

INTEGRATED ENERGY EFFICIENT HANDLING UNIT SUPER SE (SAVE ENERGY)

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In this article the author presents his own air conditioner and development methodology graphical-analytical analysis of the percentage annual division of energy cost. The main advantages of air handling unit in the recycling loop refrigeration compared with the traditional method of heating by electric heaters.

Integrated energy efficient handling unit - a setting which combines several systems: ventilation system, air heating and air conditioning, and when working in any of these modes is achieved by a high level of energy saving.



Integrated energy efficient handling unit with air source heat pumps are more efficient in heat recovery and could be used as a central air conditioner in a cooling mode. The heat pump is controlled by a microprocessor that controls air parameters and ensures efficient energy use. The refrigeration system of

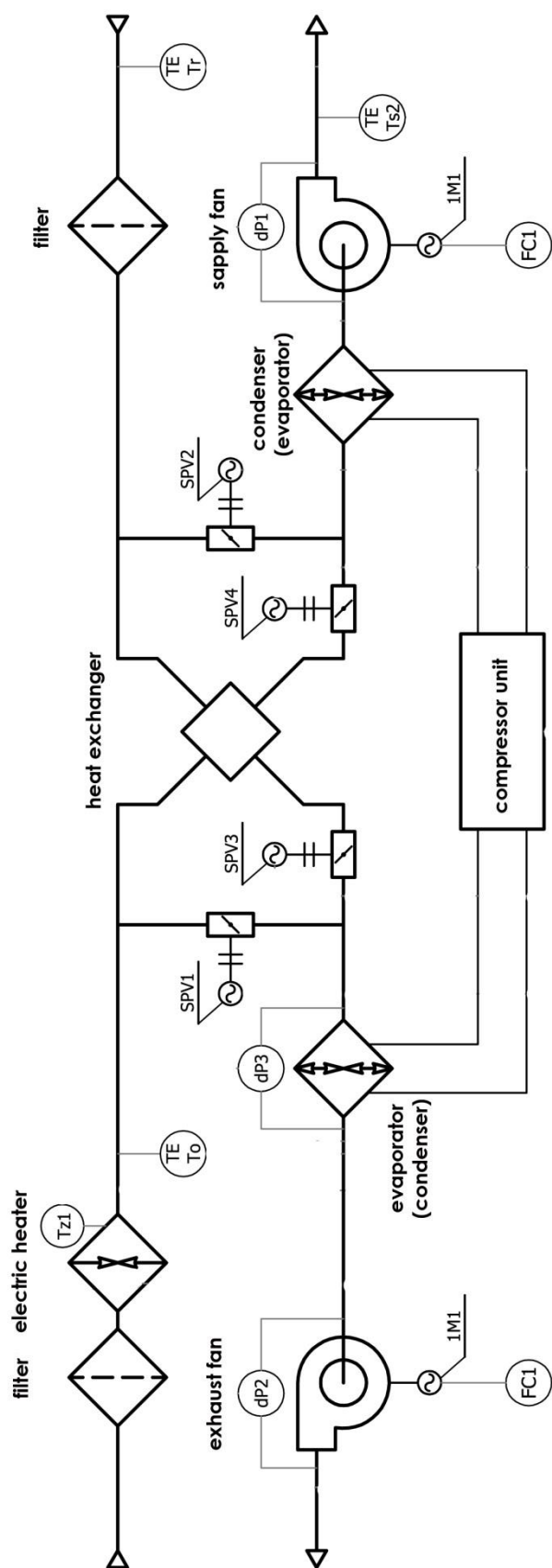
the heat pump includes a variable capacity scroll compressor that enables precise temperature control and efficient energy use. For best heat transfer Cu-Al evaporators and condensers are used. In all heat pumps, the R410A refrigerant, with has a zero ozone depletion potential, is used. A controlled 4-way valve automatically switches between cooling and heating mode. The unit provided a defrost by not turning the unit off. The construction of unit enables the use cooling mode equivalent split system air conditioning with outdoor unit. Components used in the units ensures safe and efficient work of the heat pumps.



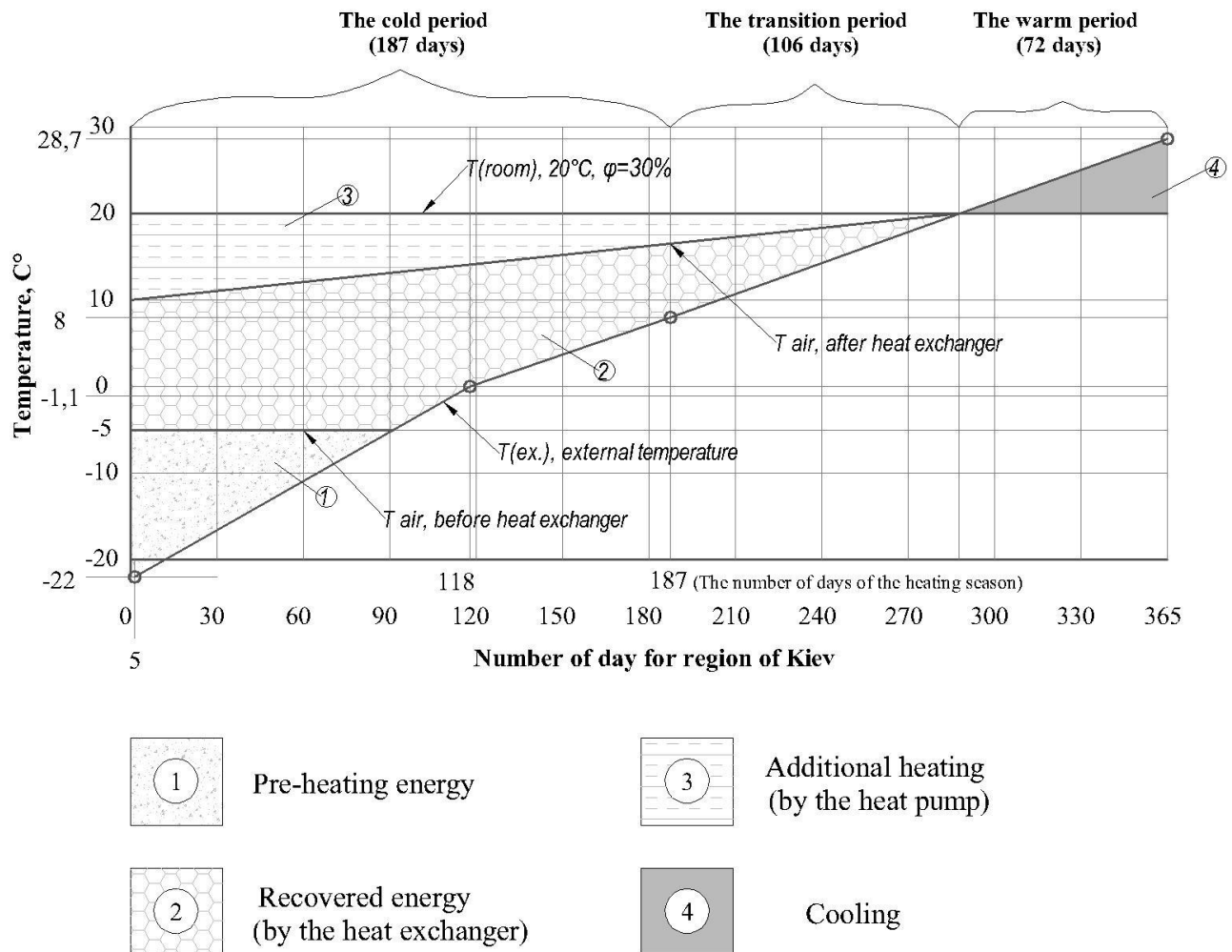
Built-in fans Fischbach have characteristics:

- motor protection IP65
- insulation class F (150°C)
- motor shaft vibration isolator
- balance to Q1(ISO1940/2)
- compact size
- double row ball bearing (high temperature up to 180°C)
- temperature of transported air up to 80°C

schematic diagram of the unit



Drawing. 1. Graphic-analytical method for determining the percentage of the annual division of energy cost for Super SE handling unit (Graphic-analytical method Bo-Za)



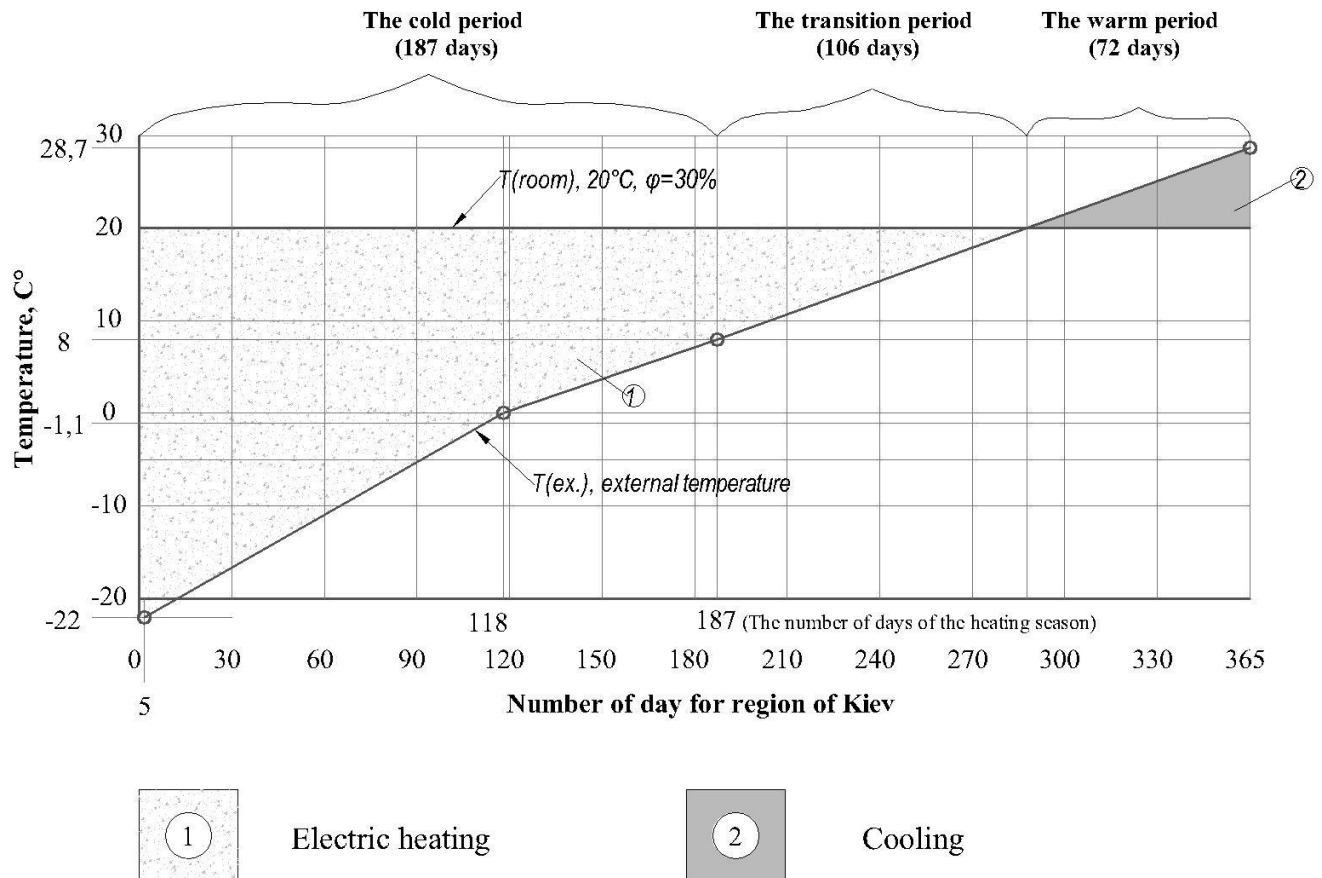
This graphic-analytical method to determine the percentage of energy in various modes produced by the unit (or different systems) throughout the year. The results are shown in Chart 1.

Chart 1.

Annual division of energy cost for Super SE handling unit.

	Mode	%
	Pre-heating energy	13
	Recovered energy (by the heat exchanger)	55,4
	Additional heating (by the heat pump)	26
	Cooling	5,6

Drawing. 2. Graphic-analytical method for determining the percentage of the annual division of energy cost for traditional handling unit with electric heater (Graphic-analytical method Bo-Za)



This graphic-analytical method to determine the percentage of energy in various modes produced by the unit (or different systems) throughout the year. The results are shown in Chart 2.

Chart 2. Annual division of energy cost for traditional handling unit with electric heater.

	Mode	%
	Electric heater	94,4
	Cooling	5,6

The comparison shows that for air heating using electric heaters in the first example is used only 13% of the total thermal energy, whereas in the second case, the value is - 94.4%.

The remaining 81.4% the thermal energy are covered by recovered energy (by the heat exchanger) and additional heating (by the heat pump).

This method allows to:

- Determine the percentage ratio of the amount of energy it takes to process the air throughout the year.
- Compare the effectiveness of different systems.
- Visually analyze the operation of the HVAC systems in different periods of the year

Uses of literature

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ІНТЕГРОВАНА ЕНЕРГОЕФЕКТИВНА КЛІМАТИЧНА УСТАНОВКА SUPER SE (SAVE ENERGY)

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Анотація. У даній статті автор презентує власну розробку кліматичної установки і методику графоаналітичного аналізу процентного розподілу витрат енергії протягом року. Розглянуто основні переваги обробки повітря в агрегаті з холодильним утилізаційним контуром в порівнянні з традиційним методом нагріву за допомогою електричних нагрівачів.

Аннотация. В данной статье автор презентует собственную разработку климатической установки и методику графоаналитического анализа процентного распределения затрат энергии на протяжении года. Рассмотрены основные преимущества обработки воздуха в агрегате с холодильным утилизационным контуром по сравнению с традиционным методом нагрева с помощью электрических нагревателей.