

Thermal Storage Heating and Cooling System Technology

Dr. Ookjoong Kim
Department of Thermal Systems
T. +82 - 42 - 868 - 7326
E. ojkim@kimm.re.kr

⇒ Technology that adds thermal storage tank to the heat pump system for cooling, heating, and water supply

Client / Market

- Cooling, heating and hot water supply market in residential and industrial sectors

Necessity of this Technology

- Existing small sized ice and cold water storage facility is used for cooling only that annual operation efficiency is very low.
- To improve the annual operation efficiency, a heat pump with thermal storage tank that used for all 4 seasons is applied

Technical Differentiation

- Cooling and hot water supply operation using ice storage + hot water storage system during summer season and hot water thermal storage operation system during other seasons
- Heat pump cycle to generate medium-temperature water of 60°C to 70°C during heating

Excellence of Technology

- Prototype production and performance realization through system design and cycle simulation
- Over 12% energy saving compared to conventional boilers
(※ Boiler : 85% of efficiency for direct combustion type, electrical production/power transmission efficiency of 40%, 90%, respectively; assumption)

DESIRED PARTNERSHIP

Technology Transfer

Licensing

Joint Research

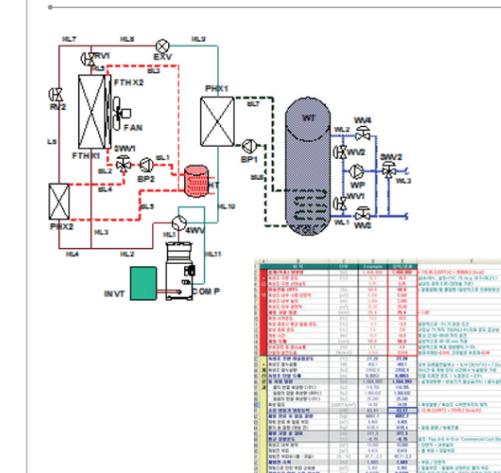
Other



TECHNOLOGY READINESS LEVEL [TRL]

Research, basic explanation | Project concept or idea development | Technology idea verification | Prototype development | Trial product production/ evaluation in similar environment | Pilot field demonstration | Development and optimization of commercial model | Commercial product demonstration | Mass production and initial market launch

System Design (Top) Cycle Simulation (Bottom)



Installation of Prototype



Current Intellectual Property Right Status

PATENT

- Heat Pump System Equipped with Heating and Control Method (KR0721420)
- Thermal Storage Type Heat Pump Design Program (06-01-121-002799 program registered)

KNOW-HOW

- Heat pump design technology generating medium temperature water
- Compressor selection, optimal capacity control technology
- Ice-on typed ice storage and hot water thermal storage tank design technology
- Year-round operation dynamic simulation, performance test