

SYSTEM Type = PSZ

Packaged Single-zone with Subzone Reheat

This system and its companion (SZRH) make up more than half of all air conditioning units used by the industry. It is usually supplied with an outside/return air damped economizer mixing box, air filters, a gas or oil furnace, a DX cooling coil, a supply fan, refrigeration compressor and air cooled condenser. If the unit is very large (~30,000 FLOW) there may be a return fan. The cooling coil is direct expansion and the heating may be electric resistance, steam, or furnished by an air to air heat pump. These units are often rooftop units as there is little danger of freezing anything. Heat recovery between relief air (must use return fan) and outside air is another popular option as is heat recovery of condenser heat for reheat thus providing maximum humidity control. Subzone reheat is also seldom used but is an option. The reason that the PSZ can be used for humidity control of the control zone is that the location of the condenser coil is downstream of the cooling coil; this is not true of SZRH.

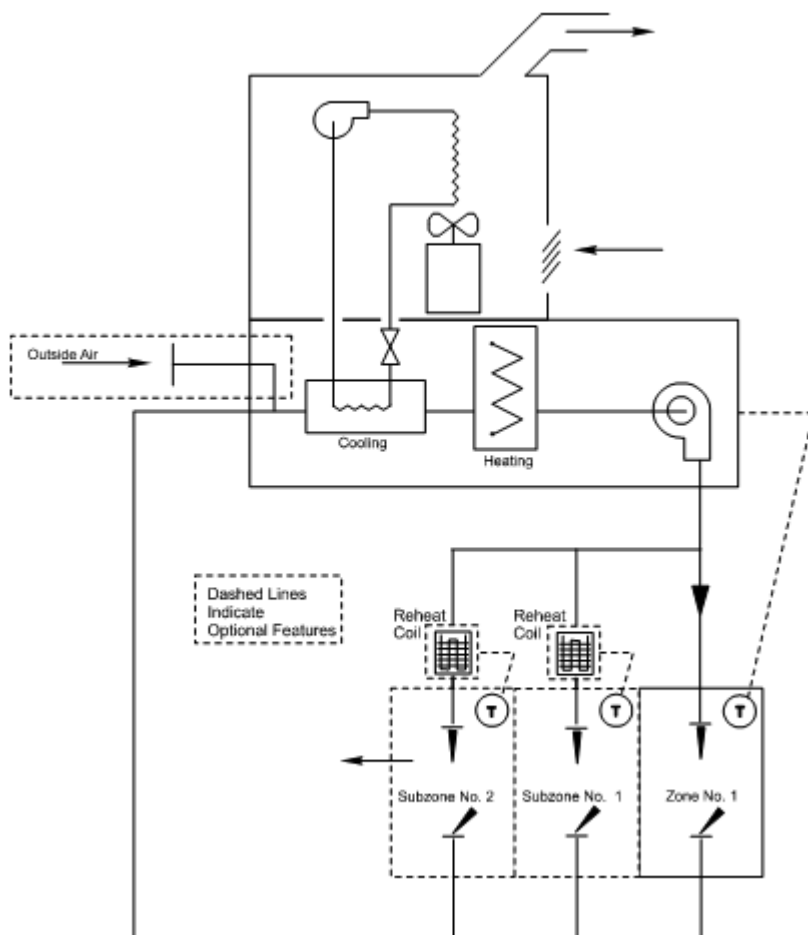


Figure 41 Packaged Single-zone Air Conditioner with Heating and Subzone Reheating Options

Other names and/or applications for PSZ

- Split system variable temperature constant-volume units
- Rooftop variable temperature-constant-volume units

- Self-Contained School Unit Ventilators
- Self-Contained School Auditorium Units
- Self-Contained School Gymnasium Units when cooling is provided
- Computer, Conference, and Meeting Room Units when humidity control is important
- Make-Up Air Units to supply; hotel/motel guest rooms with ventilation air
- Swimming pool units for humidity control
- Heat Recovery from Refrigerated Casework in Food Stores (see topic Refrigerated Casework)
- Heat Recovery from Ice Rink Refrigeration Units

Standard Temperature Controls

If you read PSZ as Packaged Single Control Zone with Subzone Reheat the unit controls are easy to understand. In your input the CONTROL-ZONE = U-NAME designates the control zone and all other zones ride with the heating/cooling demands of the control zone. Subzones can have reheat coils (often electric if the main unit is a furnace) to prevent overcooling but if subzones are undercooled, the room temperatures must suffer. The description of the control of a PSZ unit, starting with the unit on full heating, is as follows:

- On a rise in space temperature of the control zone, the furnace burners are stepped down to off.
- On a further rise the outside air economizer dampers modulate open, provided the system has an economizer and outside air can provide cooling.
- On a further rise the refrigeration compressors are stepped upward to increase the DX cooling output.

The program treats stepped control as fully modulated control and makes no attempt to differentiate between a modulated burner multiple furnace sections and for cooling the use of multiple compressors versus a single compressor furnished with unloading cylinders.

Subtopic help for this Topic:

- [Input template for a standard PSZ with furnace](#)
- [Changes or additions when using PSZ for other applications](#)
- [Covered in detail by separate topics:](#)

Input template for a standard PSZ with furnace

Under SYSTEM with suggested values

U-name = SYSTEM

Computer, Conference, and Meeting Rooms

may have humidifiers. If so, use MIN-HUMIDITY = ~25 and input correct type of HUMIDIFIER. To control humidity, input MAX-HUMIDITY = 50, MAX-CONDENSER-RCVRY = 0.6 and REHEAT-DELTA-T = 50.

Make-up Air Units to Hotel/Motel Guest Rooms

can be simulated. Input a PSZ unit with neutral supply air temperatures and apply the keyword OA-FROM-SYSTEM = to the system (like fan coils) that receives the ventilation air. For motels with indoor swimming pools the Add-On Desiccant Unit may be used to simulate a better job of moisture control; however, most use PSZ with condenser reheat.

Covered in detail by separate topics:

- Refrigerated Casework
- Defrost Controls for Heat Pumps
- Air and Water-side Economizers
- Air and Water Cooled Condensers
- Night Ventilation (SYSTEM command)
- Add-On Evaporative Cooling (SYSTEM command)
- Add-On (Integrated) Desiccant Cooling (SYSTEM command)
- Service Hot Water Heat Pump (SYSTEM and CIRCULATION-LOOP commands)
- Electric and Fuel Meters (SYSTEM, ZONE, ELEC-METER and FUEL-METER commands)
- Building Resources (CIRCULATION-LOOP command)
- Optimum Fan Start
- Heat Recovery of Relief Air
- Natural Ventilation
- Baseboard or Fin Tube Radiation
- Primary/Secondary Pumping