



HIGH EFFICIENT AIR/WATER HEAT PUMPS WITH CONTINUOUS CAPACITY CONTROL

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SUMMARY

During preceding Swiss Federal Office of Energy research projects “optimisation of fin tube evaporators by reduction of ice and frost formation” and “exergy analysis for increasing the efficiency of air/water heat pumps” valuable findings concerning the increase in efficiency of air/water heat pumps were gained. These findings are now to be implemented in a practical and realistic manner. The aim is to develop universally valid design and planning criteria (“guidance”) for the realisation of efficient, reliable and economic air/water heat pumps with continuous capacity control. The main measure to improve the efficiency of air/water heat pumps is to continuously adapt the generated heating capacity to the heat demand of the building. An optimised process control strategy depending on the applied control principal of the heat pump shall be developed using simulations as well as experiments. A further goal is to develop an optimised defrosting control with application of the ambient air defrosting technique. A prototype of a heat pump with continuous capacity control will be realised to investigate the developed control strategies. Various combinations of heat sources (climatic conditions) and heat sinks (heating systems) will be considered. This study shall provide an incentive for the further development as well as the increase of efficiency of air/water heat pumps, both by heat pump and component manufacturers as well as by designers of building services engineering.