References

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Uponor involvement

500sqm

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Changzhou Tian'an Villa is located in Wujin District of Changzhou City. With a total construction area of about 500㎡, this Project adopts a full set of Uponor radiant air conditioning system, which includes ground radiant system, ceiling radiant system, hydraulic conveying system, air conditioning automatic control system and fresh air dehumidification system. Uponor Engineering Department is responsible for the whole project's conceptual design, product procurement, construction guidance, quality supervision, and system debugging.Owners, based on a preliminary understanding of the radiant system, can put forward their requirements on thermal comfort, indoor air quality, noise, airflow distribution, temperature and humidity control, future maintenance and other aspects.

1. Unlike traditional convection air conditioning (fan coil unit, air-air conditioning, etc.), radiant heat exchange makes up about 60% of the radiant system and the amount of body heat dissipated by radiant is largely increased, which is quite similar to what ASHRAE describes as human body heat exchange comfort model: 30% convection heat exchange, 45% radiant heat exchange and 25% evaporation heat exchange. Moreover, the radiant system could also reduce or increase the temperature of surrounding walls accordingly to cooling or heating conditions, so as to further improve the comfort and friendliness of indoor environment.

2. Compared with terminal equipment of traditional air conditioning that involves a lot of condensed wet surfaces, which may cause the condensate water pan to breed a large number of bacterium and seriously endanger human health, Terminal equipment of radiant conditioning is free of wet surface, and indoor humidity is also strictly controlled, which is conductive to improving the cleanliness of indoor air.

3. Terminal of radiant air conditioning is free of any moving parts, thus eliminating the indoor noise source fundamentally, and further creating an extremely pleasant and wholesome environment for the customers to live in.

4. For most people that have long been subject to air conditioning environment, it is likely for them to suffer the so-called "Air Conditioner Syndrome",which is mainly caused by insufficient fresh air indoor, growth of mould in air conditioning system, long-term blowing feeling and so on. As mentioned above, radiant system can fundamentally eliminate the three hidden dangers, and thus deserves the name as a new generation "immune air conditioning".

By adopting the high temperature cooling source, this system can also effectively reduce the operational energy consumption of air-conditioning system while improve its indoor thermal environment.Ground radiant system adopts Uponor's five-layer oxygen barrier 20mm Pex-a pipeline, so as to ensure the quality of circulating water of air conditioning, improve the heat exchange performance of cold and heat source equipment, and prolong the service life of system.Ceiling system adopts Teporis precast gypsum radiant panel, with cooling capacity of unit area in design condition reaching 85W/m^2, therefore largely eliminating users' worries about the cooling capacity of the radiant system. Gypsum radiant panel comes with an insulation layer to ensure that cooling capacity is supplied to air conditioning area to the full extent, and avoid the waste of heating and cooling capacity. Radiant panel adopts modular construction, which is easy and convenient to install, and conductive to guaranteeing the aesthetic effect of interior decoration while ensuring the effect of air conditioning.Hydraulic conveying system is composed of water mixing center, balance valve and main transmission pipeline. Uponor water mixing center well integrates the control module, electric three-way valve and circulating water pump, which ensures the allocation of hydraulic system on demand and on time, and realizes the efficient operation of hydraulic system intelligently.Air conditioning automatic control system adopts a full set of Wave Plus+ Move Plus wireless control system, which helps to eliminate the wiring process of conventional control system, and largely reduce the costs of construction and maintenance. Moreover, it also manages to link the whole indoor and outdoor equipment together organically and thus ensures the efficient and coordinated control of the whole system. Dedicated dehumidifying fresh air ventilator adopts a dual-cooling mode characterized by refrigerant + air conditioning cooling water, which not only ensures the dehumidification effect of system but also gives consideration to the energy consumption of fresh air dehumidification. Fresh air dehumidifier could also improve the air quality indoor, and control such key parameters as TVOC, PM2.5 and CO_2 concentration that are widely concerned by the public.

The whole set of radiant air conditioning system has managed to provide the owners an ideal indoor microclimate environment characterized by high comfort, high energy efficiency, high air quality, and high intelligence. And Uponor, in turn, is highly recognized and acknowledged by the owners based on their actual experiences.

Project Facts:

Location	Completion
Changzhou, China	2017
Building Type	Product systems
Single homes	Radiant Heating & Cooling, Control engineering
Project Type	
New building	

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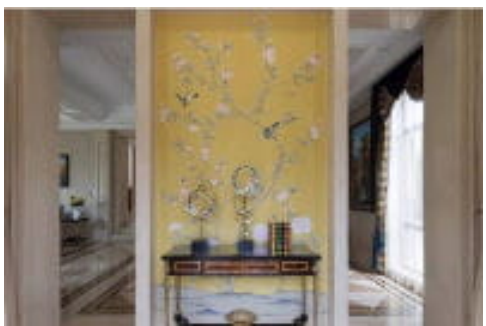





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