PUMPING UP THE VOLUME?
IT'S TIME TO THINK IN MILLIMETRES

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Although the biological needs and mechanisms of plants haven't changed, the role of the turfgrass manager has evolved significantly in recent years. Decades of research, an abundance of data driven by digital technology and a professional desire to improve has brought us a greater understanding of the impact that even small changes to practices have on the health and performance of playing surfaces.

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This desire to learn and improve is fundamental to the game of golf. More so now in the digital age, clubs' reputations rely upon the advocacy of those who play their courses.

Many of our working practices were taught to us as apprentices. These have become ingrained in both our daily routine and in our mindset. This is also often true of our approach to irrigation. The definition of irrigation is 'The method in which a controlled amount of water is supplied to plants'. And it is control that's key. The latest technologies have brought greater levels of control over all aspects of irrigation management. They are your caretaker and your watchdog, helping you optimise plant health, playing conditions, conserve water and energy, and manage costs. Managed correctly, they provide all the information needed to ensure all areas of your course receive only the volume of water they need.

When it rains, we say "we had 4mm of rain last night", we don't say "twenty minutes of rain fell last night". So if it's volume we're concerned with, why are many turf professionals continuing to apply water in minutes?

Applied vs useable water

By considering the application of water in volume rather than minutes, we can fully consider the importance of applied versus useable water. How much of the water applied is actually being used by the turf? If your control system has a Cycle + Soak feature enabled, you have a significant tool for preventing water waste and saving money. It allows the user to precisely schedule and apply irrigation to be consistent with the infiltration rate of the soil in each specific area of the golf course. The soak time enables water to be absorbed into the surface reducing wasteful run-off.

Over-applying water isn't just wasteful; it results in a shallow root system, producing a stressed grass plant that becomes more susceptible to disease and insect damage. It also encourages weeds, including Poa annua,

Carrying out an irrigation audit can be a very useful exercise

to proliferate. Overwatering also diminishes the investment you've made in fertilisers and plant protection products. Granular applications can be washed from areas of the ground resulting in an uneven effect on the turf, while liquid applications can be washed through the rootzone before they can be effective.

5 ways to improve irrigation on your golf course

Conduct an irrigation audit on your worst green

Even small environmental or mechanical changes can result in water being applied ineffectively. Are there areas of your course where you are regularly hand watering? Conduct a before-and-after audit on your worst green to ensure the pressure is correct for the set spacing. This will provide data that demonstrates the importance of regular maintenance and consistent monitoring in order to deliver optimum results from your system.

Create management zones and understand their needs

Set up site-specific management zones for your course for different microclimates, turfgrass and soil types, to ensure evapotranspiration data is managed efficiently. Use accurate soil moisture sensors to monitor moisture levels, enabling you to irrigate to target volumetric water content in each zone.

Ensure your rotors and nozzles are consistent

This ensures uniformity in the volume of water applied. Check regularly for broken nozzles as several out of action on the course will make a significant difference to coverage and ground conditions. When replacing them, try and ensure zones are consistent; don't mix and match nozzle types in a zone if that can be avoided.

Ensure the rotor settings are correct

Incorrectly set rotors can result in loss of performance of up to 60%. Check the head levels with a spirit level. Rotors tops should sit parallel to the playing surface and a slight tilt of just a few degrees will affect coverage. Ground moves over time and rotor positions can be damaged by machinery, affecting the height, level and performance.

Be proactive with your maintenance

The charts below suggest maintenance procedures to undertake in both the pump house and on sprinklers. A planned approach can help identify issues before they result in costly breakdowns, repairs and replacement.

Many irrigation systems have a raft of features and are often underutilised. Ask the manufacturer and look out for training events and seminars in your area and at trade shows which focus on improving irrigation system efficiency. When your software's working as hard as you do, it becomes a really valuable member of your team.

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Pump House Maintenance Schedule

To be carried out by golf course staff during seasonal operation	Frequency		
	Daily	Monthly	Biannually
Check the condition and security of all equipment	X		
Check for alarms on control panel. Low water, low pressure and power cuts are common faults	X		
Check for error messages on your irrigation controller or central control system	X		
Ensure the user/operator knows what pressure the pump plant should be working to. Check gauges to ensure these are maintained	X		
Check for signs of rust/corrosion		X	
Wash pump skids and pipes. Ensure no debris is restricting access to and from the pump plant		X	
Ensure all ventilation to and from the pump panel and pump house is clear of debris		X	
Physically feel if the pumps are abnormally hot. High temperatures can indicate restricted or low water		X	
Ensure filters are checked and cleaned		X	
Check water quality in the irrigation system for foreign bodies such as algae, iron and sludge			X

To be carried out by an experienced irrigation engineer/ contractor and, where relevant, an experienced pump electrician	Frequency	
	Biannually	Annually
De-energize the pump system and check all plumbing and terminal connections	X	
Clear control panel heat exchange system with airline	X	
Ensure non return valves are working correctly	X	
Ensure pumps are performing in accordance with factory specification		X
Perform motor insulation tests on all pumps		X
Ensure pumps are turning in the correct direction		X

Sprinkler Maintenance Schedule

Maintenance Description	Frequency			
	Weekly	Monthly	Annually	Other
Sprinklers				
Operation		Visually inspect operation on 6 holes/month		
Levelling		Ensure nozzle jets are not striking the turf which will significantly decrease performance	Level heads that have settled over time	
Locating & Trimming				***Continually:*** Locate and trim around sprinklers throughout the growing season
Pressure Testing				***Every 3 Years:*** Pressure test a percentage of sprinklers across the golf course to verify system hydraulics
Replacements	Check and replace any damaged sprinklers			
Rotor Testing		- Check rotation and proper ARC adjustments - Check spray pattern to ensure nozzles are not blocked - Ensure rotors are performing head-to-head coverage - Check they are not irrigating redundant areas (i.e. rough/ bunkers)		