

Industry: Education

Products Used: Drives

# Inverter teaches fluid properties

A kinetic sculpture by design artist Clement Price-Thomas uses a Mitsubishi U120 Micro inverter to demonstrate the natural laws of fluids.

Clement Price-Thomas at The Royal Grammar School in Guildford, has designed and built an interactive sculpture that shows the properties of liquid vortices. He says, "I wanted to design a machine that would show children in a simple way some natural laws and would also illustrate how engineering can be used in art".



The sculpture consists of a thirty litre Perspex drum, half filled with liquid. The drum is fitted to a flanged plate on a triangular steel frame which holds it one metre from the floor. A seventy five millimetre long propeller is attached to the bottom of the plate, protruding several centimetres into the drum and its liquid. A one metre shaft passes through a rotary seal and connects the propeller to a 0.18 KW motor below. The propeller is fitted upside down, so that when it rotates, it exerts a downward force on the liquid above. This causes the liquid to form a vortex, the properties of which depend on the nature of the liquid and the force exerted.

*Application story first released September 1995 by Mitsubishi Electric UK*

As the force is determined by the propeller's speed, Mr Price-Thomas needed a method to vary motor speed. It had to be low cost, due to limited budget, and extremely simple to use so school children can easily operate the machine. He decided on a Mitsubishi Electric 0.2 KW U120 Micro inverter, as it met both of his criteria. Using the built-in key pad, pupils can easily alter the vortex's properties. With the U120 there is no complicated programming or parameter set ups. Pupils can see current flows and circulation paths of vortices by following the routes of matchsticks and twigs and how these routes change as the propeller speed changes.

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Royal Grammar School

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Mr Price-Thomas comments, "When I initially decided a variable speed inverter was going to be the best control method, I was concerned that it would be too complicated. However, the U120 is extremely simple and the pupils have had no problems with it."