SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19OE219 BUILDING AUTOMATION

IV YEAR /VII SEMESTER

Unit 1- HVAC SYSTEM

Topic : Analog and Digital Signals

Analog Signals

➢ Analog signals are continuous, variable signals that represent physical quantities such as temperature, pressure, or voltage.

➢ They can take on any value within a specific range and can change smoothly and continuously over time.

Applications

- **Temperature Sensors:** Analog temperature sensors provide continuous voltage signals that represent the temperature of a specific location or component within the HVAC system. The signal's voltage level corresponds to the measured temperature.

- **Pressure Sensors:** Analog pressure sensors generate varying voltage signals in response to changes in pressure. The voltage level provides information about the pressure level within a component like a duct, pipe, or tank.

- **Humidity Sensors:** Analog humidity sensors produce voltage signals based on the humidity level of the air. These signals can be used to monitor and control humidity in HVAC systems.

- **Analog Inputs:** HVAC control systems might use analog input signals to receive data from various sensors and sensors, helping regulate temperature, humidity, and pressure.

Digital Signals

➢ Digital signals, in contrast, are discrete signals with only two possible states: ON (1) or OFF (0). They are used to represent binary data and can be easily processed and transmitted electronically.

Applications

- **Control Signals:** Digital signals are used to control HVAC components like motors, valves, and dampers. A digital signal can indicate whether a component should be turned on or off.

- **Thermostat Inputs:** Digital signals from thermostats or sensors indicate the desired setpoint temperatures or user inputs for the HVAC system.

- **Status and Alarms:** Digital signals are used to transmit status information and alarms. For instance, a smoke detector might send a digital signal indicating the presence of smoke.

- **Communication Protocols:** Digital signals are essential for communication between different components of the HVAC system. They enable data exchange between sensors, controllers, and central management systems.

Applications

➤ **Digital Outputs:** Digital outputs in HVAC systems control devices such as relays or switches that turn components on or off based on control algorithms.

➤ **Digital Controllers:** Modern HVAC systems often use digital controllers that process digital input signals to make decisions and control system operations based on algorithms and setpoints.

➤ **Network Communication:** Digital signals are vital for communication between HVAC systems and central building management systems, allowing for remote monitoring, control, and data analysis.

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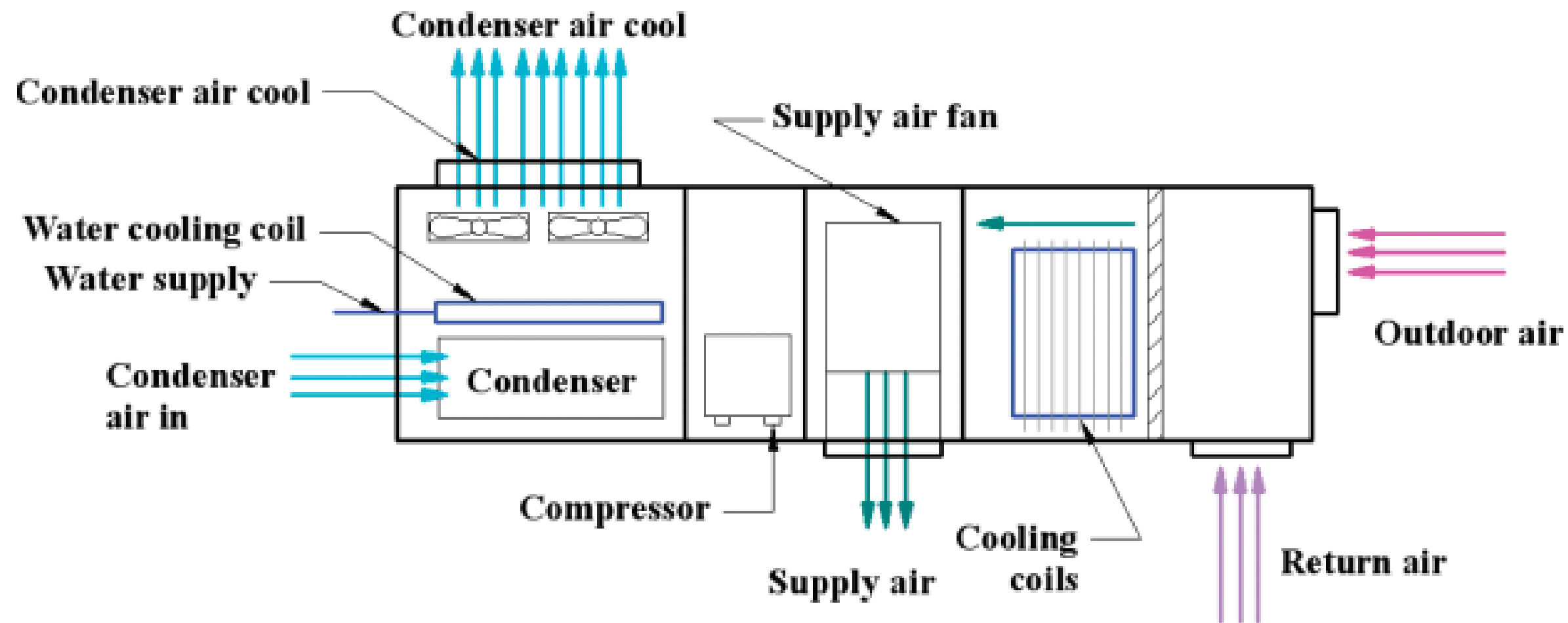
References

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