

TMEiC Pump Speed Control Energy Savings

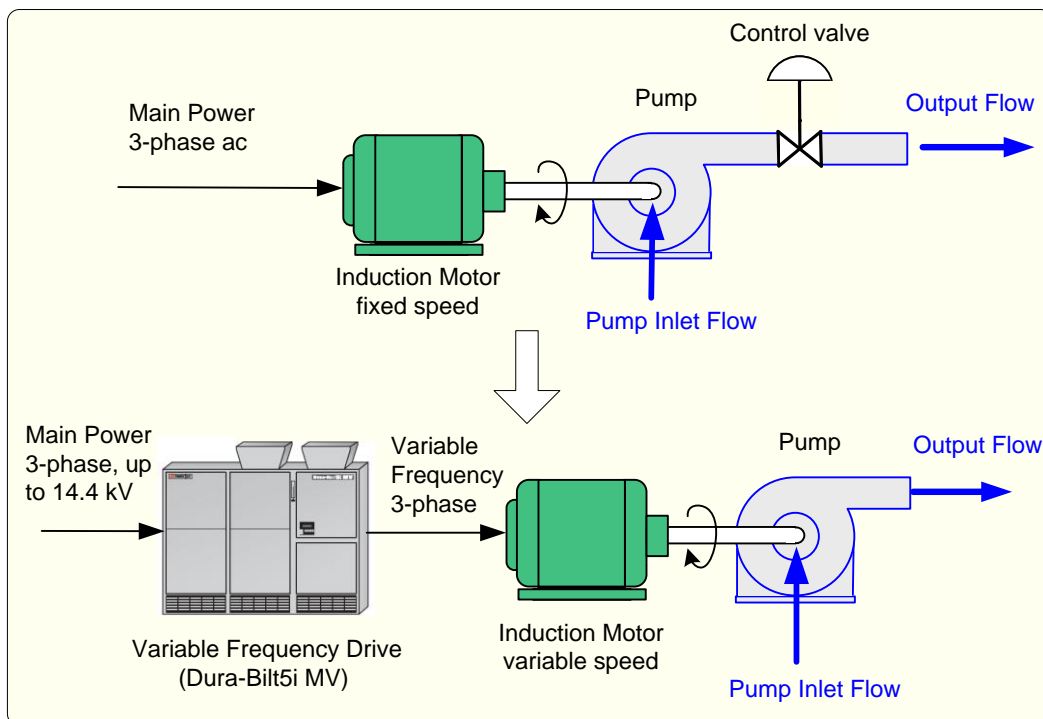
High-power pumps, such as circulating water pumps and boiler feed pumps, are used in utilities. In older pumping systems, significant energy is lost in the throttling valve which controls the water flow.

Energy savings can be realized by removing the flow control valve and using a variable frequency drive and motor to power the pump.



This example is a pump supplying water to a process and driven by a fixed speed electric motor. The water flow is controlled with a diaphragm operated control valve controlled by a signal from the process control system (PLC or DCS). If less flow is required the valve is partially closed, which reduces the flow and increases the pump pressure, while the pump runs at the same speed. This is called flow throttling, and the pressure drop across the valve causes flow energy to be lost. Also since the pump is working against a higher pressure, more energy is required from the motor.

The situation is much improved if the motor is supplied by a variable frequency drive (VFD). The control valve is no longer required since the flow is varied by changing the motor speed. The VFD is supplied by 50 or 60 Hertz three-phase power, and creates a three-phase output of any desired frequency. The motor changes speed to match the frequency supplied to it, which drives the pump to produce the desired flow.



Retrofit of a Pump for Variable Speed Operation

The pump supplies flow against a much lower pressure, so the motor power is much less. With the reduced motor power, there are significant energy savings, especially if the reduced flow is required for any extended period.

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