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DOMESTIC HEATING DESIGN PRINCIPLES

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Анотація

Ця стаття пов'язана з сучасними принципами розробки внутрішньої системи опалення і пояснює, як всі частини працюють разом, щоб отопити будинок. Система опалення, це складна мережа різних пристроїв, яка проектується та встановлюється групою висококваліфікованих фахівців.

Ключові слова: внутрішня система опалення, мережа різних пристроїв, проектується, група висококваліфікованих фахівців.

Abstract

This article is concerned with the modern domestic heating system design principles and explains how all parts of it work together to heat the house. Heating system is a complicated net of different devices, which have been designed and installed by a group of highly qualified specialists.

Keywords: domestic heating system, net of different devices, designed, a group of highly qualified specialists.

Introduction

Since the ancient times people have tried to heat their homes in different ways. Some of them were very primitive and energy-consuming, just imagine the inconvenience of having to light a wood and coal fire in every separate room to keep your house warm. Fortunately, now we have a lot of special tools and equipment to make a system which heats buildings without waste of energy sources or heat.

Research results

The basic idea of domestic heating is really simple: you have a boiler or furnace, fueled by gas, oil or electricity in a handy place like your kitchen or bathroom and it uses water, moved by an electrically powered pump, to carry heat into radiators in all the other rooms.

Let us describe the principle of work of furnaces. Fuel comes inside a gas- or oil-fired furnace, it is mixed with air and burned. The flames heat a metal heat exchanger where the heat is transferred to air. Air is pushed through the heat exchanger by the "air handler's" furnace fan and then forced through the ductwork downstream of the heat exchanger. At the furnace, combustion products are vented out of the building through a flue pipe. Older "atmospheric" furnaces vented directly to the atmosphere, and wasted about 30% of the fuel energy just to keep the exhaust hot enough to safely rise through the chimney. Current minimum-efficiency furnaces reduce this waste substantially by using an "inducer" fan to pull the exhaust gases through the heat exchanger and induce draft in the chimney. Condensing furnaces are designed to reclaim much of this escaping heat by cooling exhaust gases well below 140°F, where water vapor in the exhaust condenses into water. This is the primary feature of a high-efficiency furnace (or boiler). These typically vent through a sidewall with a plastic pipe.

Heating system controls regulate when the various components of the heating system turn on and off. The most important control from your standpoint is the thermostat, which turns the system on and off to keep you comfortable. A typical forced air system will have a single thermostat. But, there are other internal controls in a heating system, such as high limit switches that are a part of an invisible but critical set of safety controls.

As for boilers, they are special-purpose water heaters. While furnaces carry heat in warm air, boiler systems distribute the heat in hot water, which gives up heat as it passes through radiators or other devices in rooms throughout the house. The cooler water then returns to the boiler to be reheated. Hot water systems are often called hydronic systems. Residential boilers generally use natural gas or heating oil for fuel.

In steam boilers, which are much less common in homes today, the water is boiled and steam carries heat through the house, condensing to water in the radiators as it cools.

If you want to heat the building using environmentally friendly source of energy, the best way is to use electric heaters. They convert electric current from the wall socket directly into heat, like a toaster or clothes iron. "Electric baseboard heat" is yet another kind of resistive heating, similar to a plug-in space heater except that it is hard-wired. It has two principal virtues: the installation cost is low, and it is easy to install individual room thermostats so you can turn down the heat in rooms that aren't being used.

In modern design of home central heating the system called radiant floor heat is often used. It circulates warm water in tubes under the floor. This warms the floor, which in turn warms people using the room. It is highly controllable, considered efficient, and is expensive to install. It also requires a very experienced designer and installer of the system.

Conclusions

It can be concluded that domestic heating is very important thing in our life. People designed such a difficult system to make heating easy and more productive. It brings warmth into our homes, provides coziness and comfort. We cannot do without central heating in modern world. The newest heating systems significantly save resources, they are more convenient to use, they are generally small and look more aesthetically pleasing.

СПИСОК ВИКОРИСТАНОЇ ЛІТЕРАТУРИ

1. Smart House [Електронний ресурс] / Режим доступу: – http://smarterhouse.org
2. Explain that stuff [Електронний ресурс] / Режим доступу: – http://www.explainthatstuff.com/gasboilers.html

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