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Central Heating System Optimization

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Abstract: Optimization of a building, the only requirement is to promote the welfare and quality of life without increasing costs. Among the components of energy consumption in buildings, heating systems that use more fossil fuels. Are major consumers of energy, because 70% of Iran's natural gas consumption is allocated to heating buildings. Due to various factors that contribute to the building heating energy consumption, the guidelines provide savings in buildings and reducing energy consumption in the domestic sector, will affect the frequency. Climate and weather, architecture, building, building materials, efficient heating systems, using equipment with the capacity required, the amount of time in building thermal control systems are effective and also efficient heating of the heating energy consumption are considered. In this paper a complete analysis system, central heating we are.

Key words: central heating, heating systems, optimal energy.

INTRODUCTION

In central heating systems, heat is needed in all parts of the building is produced and distributed to devices such as radiators, fan coil, the channel needed to be sent. Central heating systems work based on a source of heat energy is transmitted to various parts of the building. For heat transfer, the fluid medium such as water, steam or air carrier is necessary that heat is the energy source and heating devices. Central heating systems, all with a boiler or hot water boiler are. Differences between different systems is central heating in their endings, which can be aluminum or steel radiator, fan coil, air conditioner or fan coil is the channel.

Thermostatic radiator valves:

Fuel is needed to optimize the system's radiator is equipped with a thermostatic valve. Thermostatic radiator valves with adjustable temperature by a thermostat can maintain a constant room temperature at the desired temperature and adjusting room temperature in the range of 21-18 ° C obtained the highest saving in fuel consumption. Therefore, unnecessary increases in each of C and room temperature, reduces fuel consumption rate is 6%.

Thermostatic valve of a thermal sensor (thermostat) for automatic temperature control, in which the radiator is installed and the valve from the sensor, is formed. Required temperature in each room, twisting the cap is adjustable thermostat. Room temperature when the heat output from the radiator or any external heat source (such as solar radiation, increasing the number of residents and equipment, and appliances) and the increase in the temperature range thermostats are set, the thermostat valve and flow control hot water in the radiator and reduces the room by the radiator to prevent heat gain. In addition to providing optimal comfort for residents, reducing energy consumption and fuel costs will also meet. If the thermostatic valves on radiators do not use, in case the room air temperature increase until the room conditions are unfavorable. Residents in the room to open the window and this will cause the cost paid by the warm air out the house and goes to waste. Thermostatic radiator valves buying and installation costs during the cold period, saving the cost of fuel will be returned.

Components such as sensors, thermostat, adjustable cap index, and spring is formed. Sensors with a variety of liquid, gas and wax (wax) that are each with its own technology and the effectiveness of the temperature sensor and a liquid or gas within it expands or contracts in effect on the milk, water inflow to the radiator control are.

For the best possible way the thermostat will sense the temperature in the radiator or angles in the chamber is limited or it is placed on the cover of the thermostat with external sensor is used. The thermostat according to the sensor can be up to 8 meters away from the radiator. Index and temperature of the thermostat and radiator installed and the type, amount and the actual temperature determines the final. (Figure 1).

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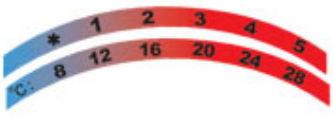

Fig. 1-3: on the thermostat and the temperature oC 21 causes ambient air to be desired.

In addition, some thermostats to regulate temperature, at least, it completely stopped the flow of hot water (0) is also available. In public places and environments that need to maintain a specific temperature or a temperature range of ambient temperature is, the thermostat can be used with the limited sensors. By the thermostat temperature can be set to limit the minimum and maximum temperature and temperature may not be possible. The thermostat can also be used for the lock to prevent theft. Thermostatic radiator valves to adjust the temperature by a thermostat so it is possible to provide various cross currents. Ability to regulate the water flow (Presetting) that if the valve is equipped with this system, the change of surface water flow and pressure drop, limiting the maximum water inflow to the radiator.

In buildings with central hot water system to the floor height or distance from the central heating units, heat distribution was not uniform in all places, the unit near the engine room to room to escape from the heat of the windows are open and the units or In the upper classes, equipment and facilities used for heating the side altogether. Thermostatic radiator valves can be used in this case that are equipped with the system initialization, the various streams of water in the radiators of different classes. For optimal efficiency and reduction of the thermostat to heat the milk and air around the radiator pipes and the surface of the radiator thermostatic valve, the thermostat must be installed horizontally. For this purpose, and according to the position of radiator water inlet pipes, the valves under the terms of the conditions are different.

Angled valve:

When the water inlet pipe to the radiator from the rear wall.

Right-angled valve:

When the water inlet pipe to the radiator and the radiator of the land is

Angular Left valve:

When the water inlet pipe to the radiator and the radiator is of the earth.

Reverse angled valve (UK):

This model is applicable for all cases above the horizontal difference between the thermostat and the radiator will be extended. (In three cases before the thermostat was placed horizontally, but vertically along the radiator.)

Milk straight:

When the water inlet pipe to the radiator side of the wall directly into the radiator.

To achieve 20% fuel saving thermostatic radiator valves should be of international standard (EN-215) have obtained.

Thermostatic radiator valves of the benefits include:

A - to establish stable at room temperature B - set the desired temperature in the room to provide comfort C - lower amortization heating D- Possibility of establishing a balanced distribution of heat and different temperatures in each room E - 20% reduction in fuel consumption and related costs

Intelligent control system for engine room:

To set the water temperature in the engine room of the building used for heating and ordinary thermostat is adjustable by the operator on the room temperature are preferred. Based on set point to take the torch off and running, the main disadvantages of these thermostats react to changes in outside air and functional status at different hours of day and night. If the ambient air temperature, reduce the heat requirement of buildings, rooms with high temperatures and heat works more than is required to enter a building that is virtually no waste. In the office buildings at night and the room to its continues to produce heat. To resolve this problem, the use of intelligent control systems with the ability to schedule hourly and weekly room and equipped with temperature sensor, is recommended. The multi-sensor system with the external environment, external water tube boilers, burners and boilers are measuring the temperature, the temperature of hot water needed for the building (or turn off the burner) so that the hot water needed The building is secure. The building needs heat energy is produced and the production of excess heat is

prevented. Intelligent control systems room is their ability to plan and work through these buildings can be identified. The only room in the building where people are present or where it is needed, is established. The days and times when the buildings (usually office buildings and commercial) is empty, silent room, and a considerable saving in fuel consumption and related expenditures occur.

The benefits of intelligent control systems for machine rooms are:

A - reduced fuel consumption and costs by 40 percent in non-residential buildings (office and commercial) and 15% in residential buildings

B - lower amortization components of the engine room and mechanical efficiency, and safety factors

C- providing the comfort of residents, with exterior temperature

D - software allows the system depending on the type of building

E - The low cost and short-term return on investment due to a significant saving in fuel consumption

Motor Home:

The low efficiency of the engine room includes:

A - incomplete mixing of fuel and air are the result of incomplete combustion (burner fuel and air in this room cannot be completely mixed together, so in some cases, for they shall be added air required for combustion air supply must be raised)

B - Lack of flexibility in changing atmospheric conditions and engine room and working conditions (lack of intelligent environmental control system installed in the engine room and boiler burner, which makes the environmental conditions of optimum efficiency and fall off.)

C - Non-seasonally adjusted and increased fuel efficiency is a severe reduction in Motor Home

D - Design and motor homes with new technologies that save energy issues in their terms is not

Why waste energy in the room include:

A - not a good burner (not adjusted properly and in some cases, low efficiency) B - not suitable for pot (and there is no insulation in the sediment inside the blades) C - the proportion of thermal capacity of the boiler burner D - not the clean room E - not for the wrong chimney and plumbing design F - non compliance with the thermal load capacity building, room temperature G - set the thermostat correctly

Optimization of operating room include:

A - intelligent environmental control system installed in engine room B - the engine room C - compliant boiler and burner D - barometric damper installed E - pipe insulation and boiler F - washing pots and Deposition

5 - Duct and heat exchangers:

Duct have a critical role in energy conservation, the air duct and ventilation have been rocky for a room cooler in summer than it would if this transfer duct will cause the air conditioning was not doing well wasted. As a result, energy consumption will increase. Not cool the house well. Duct is made of metal plates, fiber glass or similar materials are made. Air conditioning duct that is placed on the transfer, the air is not being wasted, they have a hole in the duct is in the air around the falls, the air conditioning is cooling the air with energy, so Air expensive and must be used correctly, it is pierced with a duct or air will leak from it, in fact, this is money that can leak from the hole and this is a huge amount of money each year. What the duct system is designed for a home more seamless and efficient, energy consumption will be lower. Compared to the same level of welfare and quality of building ventilation will too. Duct, if it be well insulated, heat exchange will be less. The air will move further adjusted. Optimization of a building, the only requirement is to promote the welfare and quality of life without increasing costs. Channels alone is not enough insulation, but the wall must It is located in the duct insulation, otherwise the wall Energy to pass easily from that, no matter how the insulation Be done better, and optimize system efficiency is higher. Increasing efficiency Significantly reduce subscription costs of electricity and gas will result in any The cost of building insulation that is economically justified and its cost will be offset Was.

The way they passed through the duct walls The items include air conditioning, air conditioning Like it or not part of the energy Duct these wastes, the better the energy wasted in the walls in the environment Are ventilated, the walls of the air temperature at least be balanced, in some cases Select routes that allow the duct to pass through there, you choose the path If that is closer to the ventilation of rooms. Air cooling is better on a moisture-retentive Outside air ventilation duct of the transmitter to be taken up by the excessive Not the moist, humid air over a variety of fungi and mold growth Reduce the health and home.

Heat pumps:

There are two common types of heat pumps:

A - air source heat pumps B - source of geothermal energy with heat pumps (GHPs

Both types of heat pumps in the winter can keep cool in summer and warm home environment. With a heat pump air source, heat from the air will move indoors to outdoors. In summer the heat from indoors to outdoors to allow the air.

Source heat pump with a geothermal energy, heat from the house, making out in the hot season, but in the winter and winter heat energy from the earth to move home and thus making the house temperature at 50 to 60 degrees Fahrenheit to maintain communicate.

Most heat pumps are air-source heat pumps from residential areas. An air source heat pump can provide the high-efficiency heating and cooling your home, especially if you live in hot climates. Heat pumps can be 5 / 1 to 3 times more efficient than electric systems have.

A heat pump, heat rather than converted from one form to another form to make so that the means for converting heat energy to make fuel, waste less energy and therefore will have higher efficiency.

Package central gas condensation Wolf-MGK:

The problems in the engine room and optimizing energy consumption in the room, Packages central Wolf-MGK gas condensate can be good. The standards DIN EN 437, DIN EN 483 and DIN EN 677 are designed and produced. MGK packages equipped with intelligent energy management system capable of planning and control with automatic ignition and modulation capabilities (between 17 to 100 percent full time) and are capable of supplying energy requirements kW 23 MW 1.2 is up. Package of benefits including gas central condensation include:

A - Connect the modular capability to provide output power up to MW 1.2 B - with maximum efficiency to 110% for complete combustion to reduce emissions C - Advanced control systems for all types of heating systems in buildings D - equipped with a heat exchanger efficiency of aluminum alloy - silicon, Durable, no precipitation and the need for maintenance E - light weight and high power output F - increasing the water temperature is not necessary to package G - no need to establish a minimum flow of water in the boiler H - no restriction to reduce the boiler return water temperature I. - 50% saving in annual energy consumption compared to conventional motor homes.

System Combined heat and power (CHP):

Both electricity and heat production system, capable of supplying electrical energy to kW 30 kW 360 and comply with environmental standards and is suitable for low-volume office environments, is a teaching hospital and residential. In this system, a four-stroke gasoline engine, generator, heat exchangers and advanced control system made with 90% efficiency of electricity and provide heat for buildings.

CHP system benefits include:

- KW 360 kW 30 to the electric power and heat energy from the kW 489 kW 60
- Equipped with an intelligent engine management system to increase efficiency and reduce engine wear
- Control at the time of peak consumption
- High confidence in the supply of electrical energy
- Capable of continuous operation and long life
- Modular power supply and electrical connections to two kW 720
- Capable of operating up to 50% electrical equipotent
- Designed for ease of installation and inspection service in the shortest time possible
- Ability to work with a variety of fuels such as gasoline, gas oil and biomass
- Energy conversion and control unit for fully automatic with no need for the national grid operator

Conclusion:

In public places and environments that need to maintain a specific temperature or a temperature range of ambient temperature is, the thermostat can be used with the limited sensors. If the ambient air temperature, reduce the heat requirement of buildings, rooms with high temperatures and heat works more than is required to enter a building that is virtually no waste. MGK packages equipped with intelligent energy management system capable of planning and control with automatic ignition and modulation capabilities (between 17 to 100 percent full time) and are capable of supplying the energy needs of the MW 1.2 kW 23 to. System Combined heat and power (CHP) of a four-stroke gasoline engine, generator, heat exchangers and advanced control systems have been established with 90% efficiency of electricity and provide heat for buildings.

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