Inverter enhances its solutions for pump and water applications

Mitsubishi Electric has upgraded the FR-F700-EC range of inverters with a number of functions that meet the specific needs of water and pumping applications. The new functions supported by the upgrade include a pre-charge function, built-in PLC functionality, expandable I/O and a unit calculator for PID control. These enhancements increase the capability, flexibility and scope of the FR-F700-EC bringing improved control and reducing the cost and complexity of drive installations in many applications by eliminating the need for additional components.

A key issue within many pumping applications is water hammer – the pressure surge that can occur when the flow of water starts or stops suddenly. Aside from the noise of water hammer, the vibration can quickly compromise system life and ultimately lead to break down of pipeline systems. The new pre-charge function eliminates the problem of water hammer and extends system life by gradually filling the pipeline. Flexible adjustment options enable the end of the pre-charge cycle to be controlled by feedback level, terminal input or set time.

The FR-F700-EC now also includes built-in PLC functionality, suiting the drive to standalone use in pumping and water applications and eliminating the need for a separate PLC for sequence control operations. The built-in PLC offers a program capacity of 4,000 steps, and the PLC function supports 32-bit instructions to handle 32-bit data. The inclusion of two option ports on the drive enables the I/O to be expanded with analogue and digital inputs and outputs, as well as relay outputs. This enhanced I/O can be used to provide feedback inputs for the PLC and control outputs to valves and other components. For enhanced security in the field, the program can be password protected.

The new control keypad supports the ability to display PID values in engineering units allowing for easier set up and monitoring. This is especially useful in pump and fan installations. There are actually 32 different unit settings available, for example, Pascal (Pa), liters per minute (L/M), cubic meters per minute (CM/M) or bar.

With these new functions Mitsubishi Electric has already addressed a number of applications within the pumping and water industry, for example an irrigation system where there were several pipelines of different heights and lengths, but only a single pump and pressure sensor. The built-in PLC function enabled six different PID set points to be stored, and then simply selected by a switch on the cabinet door, providing a simple solution in an application that might once have required substantial inverter and PLC knowhow.

Photo Caption: Frequency inverters can make a significant contribution towards saving energy. Mitsubishi Electric FR-F740 frequency inverters are used to regulate high-pressure pumps in waste water treatment and purification plants, for example.