CONSTRUCTION OF SOLAR HEAT DEVICES FOR BUILDINGS AND CONSTRUCTIONS AND STUDY OF THEIR CHARACTERISTICS

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Abstract: *This article provides information on the construction and use of solar thermal devices for buildings and structures, regarding its consideration as an energy-saving measure, as well as the determination and implementation of the benefits of this energy to enterprises and organizations.*

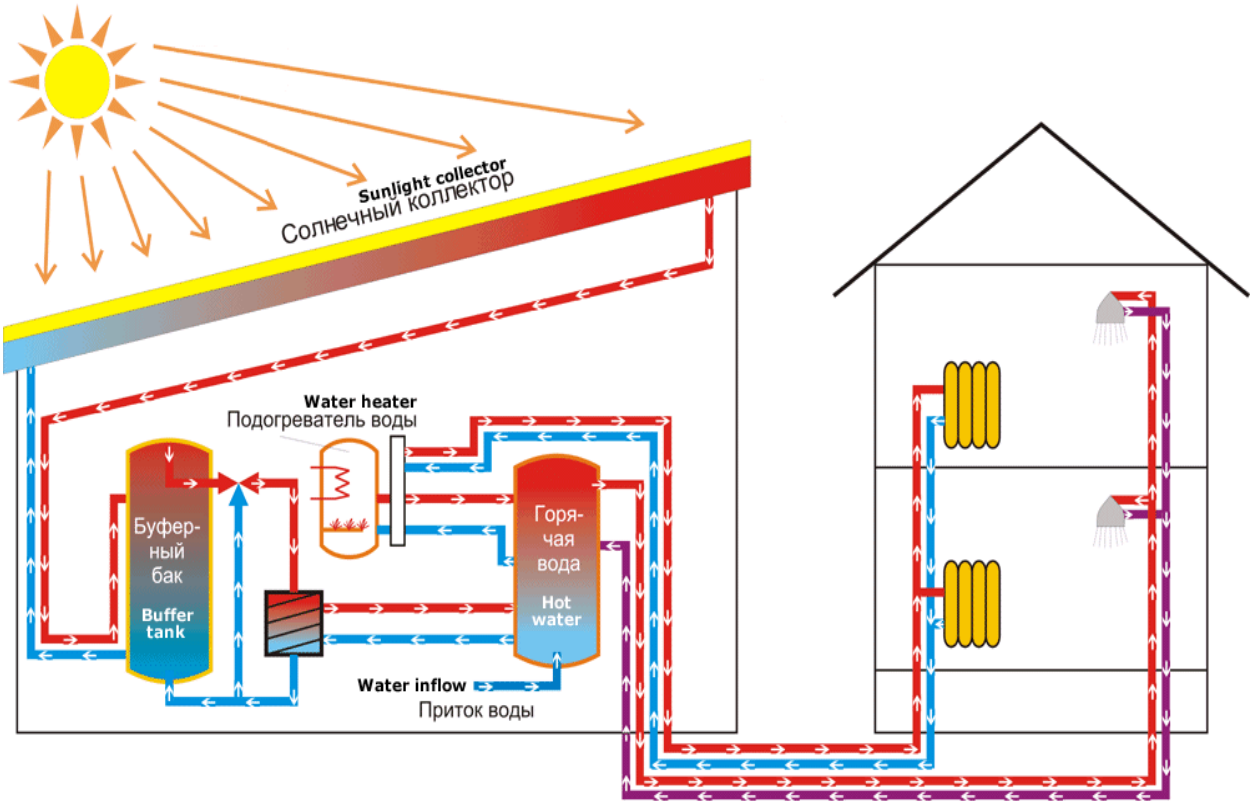
Key words: *energy resource, heat source, solar energy, solar collectors, solar absorber panels.*

Solar collectors: *what it is, where and how it can be used effectively.*

Sunlight is one of the cheapest natural resources and its use is absolutely free. In particular, solar energy can be successfully used as an alternative source for space heating. Not to mention that it is also a completely environmentally friendly form of energy that does not harm the planet and its inhabitants. Surprisingly, this idea began to be actively developed only in the last few years. Therefore, the sale of solar collectors is still an almost unoccupied segment of the market. What is a "solar collector", what types of it are available today and can it actually be effective - we will understand in this article.

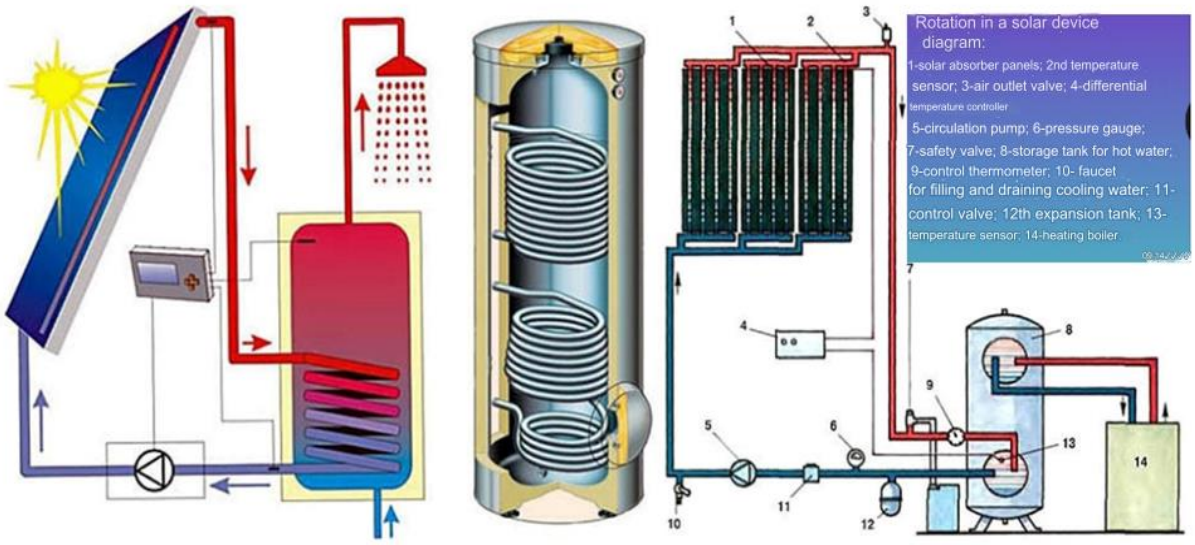
How to effectively use solar collectors

Every day, the earth receives a huge amount of energy, radiation from the Sun, most of which is not used in any way. If you believe scientists, then every day the Sun "gives" the earth an amount of energy comparable to the energy spent by all mankind during the year. The main function of a solar collector is to absorb the sun's rays and then convert them into thermal energy. Officially, a collector can be considered any container (barrels, buckets and even banal plastic bottles) with a liquid exposed to the sun. But we will definitely not consider such options, because heir efficiency is very low.



Features of the device and algorithm of operation of the collector The device of this device consists of structural elements such as the collector itself, a heat exchange circuit and a heat battery (a container filled with water). The principle of operation is very simple and understandable: water is heated, absorbs energy from solar radiation, and then circulates and gives heat to the exchanger. Heated water is stored in the tank until it is used, so it is important to insulate it well. The most modern models of the devices, as a rule, are additionally equipped with a forced circulation pump and an electric heater - a doubler in long-term unfavorable and cloudy weather conditions. Advantages and disadvantages of collectors as a source of room heating

As a method of heating buildings, solar collectors are not yet used as often as possible, but they are already in this field



Advantages

1. You do not need special permits to install a solar collector on your roof. Only a qualified and experienced plumber is needed.

2. Long-term effective operation

3. The life of the collector is 15 years.

4. Energy independence

5. By installing a solar collector, you will significantly reduce your reliance on gas heating. In the summer, as well as in the off-season, you will always have hot water at home, and the consumption in the boiler will be significantly reduced.

Disadvantages

The cost of the necessary equipment In the modern market, the minimum cost of one solar energy collector is 500 US dollars. The installation of the switch system is on average 2500 cubic meters. In addition, the collector definitely needs a

storage tank for efficient operation. If it is not initially provided on your system, then you will have to opt out of it. The main and biggest disadvantage of solar collectors is the high price.

Variability

Solar collectors can be considered only in the context of an additional heating source, which allows you to save a little on gas consumption at certain times of the year. So, for example, in winter, the collector is completely ineffective.

Classification of solar collectors

According to the principle of seasonality:

throughout the year (for this, additional elements must be installed in the collector - a pump and a heater)

seasonal (summer and off-season)

According to the principle of work:

with forced circulation (operates under pump pressure)

gravity (you don't need electricity for their operation, which is ideal for summer living and to save in general)

By designated area:

for heating buildings

for heating water in pools

By type of design device:

tubular vacuum flat.

Tube vacuum

Tubular vacuum collectors consist of a frame, heat exchanger housing and glass tubes. Pipes may be different. Now manufacturers offer models with coaxial tubes, U-type and feather tubes of the heat-pipe system.

Flat solar collectors

Flat solar collectors are a box (housing) covered with glass. The main structural element in such a system is a metal plate covered with a dust absorbent - a special solar energy absorbing compound. Also, a water circulation pipeline is soldered to the plate.

It is difficult to say which type of collector design is better. Each of them has both advantages and disadvantages: flat collectors are cheaper than vacuum ones;

the flat design is considered more durable and reliable, while the vacuum is fragile;

it is advisable to use flat in summer and off-season, vacuum - in winter;

it is problematic to install a flat collector on a hard-to-reach roof of a complex design;

vacuum type system is more efficient in heating water to high temperature;

if the flat collector is broken, it will need to be completely replaced, if the vacuum is broken, only the part that has failed will need to be replaced.

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