control" software you can generate irrigation programs and operate your irrigation system from a PC. Controllers can be directly connected to your PC or dialled up remotely.

All the functions on the irrigation controller can be operated from the PC.

The software includes a number of functions to help you reduce costs through water budgeting.

Simply select the features you want from a list of options. The features will then appear in the controller's Main Menu for you to use.



Complete Control

M controllers can be integrated with sensors and dosing systems

Irrigation can be controlled by light, rain, temperature, humidity, wind speed, wind direction or flow meters.

For example, your M controller can be set up to:

- Operate an existing irrigation program initiated by light and humidity.
- The existing irrigation program can be set to take priority over outside irrigation programs
- The outside irrigation can be compared to reduce based on rain fall.



Irrigation programs can be automatically generated to optimise water usage. Estimated water usage is calculated. Actual water usage can be reported.

"Ground Control" also available with a full graphical drawing facility enabling you to draw a realistic picture of your installation. You can operate your irrigation system, or view historical data by simply clicking on the picture.



Heron controllers can also be connected to Heron's ferti-liser and dosing systems. Up to 4 -liser dosing systems can be connected to one irrigation controller.

Alternatively Heron controllers can be used to control the dosing of fertiliser on a proportional basis using two flow meters. One flow meter measuring the irrigation flow and the other measuring fertiliser flow.

By adding an additional output card M controllers can also operate backflush valves or be used for frost protection

No Mains Power

Heron multi wire battery powered controllers provide an ideal solution for the irrigation of remote areas or farms or nurseries where there is no mains electrical power

- The lightning bolt-hold version can be powered from a small solar panel.
- The controllers are available in two sizes. The M1-33 operates up to 8 irrigation valves, the M1-B16 operates 16 irrigation valves.



Mobile Phone Operation

Take advantage of the mobile phone network to operate your controller.

Use your mobile phone as a remote control to start a valve, a program, or a pump. Receive a text message from your controller should an alarm condition arise.

In built security prevents unauthorized mobile phones from dialling up.

Irrigation Program Features

- Up to 60 independent programs.
- Run up to 6 valves in parallel as standard
- Possibility to run up to 12 valves in parallel with additional output cards.
- Up to 64 automatic starts.
- Daily, weekly and variable period automatic starts.
- Automatic starts can be set to run on odd or even days.
- Valves can be individually named e.g. Lawn1, Bed1.
- Valves can be specified to run on a time or volume basis.
- Valves can be allocated to one of five water meters.
- An optimal flow can be entered for every valve.
- A minimum, maximum and pipe break flow rate can be specified for each water meter.
- Valve times can be set from a minimum of 1 second to 10 hours.
- Valves can be allocated to an irrigation group.
- Rainfall can be monitored over 1 to 4 days, irrigation programs can be reduced by 25%, 50%, 75% or 100%.
- Manually percentage adjust (0% to 250%) .
- Separate manual percentage adjust for programs and valve groups.
- Continual cycling of irrigation programs between specified time of day. Delay between cycles can be set from 1 minute to 9 hours.
- Manually start an individual program or valve.
- Manually start multiple programs.
- User can select which program to stop or manually advance if multiple programs are running.
- Pump pressurisation time can be set in minutes and seconds.
- Programs can be configured to start, stop, freeze or manually advance on a remote input.
- Up to 10 remote inputs can be connected.
- Programs can be allocated up to 5 pump starts or master valves.
- Valves can be defined as 'special outputs' to control external devices e.g. fill a pond, switch lighting.
- Valves can be defined for back flush use.
- Irrigation programs can be inhibited by wind speed or wind direction.
- Programs can be integrated with light, rain, humidity, temperature sensors.
- Irrigation can be controlled from a calculated evapotranspiration (ET) value. The ET value can be calculated using a variety of sensors depending upon the required accuracy.
- Programs can be attached to a dosing recipe.

Hardware Features

Unit G15,
Rudford Industrial Estate,
Arundel,
West Sussex
ENGLAND
BN18 0BD

- Compatible with any 24V AC solenoid valve.
- Option to operate DC valves.
- Output current 1.2 Amps (resistive) with electronic overload cut-out.
- Output current is measured which can be displayed for diagnostic purposes.
- Two pump start outputs.
- Three digital inputs.
- One socket to connect additional cards.
- Two sockets for connecting additional output-boxes (MI-144 only).
- One data connector to connect PC and GSM mobile phone module.
- Designed to operate in an industrial environment. High electrical noise immunity, can withstand a 2.5KV spike.
- Battery backed up real time clock. Real time clock immune to high electrical noise.
- All outputs protected against electrical surges exceeding ANSI C62 surge suppression standards.
- Lockable outdoor steel enclosure version available.

www.heron-electric.com

E-mail: **sales@heron-electric.com**

Phone: Int. 44 1903 724343

Heron
E l e c t r i c

EAGLE™ 900 Series

SPECIFICATIONS

Radius: 63' to 97' (19.2 m to 29.6 m)

Flow Rate: 21.4 to 57.1 gpm
(1.35 to 3.60 l/s) (4.85 to 12.97 m³/h)

Arc: Full-circle, 360°

Models:

Full-Circle:

- EAGLE 900E: Electric
- EAGLE 900 IC: Integrated Control
- EAGLE 900S/H: Combined use Stopmatic (SAM) or Hydraulic (N.O.)*

Maximum Inlet Pressure:

Models 900E/IC: 150 psi (10.3 bars)
Models 900S/H: 100 psi (6.9 bars)

Pressure Regulation Range:

60 to 100 psi (4.1 to 6.9 bars)

Factory Pressure Settings:

900E/IC and 950E/IC available in 70 and 80 psi
(4.8 and 5.5 bars)

Dimensions:

Body Height: 13.4" (34.0 cm)

Pop-Up Height to Mid-Nozzle: 2.25" (5.7 cm)

Top Diameter: 7" (17.8 cm)

Nozzle Trajectory: 25°

Inlet Threads: 1.5" (3.8 cm) (15/21) ACME
Female Threaded

Holdback: SAM/Hydraulic 15' (4.6 m) elevation

Rotation Time: 360° in ≤ 240 seconds;
210 seconds nominally

Maximum Stream Height: 20' (6.1 m)

Solenoid: 24 VAC solenoid power requirement:

0.41 amp inrush current (9.8 VA); 60 cycle: 0.25 amp
holding current (6.0 VA); 50 cycle: 0.32 amp holding
current (7.7 VA).

Surge Resistance: Up to 20KV standard on
electric models

Top-Serviceable Rock Screen™ and Replaceable Valve
Seat: All 900 and 950 models

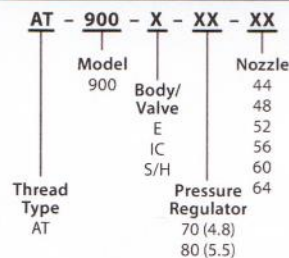
All data is generated from tests conducted in accordance with
ASAE Standard S398.1 for at least 30 minutes in zero-wind
conditions. Rain Bird recommends the use of SPACE for Windows,[®]
equivalent program or derived performance data to optimize
nozzle selection.

* N.O. — Normally open



● EAGLE™ 900 Series

HOW TO SPECIFY



EAGLE 900 SERIES PERFORMANCE DATA — U.S.

HIGH PERFORMANCE NOZZLES

Base Pressure (psi)	#44 BLUE		#48 YELLOW		#52 ORANGE		#56 GREEN		#60 BLACK		#64 RED	
	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)
60	63	21.4	73	28.9	75	31.9	—	—	—	—	—	—
70	67	23.5	73	31.9	79	34.6	83	40.7	87	43.2	91	47.2
80	71	24.7	75	34.1	81	37.1	85	43.5	91	46.4	93	51.0
90	71	26.5	77	35.0	81	39.5	87	46.4	91	49.5	95	54.0
100	73	27.9	77	36.2	83	41.8	89	49.1	91	52.2	97	57.1

EAGLE 900 SERIES PERFORMANCE DATA — METRIC

HIGH PERFORMANCE NOZZLES

Base Pressure (bars)	#44 BLUE			#48 YELLOW			#52 ORANGE			#56 GREEN			#60 BLACK			#64 RED		
	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)
4.1	19.2	1.35	4.85	22.3	1.82	6.56	22.9	2.01	7.25	—	—	—	—	—	—	—	—	—
4.5	19.8	1.42	5.11	22.3	1.89	6.81	23.5	2.10	7.57	25.0	2.48	8.94	26.2	2.63	9.47	27.4	2.88	10.35
5.0	20.7	1.50	5.40	22.4	2.00	7.22	24.2	2.22	8.00	25.5	2.61	9.40	26.8	2.78	10.00	27.9	3.04	10.94
5.5	21.6	1.55	5.59	22.8	2.14	7.72	24.7	2.34	8.41	25.9	2.74	9.87	27.7	2.92	10.52	28.3	3.21	11.56
6.0	21.6	1.64	5.90	23.3	2.19	7.88	24.7	2.45	8.81	26.3	2.87	10.34	27.7	3.20	11.86	28.8	3.35	12.06
6.5	21.9	1.71	6.16	23.5	2.24	8.06	24.9	2.55	9.19	26.8	3.00	10.80	27.7	3.20	11.86	29.2	3.49	12.57
6.9	22.3	1.76	6.35	23.5	2.28	8.22	25.3	2.64	9.49	27.1	3.10	11.15	27.7	3.29	11.86	29.6	3.60	12.97

EAGLE™ 950 Series

SPECIFICATIONS

Radius: 70' to 92' (21.3 m to 28.0 m)

Flow Rate: 19.5 to 59.4 gpm
(1.23 to 3.75 l/s) (4.43 to 13.49 m³)

Arc: 40° to 345°

Models:

Part-Circle:

EAGLE 950E: Electric

✓ EAGLE 950 IC: Integrated Control

EAGLE 950S/H: Combined use Stopmatic (SAM) or Hydraulic (N.O.)*

Maximum Inlet Pressure:

Models 950E/IC: 150 psi (10.3 bars)

Models 950S/H: 100 psi (6.9 bars)

Pressure Regulation Range:

60 to 100 psi (4.1 to 6.9 bars)

Factory Pressure Settings:

900E/IC and 950E/IC available in 70 and 80 psi (4.8 and 5.5 bars)

Dimensions:

Body Height: 13.4" (34.0 cm)

Pop-Up Height to Mid-Nozzle: 2.25" (5.7 cm)

Top Diameter: 7" (17.8 cm)

Nozzle Trajectory: 25°

Inlet Threads: 1.5" (3.8 cm) (15/21) ACME

Female Threaded

Holdback: SAM/Hydraulic 15' (4.6 m) elevation

Rotation Time: 180° in ≤ 120 seconds;
105 seconds nominally

Maximum Stream Height: 20' (6.1 m)

Solenoid: 24 VAC solenoid power requirement:

0.41 amp inrush current (9.8 VA); **60 cycle:** 0.25 amp holding current (6.0 VA); **50 cycle:** 0.32 amp holding current (7.7 VA).

Surge Resistance: Up to 20KV standard on electric models

Top-Serviceable Rock Screen™ and Replaceable Valve Seat: All 900 and 950 models

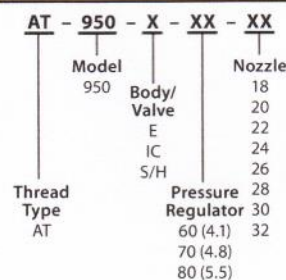
All data is generated from tests conducted in accordance with ASAE Standard S398.1 for at least 30 minutes in zero-wind conditions. Rain Bird recommends the use of SPACE for Windows®, equivalent program or derived performance data to optimize nozzle selection.

* N.O. — Normally open



● EAGLE™ 950 Series

HOW TO SPECIFY



EAGLE 950 SERIES PERFORMANCE DATA — U.S.

nozzles

Base Pressure (psi)	#18 WHITE-C		#20 GRAY-C		#22 BLUE-C		#24 YELLOW-C		#26 ORANGE		#28 GREEN		#30 BLACK		#32 BROWN	
	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)	Radius (ft)	Flow (gpm)
60	70	19.5	72	23.0	74	26.5	76	30.8	78	36.0	—	—	—	—	—	—
70	72	21.3	74	25.1	76	28.8	80	33.5	82	38.7	84	42.9	84	47.3	84	50.4
80	74	22.9	76	27.0	80	30.9	84	36.0	84	41.5	86	47.3	86	50.4	85	53.1
90	75	24.4	78	28.7	82	32.9	88	38.4	86	43.4	89	48.5	90	52.9	88	55.6
100	76	25.8	80	30.5	84	34.6	90	40.5	88	46.7	91	52.2	92	55.8	92	59.4

EAGLE 950 SERIES PERFORMANCE DATA — METRIC

NOZZLES

Base Pressure (bars)	#18 WHITE-C			#20 GRAY-C			#22 BLUE-C			#24 YELLOW-C			#26 ORANGE			#28 GREEN			#30 BLACK			#32 BROWN		
	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)	Radius (m)	Flow (l/s)	Flow (m³/h)
4.1	21.3	1.23	4.43	21.9	1.45	5.22	22.6	1.67	6.02	23.2	1.94	7.00	23.8	2.27	8.18	—	—	—	—	—	—	—	—	—
4.5	21.7	1.29	4.64	22.3	1.52	5.48	22.9	1.75	6.29	23.8	2.03	7.32	24.4	2.36	8.50	25.2	2.62	9.44	25.2	2.90	—	25.3	3.10	11.17
5.0	22.1	1.37	4.93	22.7	1.61	5.81	23.5	1.85	6.66	24.7	2.15	7.75	25.1	2.49	8.95	25.8	2.78	10.00	25.8	3.03	10.92	25.7	3.22	11.60
5.5	22.5	1.44	5.19	23.2	1.70	6.12	24.4	1.95	7.01	25.6	2.27	8.16	25.6	2.61	9.41	26.2	2.98	10.72	26.2	3.18	11.43	25.9	3.35	12.05
6.0	22.8	1.51	5.44	23.6	1.78	6.40	24.8	2.04	7.34	26.5	2.38	8.56	26.0	2.70	9.73	26.9	3.04	10.93	27.1	3.29	11.85	26.6	3.46	12.46
6.5	23.0	1.58	5.68	24.0	1.86	6.69	25.3	2.12	7.64	27.1	2.48	8.93	26.5	2.83	10.18	27.4	3.16	11.37	27.7	3.42	12.30	27.3	3.61	13.00
6.9	23.2	1.63	5.86	24.4	1.92	6.93	25.6	2.18	7.86	27.4	2.56	9.20	26.8	2.95	10.61	27.7	3.29	11.86	28.0	3.52	12.67	28.0	3.75	13.49