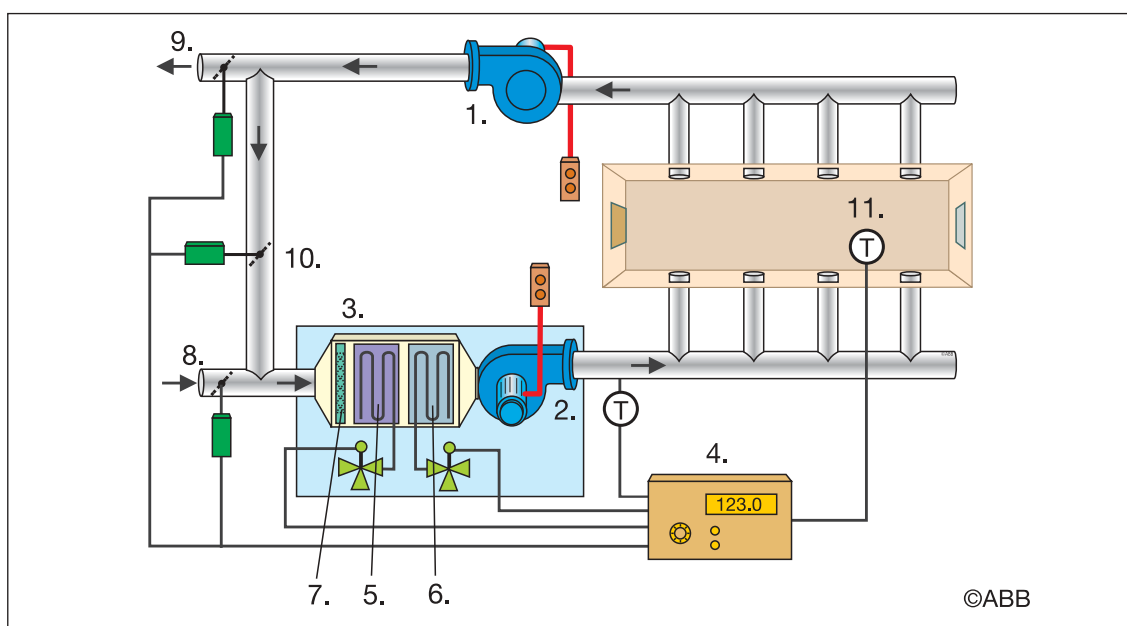


Constant air volume system - No speed control



Constant air volume system without speed control.

Application principle

The principal features of this type of system are that it is simple to design, install and operate, and it has a relatively low initial cost. All mechanical equipment is remotely located making the conditioned space quiet and vibration-free. Plant maintenance is centralized. The system may be designed so that outside air can be utilized for cooling in the cooler seasons, eliminating the need to operate the refrigeration plant. The conditioned area may be one large space or several zones for control purposes.

Room temperature can be achieved by:

- Control of refrigeration capacity.
- Bypass damper control.
- Air reheat control.
- On/Off control.

Detailed description

This typical constant air volume system brings outside air and return air to the Air Handling Unit (AHU) (3), where the temperature and humidity of the incoming air (8.) can be controlled. The main AHU components are the supply fan (2.), heating coil (5.), cooling coil (6.), filter (7.) and humidity control equipment (not shown). The three-way valves for heating and cooling are remotely operated by the control panel (4.). The supply air fan delivers the air to individual zones throughout the building through supply air ducts. Signals from temperature sensors (11.) are connected to the control panel. The return air fan (1.) delivers the exhaust air (9.) out of the building, or returns some of the air (10.) to the AHU. In this system the fans are On/Off controlled.



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Application Notes

Performance in creating the Comfort Zone

Constant volume - Variable temperature systems have dominated HVAC applications in the past for obvious reasons. Today, constant volume systems are more and more limited to applications where heating and cooling loads are constant. Such an application could be a dedicated computer room, where computers are on 24 hours a day. Control has been implemented with dampers or other mechanical control methods.

The disadvantages of these mechanical methods are:

- Slow control for maintaining Comfort Zone limits.
- High consumption of electrical energy.
- High consumption of heating and cooling energy.
- Difficult to keep a low level of noise.
- High maintenance cost due to frequent starting and stopping of motors.



Overhead air conditioning ductwork in a factory.

HVAC



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