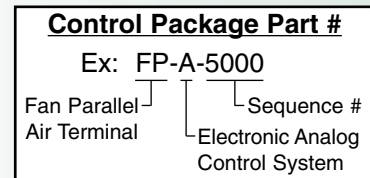


Table 59: QPT Analog Control Strategies

Control Package Number	Pressure Independent Primary	VAV Cooling	Auto Primary Heating / Cooling Changeover	CV Fan - Pressure Dependent	Electric Heat - Step	Electric Heat (Modulating)	Hot Water Heat (On-Off)	Hot Water Heat (Modulating)	EMWU - 24VAC Signal	Heat / Fan Locked Out	Night Shut-Down (Duct Press Sensing)	Night Cycling
FP-A-5000	•	•		•								
FP-A-5001	•	•		•	•							
FP-A-5002	•	•		•			•					
FP-A-5003	•	•		•				•				
FP-A-5004	•	•		•		•						
FP-A-5010	•	•		•					•			
FP-A-5011	•	•		•	•				•	•		
FP-A-5012	•	•		•			•		•	•		
FP-A-5013	•	•		•				•	•	•		
FP-A-5014	•	•		•		•			•	•		
FP-A-5020	•	•		•							•	•
FP-A-5021	•	•		•	•						•	•
FP-A-5022	•	•		•			•				•	•
FP-A-5023	•	•		•				•			•	•
FP-A-5024	•	•		•		•					•	•
FP-A-5040	•	•		•							•	
FP-A-5041	•	•		•	•						•	
FP-A-5042	•	•		•			•				•	
FP-A-5043	•	•		•				•			•	
FP-A-5044	•	•		•		•					•	
FP-A-5060	•		•	•								
FP-A-5061	•		•	•	•							
FP-A-5062	•		•	•			•					
FP-A-5063	•		•	•				•				
FP-A-5064	•		•	•		•						

• - Standard
o - Optional
EMWU - Early Morning Warm-Up



GENERAL

- If power is lost to a fan terminal with Analog controls, the electronically controlled primary damper stops at its last commanded position.
- The controller signal is determined by comparing the signals from the thermostat and flow sensor to provide the required primary airflow regardless of the inlet static pressure conditions

- Pneumatic control packages include: damper actuator and pressure independent controller. Pneumatic thermostats are not included.
- Analog electronic control packages include: damper actuator, pressure independent controller, transformer and room thermostat.

Pressure Independent Primary Flow VAV Cooling / Intermittent Fan Operation Optional Hot Water or Electric Heating

Pneumatic Control Packages:

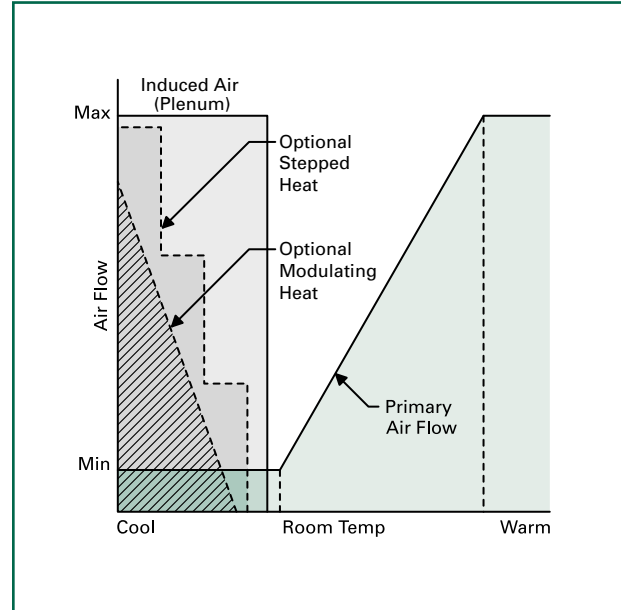
FP-P-3100, 3200, 3300, 3400

Analog Electronic Control Packages:

FP-A-5000, 5001, 5002, 5003, 5004

Sequence of Operation

As the room air temperature increases above the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the open position, up to the maximum primary airflow setting. The terminal fan remains off. As the room air temperature decreases below the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the closed position down to the minimum primary airflow setting. Upon a further drop in room temperature, the fan energizes inducing 100% ceiling plenum air. For units with heating coils, heat is then activated if the temperature continues to fall.



**Pressure Independent
VAV Cooling / Intermittent Fan Operation
with Night Shut-Down
Optional Hot Water or Electric Heating**

Pneumatic Control Packages:

FP-P-3140, 3240, 3340, 3440
(Duct Pressure Sensing)

FP-P-3160, 3260, 3360, 3460
(Main Air Pressure Switching)

Analog Electronic Control Packages

FP-A-5040, 5041, 5042, 5043, 5044
(Duct Pressure Sensing)

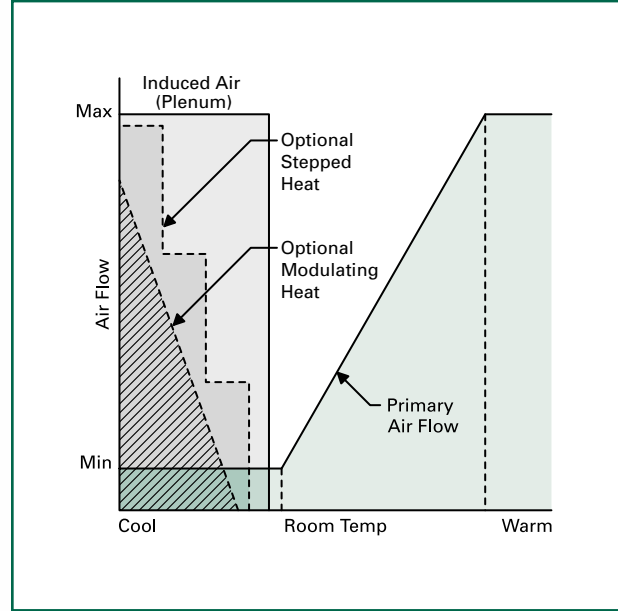
Sequence of Operation

Day Mode

As the room air temperature increases above the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the open position, up to the maximum primary airflow setting. The terminal fan remains off. As the room air temperature decreases below the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the closed position down to the minimum primary airflow setting. Upon a further drop in room temperature, the fan energizes inducing 100% ceiling plenum air. For units with heating coils, heat is then activated if the temperature continues to fall.

Night Shut-Down

Initiated via main air pressure switching (pneumatics only) or when duct pressure drops to zero (AHU OFF sensed by an air pressure switch). The fan is disabled.



**Pressure Independent
VAV Cooling / Intermittent Fan Operation
with Night Setback Mode by
Duct Pressure Sensing
Optional Hot Water or Electric Heating**

Analog Electronic Control Packages
FP-A-5020, 5021, 5022, 5023, 5024

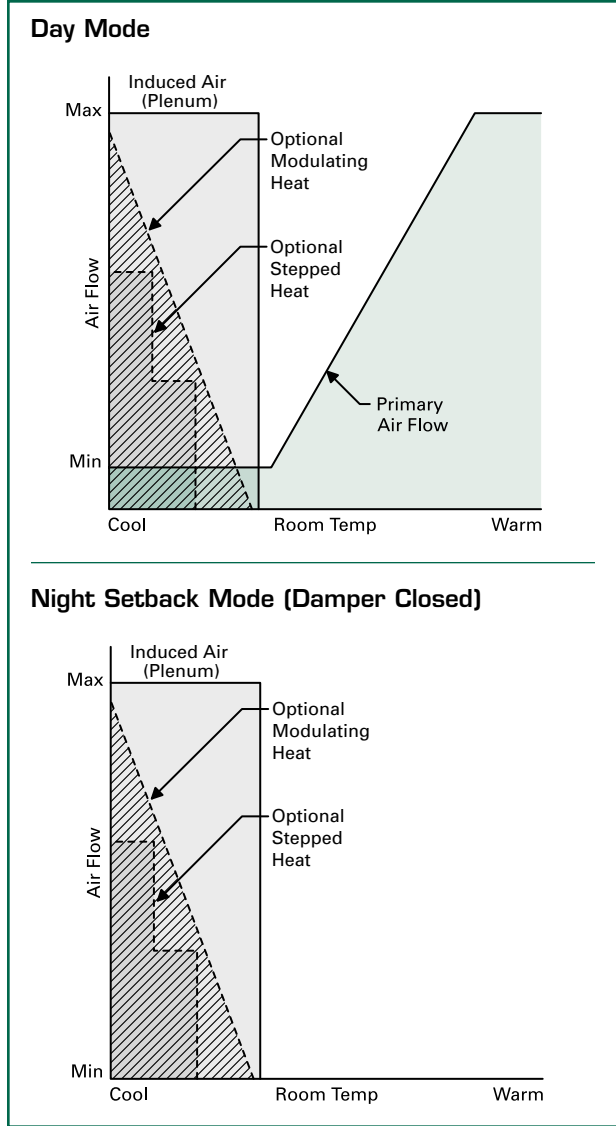
Sequence of Operation

Day Mode

As the room air temperature increases above the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the open position, up to the maximum primary airflow setting. The terminal fan remains off. As the room air temperature decreases below the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the closed position down to the minimum primary airflow setting. Upon a further drop in room temperature, the fan energizes inducing 100% ceiling plenum air. For units with heating coils, heat is then activated if the temperature continues to fall.

Night Setback Mode

Initiated when duct pressure drops to zero (AHU OFF sensed by an air pressure switch). The damper is driven closed and the terminal fan and optional heating coils are activated to maintain the thermostat setback temperature.



**Pressure Independent
VAV Cooling / Intermittent Fan Operation
with Auto Heating/Cooling
Primary Changeover
Optional Hot Water or Electric Heating**

Analog Electronic Control Packages

FP-A-5060, 5061, 5062, 5063, 5064

Sequence of Operation

Cooling Mode

(primary air temperature is below 73F)

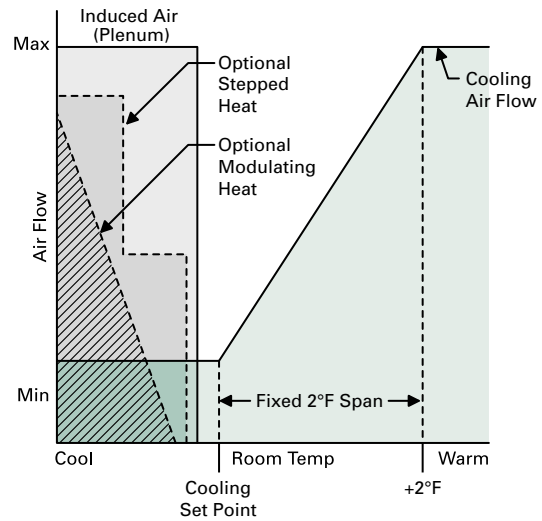
As the room air temperature increases above the thermostat setpoint, the actuator rotates the terminal damper in response to the controller signal towards the open position, up to the maximum primary airflow setting. The terminal fan remains off. As the room air temperature decreases below the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the closed position down to the minimum primary airflow setting. Upon a further drop in room temperature, the fan energizes inducing 100% ceiling plenum air. For units with heating coils, heat is then activated if the temperature continues to fall.

Heating Mode:

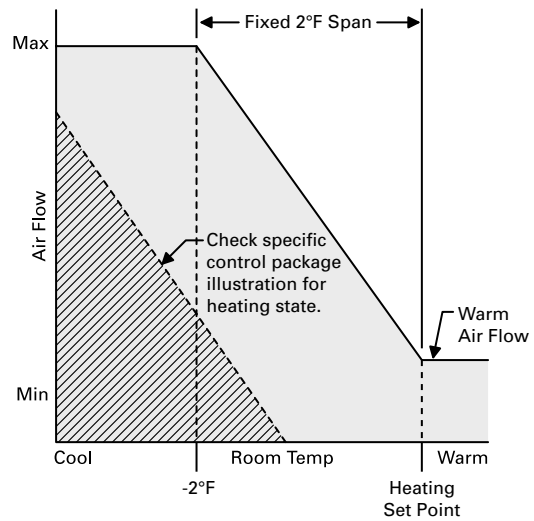
(primary air temperature is above 81F)

As the room air temperature increases above the thermostat setpoint, the actuator rotates the terminal damper in response to the controller signal towards the closed position, down to the minimum primary airflow setting. As the room air temperature decreases below the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the open position up to the maximum primary airflow setting. Fan is locked out during the heating mode. Refer to specific control package illustration to determine heating coil state during this mode.

Cooling Mode



Heating Mode (Fan Locked Out)



**Pressure Independent
VAV Cooling / Intermittent Fan Operation
with Early Morning Warm-up Mode
(24vac external signal)
Optional Hot Water or Electric Heating**

Analog Electronic Control Packages
FP-A-5010, 5011, 5012, 5013, 5014

Sequence of Operation

Normal Mode

As the room air temperature increases above the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the open position, up to the maximum primary airflow setting. The terminal fan remains off. As the room air temperature decreases below the thermostat setpoint, the actuator operates the terminal damper in response to the controller signal towards the closed position down to the minimum primary airflow setting. Upon a further drop in room temperature, the fan energizes inducing 100% ceiling plenum air. For units with heating coils, heat is then activated if the temperature continues to fall.

EMWU Mode

Initiated via a 24vac signal, the damper is positioned to 100% open. Fan is locked out during EMWU. Refer to specific control package illustration to determine heating coil state during this mode.

