Reducing Electricity Costs from your Irrigation System

Tim Hooper looks at how you can make savings to your electricity bills by cutting down on irrigation consumption

Electricity charges are soon to increase by 25%; it was recently announced by the BBC. So then, we should be looking at how to save on our electricity consumption on irrigation systems.

A Variable-Speed Drive Inverter (hereafter called an "inverter") will reduce electricity consumption and can make significant savings to your electricity bill. Furthermore, if your system happens to have a leak, the inverter can be set up to help minimise bursts.

An inverter when linked to a pressure sensor, controls the speed of your pump which in turn enables the pump to keep the pressure in your system at a set point, as long as the flow's required fall is within the pumps capability.

The pump or pumps in an irrigation system should be sized to operate the 'station' that has the highest flow rate (plus 10%) at a given pressure. A standard pump-starter operates the pump at full speed, drawing maximum electricity, unnecessarily for most stations and either generates unrequired pressure or passes water back to the tank via the pressure relief.; this correction is done using precious electricity which could be saved.

If an inverter is fitted, on stations that require less duty from the pump, it slows the pump down. The result is that the motor draws less electricity. For example, on a tee 12.5 metres wide and 40 metres long a pump with a 7.5kW motor can draw as little as 1.6kW. A saving of 6 kW!

If you multiply this saving of 6kW at £0.47, by eighteen tees, run each tee for an average of 15 minutes per night and 100 nights a year ; you would be looking at a saving of £1,250.00 per year on your tees alone. A saving certainly worthwhile.

Inverters have additional benefit. They can help prevent bursts on leaking systems and for those Clubs which have only single phase electrics, there are inverters that operate on single phase electricity, but run three phase motors. The impact of this is that you can run a pump with a 4kW motor instead of one with a 2.2kW motor. Some sites have three pumps, each with 4kW motors, robust enough for most irrigation systems that water greens, tees and approach. It is more costly than the standard three-phase inverter, but still far cheaper than any alternative.

There are three main styles of inverter. Each one can be installed as a single or multi-pump pumping station, but all have variable functionality.

Type 1: this inverter is an integrated part of the motor as on the Grundfos CRIE pump range. These inverters are manufactured by the pump manufacturer and as a stand alone unit, offer a reasonable level of functionality. You can also fit a single or multi-pump sets to a network. This gives full remote network monitoring, fault notification and integration to the larger types of controllers. Since the inverter is an integral part of the motor, this option is normally used when new pumps are installed.

Type 2 is a motor mounted inverter : an example would be the Lowara Hydrova. The inverter is simple to install on existing systems and has most of the functions you would want. They can also be linked together in multi-pump sets.

Type 3 is a dedicated wall mounted inverter. This option is slightly more expensive, but offers considerably more functionality and the added ability to integrate with even simple wall mounted controllers and larger PC controlled systems. The additional benefits such as the option for GSM (mobile phone) control and fault notification also offer cost benefits.

If your system has leaks, some inverters can be programmed so the ramp up (the speed the pump speeds up) on start up and the last ramp down (the speed the pump slows down) can be set to take a few minutes. This results in the mains being filled considerably slower than conventional pump starters and helps prevent water hammer.

Water hammer occurs when water travels down a pipe and then stops quickly. The energy in the water creates shock waves up and down the pipe and fittings. This results in pipe work being put under greater pressures than it was designed for and results in bursts.

Another area to consider is your controller. If your irrigation controller can only run one station at a time and your system has stations with low flows, such as tees, approaches etc. you can dramatically reduce the time the pump is run by upgrading your controller.

Modern controllers (even some wall mounted controllers) have the ability to run two or three stations at a time on the same cable path and so preventing the need for a rewire. This would obviously shorten your system run time and reduce running costs.

With electricity price hikes on the way again, and Clubs becoming increasing vigilant at curbing running and maintenance costs, you should look seriously at the inverter and controller options, if you haven't done so already.

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