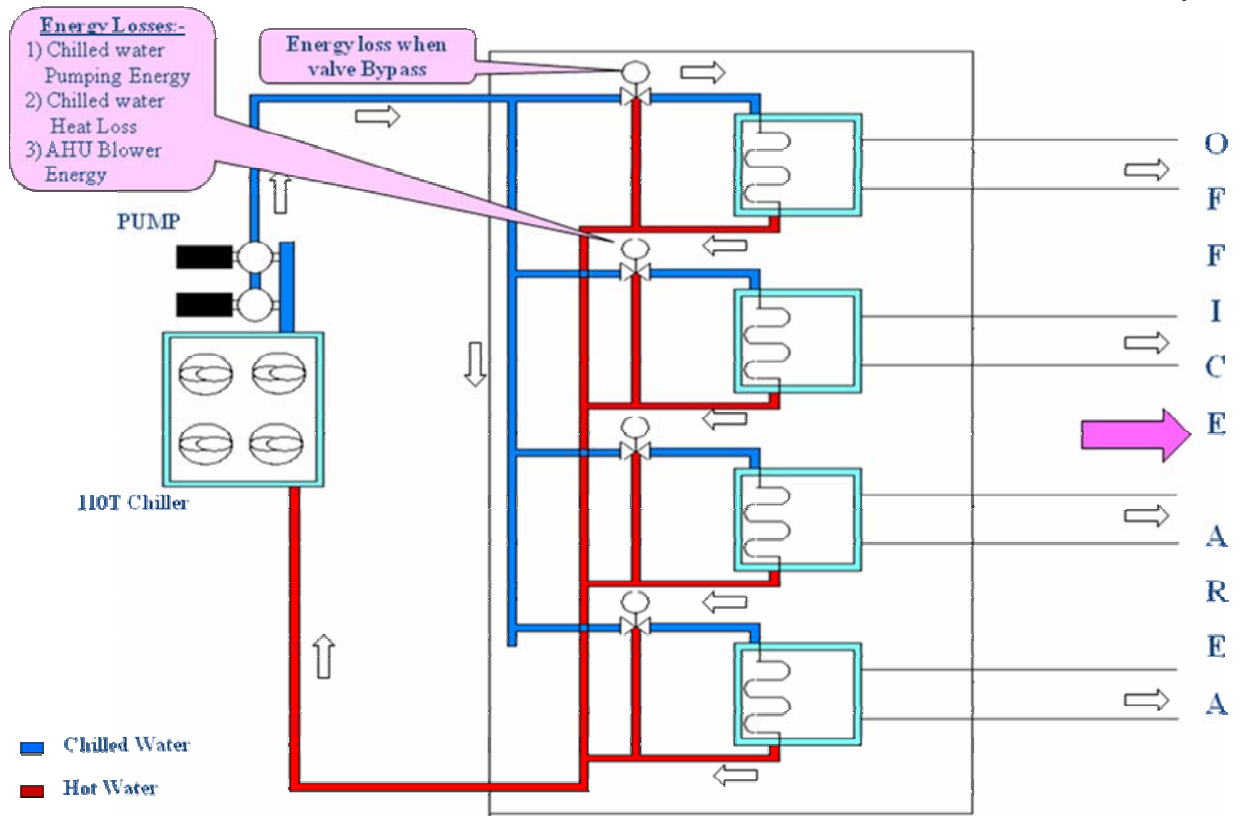


Successful Implementation – Energy Conservation Measure

Measure - Install VFDs for close loop control of HVAC in office area
Equipment Air Handling Units
Industry / Sector - Automobile
Year of Implementation 2007 - 2008
Cost Benefit Analysis
<input type="checkbox"/> Type of Measure: Implement close loop system for Office AC AHU using VFDs and temp controllers
<input type="checkbox"/> Annual energy Savings : Rs 1372800/-
<input type="checkbox"/> Actual cost savings : 2608320/-
<input type="checkbox"/> Actual investment : 230000
<input type="checkbox"/> Payback : 2 months
Implementation Highlights
<input type="checkbox"/>

Summary

Implement Close loop system using VFD in place of conventional chilled water by pass system to control temperature in office AC



Background

Our AC & ventilation system comprises of 1 110Tr chiller with 6 nos of AHUs (23KW total) and 2 Air washers (30 KW).

Earlier conventional chilled water by pass (using 3 way valve) was used to control the chilled water flow through AHU coils in order to maintain the temperature. Where as the AHU fans rotate at full speed.

Losses Identified :

- 1) Chilled water Pumping Energy
- 2) Chilled water Heat Loss for the bypassed water.
- 3) AHU Blower Energy
- 4) Over loading of chiller compressor due to over cooling (controls not precise)

Principle

The new system incorporated VFDs and temperature controllers in close loop and eliminated use of by pass valve.

The temperature of the room was sensed by temp sensor and feedback given to temperature controller. This in turn gives control output to VFD attached to AHU Fan motor. The speed of fan is controlled by this VFD depending upon the temperature set on the Temperature controller.

Following benefits were obtained after implementation :

1. No pumping energy loss due to bypass system. As all the chilled water pumped was utilized for cooling.
2. AHU blower motor was running at 30% speed on an average thereby reducing fan energy consumption.
3. Loading on Chiller compressors reduced as no overshoot of set temperatures
4. Comfort level in the office area increased as more precise control was incorporated.

Details of techno-economics:

Particulars	Actual energy savings
Office AC System- Energy consumption	
Earlier Average Energy consumption per day	1350 KWH
Energy consumption per day after implementation	550 kWh
Energy savings per month @ Rs. 5.5 / kWh	114400/-
Annual Cost savings, Rs. lakh	Rs 1372800/-
Cost of implementation, Rs. lakh	Rs 230000/-
Simple payback period, Year	2 months

Implementation issues

As the changeover was done during working condition, the work had to be planned on holidays.

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