

Frequently asked questions about CBECC-Com 2019 modeling for California’s 2019 Building Energy Efficiency Standards, Title 24, Part 6.

Q: How are mechanical systems defined in the energy model?

Air System and Zone System are the two pathways for modeling mechanical systems in CBECC-Com. This aid provides descriptions for each type within each system to help modelers with the selection process.

Air Systems

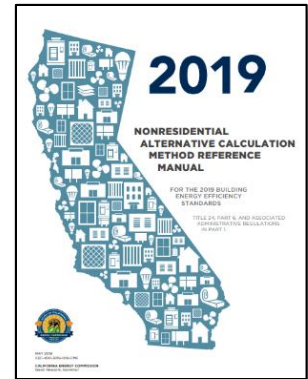
Air Systems can serve multiple zones, and provide more flexibility to model control sequences and strategies. The following Air System types can be modeled in CBECC-Com.

DOASCV <i>Dedicated Outside Air System, Constant Volume</i>	A constant air volume 100% outside air system.
DOASVAV <i>Dedicated Outside Air System, Variable Air Volume</i>	A variable air volume 100% outside air system. Provides more control options (occupancy variations, airflow reduction, etc.) vs the DOASCV system.
Exhaust	Exhaust Only. Centralized, but no supply, heating or cooling.
HV <i>Heating & Ventilation</i>	An example is a Makeup Air Unit (MAU), often providing 100% outside air, with heating, but does not provide cooling.
PVAV <i>Packaged Variable Air Volume</i>	Commonly known as a packaged VAV rooftop unit (Packaged VAV RTU) or packaged VAV air-handling unit (Packaged VAV AHU) in mechanical drawings. Zone terminal units have reheat.
SPVAC/SPVHP <i>Single Packaged Vertical Unit Air Conditioner/Heat Pump</i>	An air-cooled packaged system where its major components are arranged vertically.
SZAC/SZHP <i>Single Zone Air Conditioner/Heat Pump</i>	A constant volume air conditioner/heat pump (reverse cycle refrigeration) with heating and cooling coils. The system can serve multiple zones, but can only have one control zone.
SZVAVAC/ SZVAVHP <i>Single Zone Variable Air Volume Air Conditioner/Heat Pump</i>	A variable air volume air conditioner/heat pump with heating and cooling coils. The system can serve multiple zones, but can only have one control zone. Zone terminal units don’t have reheat.
VAV <i>Variable Air Volume</i>	The system has a chilled water coil, hot water coil. This is a water-cooled system, having a condenser loop. Zone terminal units have reheat.

Zone Systems

Zone Systems have fewer inputs, and can only serve one zone. The following Zone Systems can be created in CBECC-Com.

Baseboard Exhaust <i>Zone Level Exhaust Only</i>	A zone system with a heating coil. One example is a residential bathroom application.
FPFC <i>Four Pipe Fan Coil</i>	A system consisting of a fan, hot water coil, and a chilled water coil. The fan can be two-speed.
Furnace MiniSplitAC/MiniSplitHP <i>A Zone Level Split System</i>	A zone system with gas-fired or electric heating. This DX system consists of an outdoor compressor/condenser and an indoor evaporator.
PassiveBeam <i>Passive Beam</i>	Commonly known as “chilled beams”, a passive beam provides cooling by having chilled water pass through the tubes (heat exchanger), creating convective air motion without the use of a fan.
PTAC/PTHP <i>Packaged Terminal Air Conditioner/Heat Pump</i>	A packaged air-cooled system that is most often placed under the window on the exterior wall, or through the window. Cooling can be DX or chilled water. Heating can be hot water, electric resistance, heat pump, or gas.
SPVAC/SPVHP <i>Single Packaged Vertical Unit Air Conditioner/Heat Pump</i>	An air-cooled packaged system where its major components are arranged vertically. Differences between the “air system SPVAC/SPVHP” and “zone system SPVAC/SPVHP” are similar to SZAC/SZHP’s.
SZAC/SZHP Single zone air conditioner/heat pump.	A constant volume air conditioner/heat pump with heating and cooling coils. The difference from the “air system SZAC/SZHP” is that as any other zone system, these can only serve one zone, cannot have an economizer, and have fewer control options. For example, the “air system SZAC/SZHP” can be a rooftop unit serving a small office with multiple zones and economizer capability. “Zone system SZAC/SZHP” may be serving a single-family residence without mechanical ventilation.
VRF <i>Variable Refrigerant Flow</i>	This DX system consists of one or multiple condensing units that circulate the refrigerant to multiple indoor units. Air-cooled VRF can be modeled in CBECC-Com.
WSHP <i>Water Source Heat Pump</i>	A heat pump system that extracts and disposes of heat from/to a water loop instead of outdoor air.



2019 Nonresidential Alternative Calculation Method Reference Manual

Find the Manual here:
energy.ca.gov/2019publications/CEC-400-2019-006/CEC-400-2019-006-CMF.pdf

Additional Resources:

CalBEM: calbem.ibpsa.us/

Energy Code Hotline: 1-800-772-3300 (Free) or Title24@energy.ca.gov

CBECC-Com: bees.archenergy.com/

Approved Local Ordinances: localenergycodes.com/

2019 NR Compliance Manual:
energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency-1

Online Resource Center:
energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/online-resource-center

Energy Code Ace: energycodeace.com

Unmet Hours
unmethours.com/questions/