Active magnetic regenerators implemented as a magnetocaloric heat pump for residential buildings

The main objective of the ENOVHEAT project is to develop, build and test the prototype of an innovative and efficient heat pump system based on the active magnetic regenerator technology and to demonstrate that it can be used for building space heating applications. With a maximum COP of 3.93 and a nominal useful heating power output of 2600 W, the ENOVHEAT Gadolinium magnetocaloric heat pump can be integrated into a low-energy house with a vertical borehole ground source heat exchanger and a radiant under-floor heating system within a single hydronic loop. It is able to provide for the dwelling’s space heating needs under Danish winter conditions. Moreover, a control strategy for heat energy storage in the indoor environment can be employed to optimize the MCHP operation and reach seasonal COPs of up to 3.51. However, the layered La(Fe,Mn,Si)\textsubscript{13}Hy prototype is currently not suitable for such application.

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