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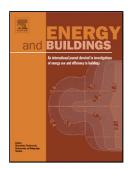
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## ACCEPTED MANUSCRIPT

Thermodynamic analysis of a novel heat pump water heater with
two-stage heating for a great rise of water temperature
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Highlights
1. Introduction of a novel two stage compression cycle and its compressor
2. Thermodynamic analysis of the novel two stage cycle
3. Optimization of condensing temperature of first stage for COP and heating
capacity in the novel two stage cycle
4. Investigation of the effect of relative liquid injection mass and evaporating
temperature on performance
5. Higher COP than conventional two stage compression cycle for a great rise of
water temperature

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