



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 190E219 BUILDING AUTOMATION

IV YEAR /VII SEMESTER

Unit 1- HVAC SYSTEM

Topic : Smart Sensor





Introduction



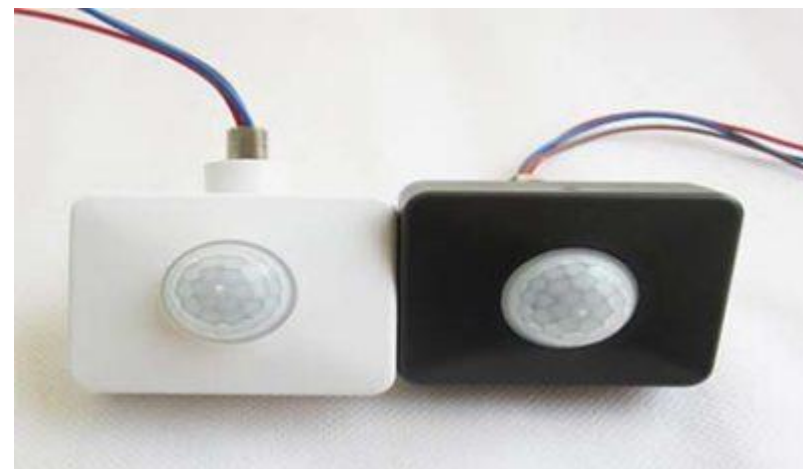
- Reconstructing the existing framework of every possible task and place with the integration of automated devices and Internet of Things (IoT) management tools is becoming the new norm in our current society.
- Laced with advanced sensor and automation technologies, smart homes, buildings and smart cities are now filling the gaps between sci-fi and reality faster than ever.



Passive Infrared (PIR) Sensors



- **What is it:** Similar to its name, PIR technology refers to the fact that PIR devices do not spread energy for detection but work by receiving infrared radiation emitted or reflected from objects. PIR sensors are typically mounted under desks, to detect when and for how long the workspace is being used.
- **How they Work:** As discussed above, PIR Sensors operate by leveraging infrared radiation that is either emitted or reflected from objects. However, PIR sensors cannot capture who exactly used the space.





Temperature & Humidity Sensors



- **What is it:** According to its name, temperature sensors can measure the temperature in the environment. This is one of the most commonly used Sensors used in Smart Buildings as they work according to the user's requirements and its position of installation. Similarly, humidity sensors measure the relative humidity in the air and are often used in combination with temperature sensors.
- **How they Work:** In simple terms, temperature and humidity sensors measure the temperature and humidity of the surrounding area within fixed intervals and if any fluctuations are seen at anytime that crosses the fixed threshold limit set in the sensor, the sensors instantly send out the signal assigned to it.





Indoor Air Quality (IAQ) Room Sensors



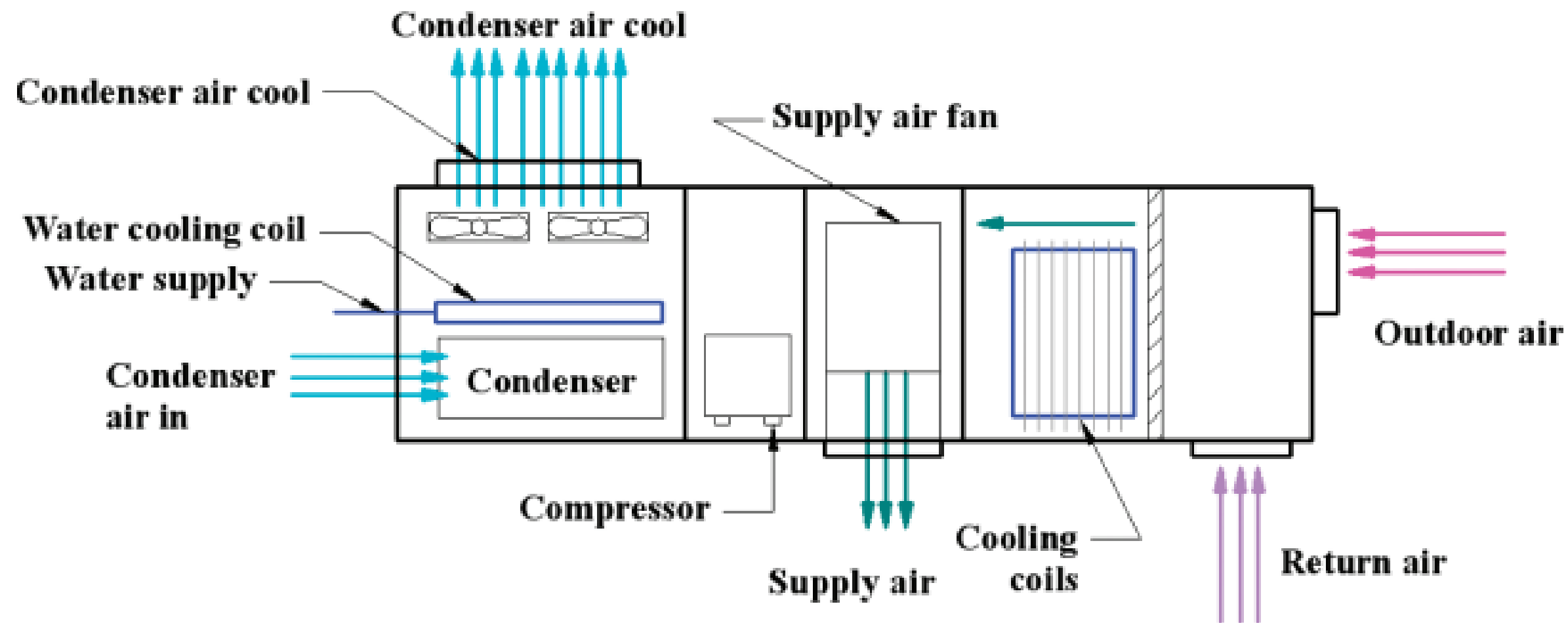
- **What is it:** Air quality sensors are typically used to monitor the concentration of pollutants in the air of the concerned area. It forms an important part of air purifiers and fresh air systems working in the facility, thus coming under the list of popular Sensors Used in Smart Buildings.
- **How they Work:** IAQ sensors deploy IoT and computer technology to configure the air quality data to collect indoor air temperature and humidity, particulate matter, TVOC, illuminance, formaldehyde, noise, carbon dioxide and other environmental factors in real-time.



Water Leak sensors

- **What is it:** Despite having regular and timely inspections in any building, water leakage from the drain systems or HVAC system is a common occurrence. The water leak sensor is a liquid leak detection device.
- **How they Work:** Considering the complex structures of the drain system, HVAC system and air conditioning system in a building, keeping a track of every gap is nearly impossible, therefore water leak sensors are often employed to give an alarm as soon as it detects a water leak.

1. Can you say this shown in fig. is the example of which method of HVAC?





References



1. Shengwei Wang, “ Intelligent Buildings and Building Automation”, Routledge 2010.
2. Reinhold A, Carlson Robert A, Di Giandomenico, “Understanding Building Automation Systems: Direct Digital Control, Energy Management, Life Safety, Security Access Control, Lightning, Building”, R. S Means company limited, 1st edition, 1991.

Thank You