

## Variable Speed Siphon Propeller Turbine



10kW siphonic propeller turbine at Borrowash Mill



- IT Power in partnership with Derwent Hydro and GP Electronics have developed a low-cost solution for generating hydro-electric power at sites with a very low fall of water (from 3m down to 1m).
- The technology is aimed at power outputs in the range 5 to 100kW. In order to save on civil engineering costs, which can often be up to half the total project cost, a siphon arrangement for the turbine was used. A suction pump primes the siphon by drawing the upstream water level up the rectangular intake section until it starts to flow down through the turbine. The use of the siphon means that no intake gate is required to shut off the flow – shutdown is achieved simply by opening a valve and breaking the siphon. It also ensures that the electrical generator is safely above flood water levels.
- The turbine itself consists of a set of guide vanes, which direct the flow through a 4-bladed propeller before discharging down a conical draft tube. A variable-speed control system allows the operating speed of the turbine to be modified to extract maximum power in different hydraulic conditions. This system is both the first siphonic turbine and the first variable-speed unit to be deployed in the UK.
- The UK has upwards of 10,000 old watermills of which fewer than 100 are currently in use. This low-cost solution to renovating these sites could have a widespread application throughout the UK.

**For further information please find contact details below:**

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