



## METHODOLOGY FOR MEASURING TEMPERATURE CONDITIONS OF HEAT PUMP OUTDOOR UNIT

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### **ABSTRACT**

Heat pumps that use ambient air as a heat source are becoming increasingly popular. The primary reason for this is that this type can be installed at low cost, while at the same time there is no significant difference in annual COP compared to geothermal models. Importantly, however, the energy density of the air heat source is extremely low, a large amount of it has to be passed through the heat exchanger of the outdoor unit. For this reason, care must be taken when setting up the outdoor unit to ensure that nearby buildings and structures do not interfere with the air flow. If the installation conditions are inadequate, a hydraulic short circuit may occur between the intake and exhaust sides, resulting in a drop in the temperature of the intake air. This phenomenon has a direct impact on the achievable COP and thus on the energy consumption of the overall system. Given that this phenomenon is not detectable by the outside observer, a measurement procedure has been developed to detect and measure the effect. Our aim is to develop a method that can be implemented with the simplest possible measurement procedure, using the fewest possible sensors, which gives results that are as accurate as those obtained using many instruments and a complex evaluation procedure. This will allow the environmental parameters of previously installed outdoor units of heat pumps to be studied, with particular reference to temperature conditions.

*Keywords: Heat pump, outdoor unit, temperature condition, inlet air temperature, COP.*

*Acknowledgements: The research was supported by the project 'The feasibility of the circular economy during national defense activities' of 2021 Thematic Excellence Program of the National Research, Development and Innovation Office under grant no.: TKP2021-NVA-22, led by the Centre for Circular Economy Analysis.*