

Title: Testing the influence of the exchanger's surface flexibility ground sound heat pumps type direct expansion/water.

Summary :

This work presents the development and testing of an oil recovery system in ground evaporators, direct expansion/water heat pumps. Such a system significantly extends the dimensioning possibilities of freon ground heat exchangers, thus contributing to higher COP energy efficiency indicators of this type of heat pumps. The research is divided into two issues, the first concerning the impact of heat exchanger sizing on energy efficiency in terms of unit and seasonal COPs. In addition to the dimensioning itself, this part also deals with the issue of not so much comparing the size of the exchanger as changing its arrangement from one to two-plane. The second and key issue concerns the development of a system for recovering oil from ground evaporators and its testing in terms of correctness and optimization of operation. This chapter has been divided into the study of the system in the oil recovery mode in relation to the operation of the expansion valve, the determination of optimal periods along with the method of controlling the electric shut-off valves, and as the last point - the study of the impact of periodic shutdowns of the exchanger on the decrease of the COP coefficient. In addition, the work raises the issue of using the developed solution in serial devices, specifically the presentation of the control algorithm and the design of the system along with its location in the heat pump unit. The entire project was carried out on a test stand prepared to work in real conditions. In order to implement the project, a test stand was made, along with ground exchangers, buried at a depth of 1.2 m - two single-surface exchangers, and 2m and 1 m - one two-surface exchanger, on a total area of 800m², thus enabling the operation of the lower energy source in real conditions.