

Intervening Technique	Optimise the Power Consumption at Cooling Water Pump in figure Glass Industry
Before CP	<p data-bbox="581 554 863 594">Cold Water Pump</p> <ul data-bbox="537 625 1435 1434" style="list-style-type: none"> <li data-bbox="537 625 1435 1045">• Plant is operating cold water pump of 9.32 kW rated power with rated discharge of 151 m³/hr, with rated head of 15 m. Cooling water is being used for different cooling application, the suction head of the cooling water was found 3 m. The discharge line has flow control valve which was only 30 % open, indicates that the pump installed is over capacity. <li data-bbox="537 1140 1435 1434">• The pump is not operating at the optimum efficiency due to shift in flow rate from design parameter. The pump is consuming 9.5 kW power while the hydraulic power required for pumping water (@ 60 m³/hr flow as per valve position) at total head of 20 m (assumed) is only 4.5 kW. <p data-bbox="581 1514 849 1554">Hot Water Pump</p> <ul data-bbox="537 1619 1435 1850" style="list-style-type: none"> <li data-bbox="537 1619 1435 1850">• Plant is operating hot water pump of 15 kW rated power with rated discharge of 120 m³/hr, with rated head of 28 m. Water is being pumped to the cooling tower, the suction head of the cooling water was found 1.5 m. The discharge

line has flow control valve which was only 50 % open, indicates that the pump installed is over capacity. The pump is not operating at the optimum efficiency due to shift in flow rate from design parameter. The pump is consuming 15 kW power while the hydraulic power required for pumping water (@ 72 m³/hr flow as per valve position) at total head of 30 m (assumed) is only 7.8 kW.

Recommendation:

Hot Water Pump

- It is recommended to install a Variable Frequency Drive with pressure feedback on this pump to optimize the power consumption without replacing the pump as well as keeping option of load increment in future; the VFD will save approximately 21000 kWh per annum.

Cold Water Pump

- Thus it is recommended to install a Variable Frequency Drive with pressure feedback on this pump to optimise the power consumption without replacing the pump as well as keeping option of load increment in future; the VFD will save approximately 29400 kWh per annum.

Total save Approximately 50400 KWh per annum.

Benefit	
Environmental	<ul style="list-style-type: none"> • Per Day reduction in the Electricity consumption: 140 KWh • Per Year reduction in Electricity consumption: 50400 KWh

	<ul style="list-style-type: none">• Per Day reduction in Greenhouse Gas (CO₂) emission: 0.12 MT of CO₂ <p>Per Year Reduction in Greenhouse Gas (CO₂) emission: 43.34 MT of CO₂</p>
Economical	<p>Investment: Rs. 55,000 /-(for 2 VFD)</p> <p>Annual Savings: Rs. 3,80,016/- per annum</p> <p>Payback Period:2 Months</p>