

HEAT PUMPS TECHNOLOGY OF HEATING AND COOLING

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Increasing concern to society ecological and environmental issues, the demand for more efficient ways of using heat and energy is growing. Heat pump industry uses year-round heating with thermal energy. This concept is done by providing localized or redirected heat, by the exchange of cold air with the heated air.

A heat pump can generate heat, cool; in some applications it's preferred to separate heating and cooling systems. A heat pump is a device that uses a small quantity of energy to move heat from one location to another. It is used to pull heat out of the air, water or ground to heat a building, but it can be reversed to cool a building. A large quantity of low-grade energy absorbed from the environment is transferred to the refrigerant inside the heat pump via evaporator. This causes the temperature of the refrigerant to increase causing it to change from a liquid to a vapor state. The refrigerant is then compressed by compressor, reducing its volume but rising its temperature. A heat exchanger (condenser) extracts the heat from the refrigerant to heat water for central heating, underfloor heating or domestic hot water. After giving up its heat energy the refrigerant turns back into liquid and after passing through an expansion valve can again absorb energy. If it's necessary to heat water, there are several options: ground horizontal collector laid in 1 meter deep holes, 1 meter apart, if you have enough ground; pipe in nearby water such as sea, lake or pond, which can be still or moving; a borehole, especially useful if you have limited space.

Of special interest is cooling and heating modes. In the winter, the refrigerant absorbs heat from outdoor air suction across the outdoor heat exchanger. The refrigerant becomes hot but is made even hotter by going through the compressor. In the summer, heat pump changes the flow of refrigerant. Now the refrigerant absorbs heat from room air. In this manner, heat and humidity are removed from the air, and cool, dry air is distributed throughout your home.

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