

# Influence of Different Defrost Strategies on Heat Pump Efficiency

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## **Abstract**

Heat pumps are rapidly increasing their share in the HVAC sector with the 10 years average annual growth rate in EU sales of around 10%. Units with air as a heat source are dominant compared to ground and water units. That is why in this article we are addressing one of the main problems of air source heat pumps - frosting of the evaporator. Capacity and efficiency drop caused by the ice on the surface of the evaporator is a well-known phenomenon for which the mostly used solution is reversing the cycle. It results in short periods of taking the heat from heat transfer fluid to defrost the ice accumulated on the exchanger surface. Decreasing the efficiency of the heat pump occurs when the periods between defrost cycles are too long and high thermal resistance of the ice on the walls of the evaporator reduces heat transfer efficiency or cycles are too short which cools the fluid excessively. In this study, improvements in optimally timed parameter driven defrost cycles were compared to traditional timer-driven defrosting.