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Комплексное обслуживание
торгового бизнеса

The integrated solutions for improving the efficiency of the engineering equipment in retail

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Covering of refrigerated display cases on the basis of double-glazed windows

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At the moment, there are two main types of energy-saving covers for refrigerated display:

K-Glass
It is a tempered glass with a thickness of about 6 mm. On the inner side of the glass, a hard, low-emission coating, K-Coating, is applied.The coating is a thin layer of metal oxides.
Implemention allows you to reflect heat radiation, thereby reducing heat flows into the refrigerator display case.
The application of the hard K cover is made only by foreign factories.

Double-glazed windows
The structure consists of two glasses held together by a sealed frame. The air layer between the two panes works as an effective heat insulator. In addition, a soft cover is applied to the part of the double-glazed window.
Low-emissive cover allows you to reflect thermal radiation.

The double-glazed window covers disigned specifically for the equipment supplied by Land allow you achieve unprecedented perfomance in reducing the requirement of cold of the equipment

Covers of refrigerated display cases on the basis of double-glazed windows

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Double-glazed window	K-glass
Manufacturing	
domestic	imported
Glass thickness	
18 мм	6 мм
Hermetic fit to the frame	
Yes	No
Field of view	
92,6	94,6
Heat transfer	
1,4	3,6
Reducing refrigeration capacity	
70%	40%

* Data based on comparative laboratory tests of an open display case and a display case with covers.

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RU **Production is localized in Russia fully**

Long lifetime

Reducing necessity of refrigeration capacity by 70%.

Significant savings in operating costs (OPEX) and capital costs (CAPEX).

Payback period for the use of double-glazed windows in a standard store «At HOME» - IMMEDIATE due to lower operating costs.
The using of double-glazed windows makes it possible to increase the evaporation temperature

Refrigeration machine with integrated heat pump

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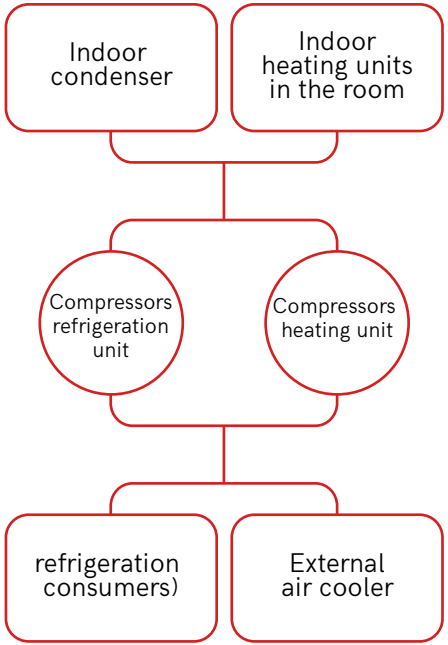
The unit is a combination of a heat pump and a refrigeration unit.

The solution allows you to distribute the cooling and heating capacity of the unit depending on the current demand.

Installation exterior



Block diagram

Installation structure:
1- Variable speed compressor to provide cold consumers;
2-Variable speed compressor to provide heat consumers;
3- Universal compressor.

The automation system switches the compressor between the refrigeration unit circuit and the heat pump circuit.

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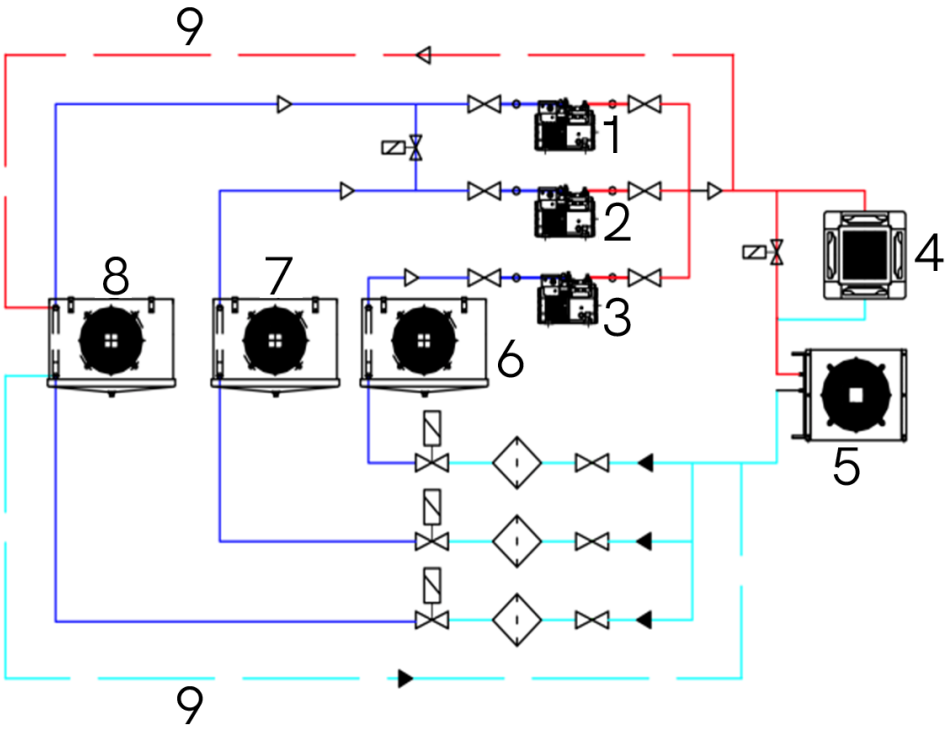

Installation structure:

1 – Heat pump compressor;
2-Universal compressor;
3-Low-temperature compressor;
4-Air heat exchanger for heating the trading floor;
5-The condenser;
6,7,8-The evaporator of the low-temperature, medium-temperature circuit and the heat pump, respectively;
9 – Hot gas defrost line.

Functional diagram of the operation of a refrigeration compressor unit combined with a heat pump

Advantages of a refrigeration machine with an integrated heat pump

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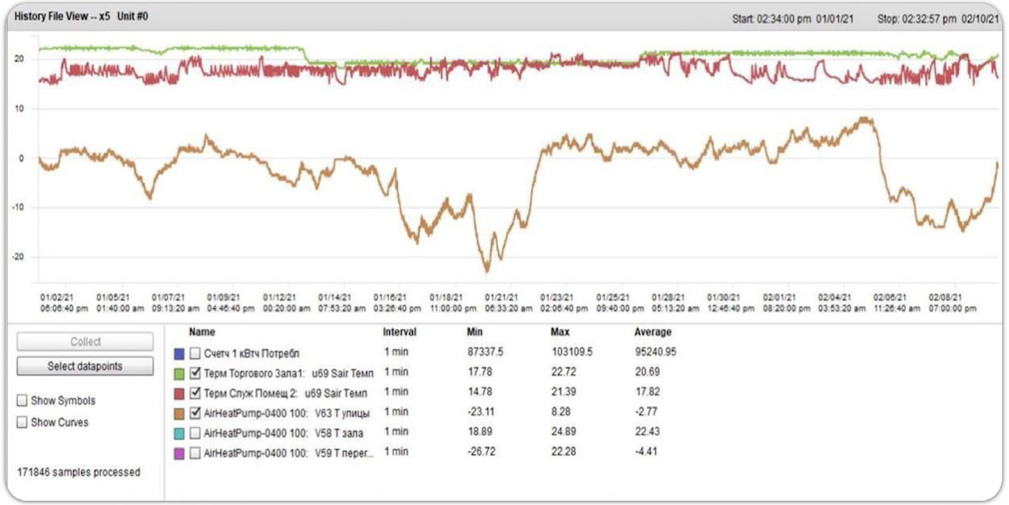

Data from the monitoring system.
Shop "Pyaterochka", Mikhailovka.
Realized in the summer of 2020.

Heating
The use of this technology allows you to provide the store with heat all year round.

Energy efficiency.
The use of this technology allows you to reduce the energy consumption of the object.

Low payback period
For a standard store "At home", the payback period is less than a year.

Environmental friendly.
The use of this technology allows you to use the heat of the surrounding air to heat the store

Estimation of experts

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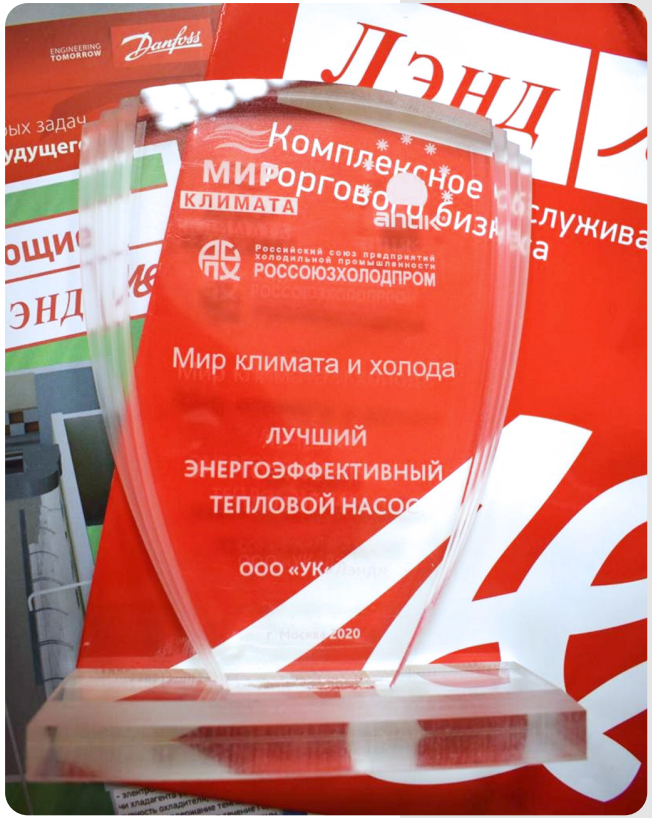

R410A. Reduced capital and operating costs

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Higher recovery rates.
The use of the R410A in an integrated heat pump increases its efficiency.

Payback period in comparasion R404A - much shorter by reducing the cost of installation materials and operating costs you can get immediate payback period

Lower electrical energy consumption compared to R404A

Lower service cost.
Due to the reduced mass consumption- the filling volume is lower, the diameters of pipelines and fittings are smaller.

In February 2021, LAND company implemented the first store in Russia with the use of R410A

R410A - R404A comparison

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R410A	R404A
Safety	
Non-flammable, non-toxic, non-explosive. Suitable for use in public places	
Ecological compatibility	
GWP - 2088	GWP - 3933
Energy efficiency	
Higher by 8%	
Heat potential	
100°C	76°C
Cost of the refrigerant	
The difference in cost is about 6% in favor of the R410A.	
CAPEX and OPEX	
Reduced capital and operating costs when using 410A	

Advantages of R744 (CO2)

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Energy efficiency is 15-25% higher than with R404A

The COP of low-temperature compressors is 3 times higher compared to the compressors on R404A/R507A

R744 (CO2) is a natural refrigerating agent and has no environmental effects.
GWP = 1

The use of R744 (CO2) allows to get significantly more high-potential heat in comparison with R404A/R507A.

The payback period for R744 (CO2) solutions for small format stores is about 3 years, for large formats, the period is even shorter

Integrated automation system for engineering systems

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Refrigeration equipment

Lighting

Monitoring

Heat curtain

Air condition

Energy consumption

For heating control, air conditioners, ventilation systems, outdoor and indoor lighting use programmable logic controller.

The controller algorithm allows you to customize the operation of the systems to the changing external conditions- street temperature and light, as well as to eliminate the human factor on the part of the store employees.

Based on the calculated data, the organization of an integrated control system allows you to achieve a reduction in energy consumption by 20-25% only by optimizing the operation of the equipment.
The use of the system in combination with the previously listed solutions will significantly increase the benefit.

We invite you to cooperate

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