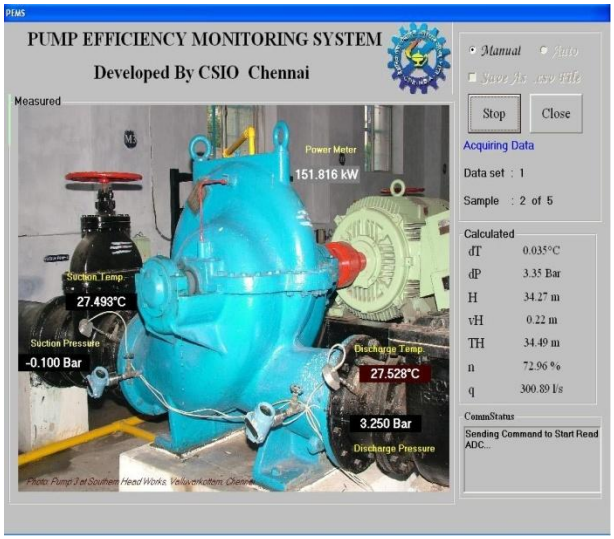
Pump Efficiency Monitoring System [PEMS]

Pumping systems account for nearly 20% of the world's electrical energy demand. Energy and maintenance costs are typically about 90% of a pump's Life Cycle Cost. Studies have shown that 30% to 50% of the energy consumed by pumping systems could be saved through monitoring the efficiency. As the energy costs are soaring, any effort in energy conservation in running the pumps can reduce the overall demand for electrical supply as well as reducing the burden on the consumer. At present, the efficiency of the pump is calculated off-line by taking measurements of flow, electrical power consumption, head and pipe dimensions with different instruments. The flow meters are still very expensive.



CSIO Chennai Centre developed a low cost Pump Efficiency Monitoring System (PEMS) based on the thermodynamic principle using the latest state-of-art instrumentation PEMS is an on-line pump efficiency-monitoring tool. PEMS developed by CSIO Chennai uses the method of thermodynamic principle. The pump losses are calculated from the *measurement of inlet and outlet fluid temperature and the dynamic head* developed by the pump. Pump Efficiency is then calculated. By monitoring the electrical power to the motor, the pump flow rate is also calculated.

Specifications:

Suction Side Unit:

Temperature Range	: 0 - 45º C
Temperature Accuracy	: 0.001º C
Pressure Range	: -1 to 5 Bar
Pressure Accuracy	: 0.025% of full-scale
Output	: RS485 with MODBUS RTU Protocol

Discharge Side Unit:

Temperature Range	: 0 – 45º C
Temperature Accuracy	: 0.001ºC
Pressure Range	: 0 to 15 Bar
Pressure Accuracy	: 0.025% of full-scale
Output	: RS485 with MODBUS RTU Protocol

Power Meter:

Accuracy	: CLASS I (±1%)
Voltage Input	: 0-270V rms
Current Input	: 0-5A rms
Output	: RS485 with MODBUS RTU Protocol

Master Unit: (Stand-alone Version)

Input	: RS485 with MODBUS RTU Protocol &Keypad
Output	: 4 line LCD Display & RS232 for PC interface

Master Unit: (Computer Version)

- P IV, 2.66 GHz and above
- PEMS Application Software on Windows XP

Applications:

- On-line Flow & Efficiency measurement with an accuracy of 1%
- Operation of pump with optimum energy consumption
- Proper Planning & Maintenance of the pump
- Refurbishment of the pump at appropriate time periodically to increase the life of the pump
- Facilitate operation of pump at Best Operating Point (BOP)