CLAIMS

1. A method of operating a Heating, Ventilating, and Air Conditioning (HVAC) arrangement for a building, the HVAC arrangement comprising

an Air Handling Unit (AHU) loop with at least one AHU, with at least one electric chilled water pump, and with at least one electric AHU fan for supplying air to the building from the AHU, wherein cooling water is circulating in the AHU loop,

a cooling tower loop with at least two cooling towers, each cooling tower comprising at least one electric cooling tower fan, and with at least one electric condenser water pump, wherein condenser water is circulating in the cooling tower loop,

at least one chiller, the chiller comprising an evaporator, an electric compressor, a condenser, an expansion valve, and a refrigerant, which form a thermodynamic refrigeration cycle which interconnects with the AHU loop and with the cooling tower loop such that heat is transferred from the cooling water to the condenser water, and

a Master Controller (MC) for controlling the at least one electric chilled water pump, the least one electric AHU fan, the at least one electric cooling tower fan, and the at least one electric condenser water pump, the method comprising

S3-AHU) the MC changing speed of the at least one electric chilled water pump such that a return chilled water temperature does not exceed a predetermined upper limit of return chilled water temperature and such that a delta T value of the chilled water does not exceed a predetermined thermal comfort delta T limit,

S4) the MC selecting a number of active cooling towers with adjusting speed of their respective cooling tower fan, and

S1-CT) removing water flow restrictions in the cooling tower loop by manually opening fully at least one water valve in the cooling tower loop with the MC reducing the speed of the at least one electric condenser water pump,

wherein the aforementioned steps are provided in a balanced state of heat transport rate from the AHU to the cooling tower, and such that the same heat transport rate between the AHU and the chiller is maintained, while overall energy consumption is reduced.

2. The method according to claim 1 further comprising

S1-AHU) removing water flow restrictions in the AHU loop by manually opening fully at least one water valve in the AHU loop with the MC reducing the speed of the at least one electric chilled water pump.

3. The method according to claim 1 or 2 further comprising

S5) the MC adjusting a position of a water valve of the AHU for changing flow rate of water in the AHU with adjusting speed of the at least one electric AHU fan to provide a desired user thermal comfort with reduced energy consumption.

4. The method according to any one of the above-mentioned claims further comprising

S2-AHU) the MC selecting a number of active electric chilled water pumps with adjusting their respective speed.

5. The method according to any one of the above-mentioned claims further comprising

S2-CT) the MC selecting a number of active electric condenser water pumps with adjusting their respective speed.

6. The method according to any one of the above-mentioned claims further comprising

S6) the MC adjusting speed of the cooling tower fan depending on ambient conditions, to change supply condenser water temperature, for reducing total energy consumption of the cooling tower fan and of the electric compressor in the chiller.

7. The method according to any one of the above-mentioned claims, wherein
the at least one electric chilled water pump, the least one electric AHU fan, the at least one electric cooling tower fan, and the at least one electric condenser water pump are operated within predetermined boundary conditions.

8. A Master Controller (MC) for operating a Heating, Ventilating, and Air Conditioning (HVAC) arrangement for a building, wherein the MC comprises interfaces

- for at least one electric chilled water pump and for at least one electric Air Handling Unit (AHU) fan of an AHU loop of the HVAC arrangement, and
- for at least one electric cooling tower fan and for at least one electric condenser water pump of a cooling tower loop of the HVAC arrangement,

wherein the MC is adapted to issue control signals to the interfaces for controlling the at least one electric chilled water pump, the at least one electric AHU fan, the at least one electric cooling tower fan, and the at least one electric condenser water pump, and

wherein the MC is adapted to perform automatically steps of a method according to any one of the above-mentioned claims

such that the aforementioned steps provide a balanced state of heat transport rate from a AHU to a cooling tower of the HVAC arrangement, and such that the same heat transport rate between the AHU and a chiller is maintained, while overall energy consumption is reduced.

9. The MC according to claim 8, wherein
at least two electric chilled water pumps are provided.

10. The MC according to claim 8 or 9, wherein
at least two electric condenser water pumps are provided.