

Functional Performance Test

Project Name

System: **VAV AHU System**

Tag: **AHU-**

Service: **VAV's**

<i>Functional Performance Test</i>	<i>Pass</i>	<i>Fail</i>	<i>Remarks</i>
FPT Test Prerequisites	----	----	-----
SVC forms completed and signed and dated			
Point to Point checks completed			
Point calibration completed			
AHU External Layout	----	----	-----
AHU Occupied/Running in Auto			
Access doors open against pressure			
All penetrations sealed			
Door gaskets air tight (no air leaks)			
All sections accessible (no access doors blocked)			
Construction debris removed from area			
Control panel neat/clean and free of debris			
Copper conductors only are used in control panel			
AHU is properly tagged (Plastic engrave label)			
Cooling coil condensate drains properly			
Functional Verification	----	----	-----
AHU Power Fail Restart	----	----	-----
AH Occupied in Auto			
Drive OA Min-Max/ and EA to 100% open			
Drive the RA dampers closed			
Allow time for OA dampers to fully open			
Override preheat valve closed			
Override cooling valve open			
Determine Power Fail Restart time			
Fail power to the AH control panel & VFD			
OA/EA/RA dampers to fail position in 45 sec.			
Preheat valve opens			
Cooling valve closes			
Verify communication loss alarm At workstation			
Restore power (VFD first then control panel)			
Verify fan restart delay after power is restored			
AH Fan restarts			
Place SF VFD in hand			
SF VFD continues running			

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Return SF VFD to auto			
Release chilled water valve override to auto			
Release preheat water valve override to auto			
AH Occupied in Auto			
AHU Normal DDC Shutdown	----	----	-----
AH Occupied in Auto			
Verify space temps >65 and <77			
Stop AH through DDC			
SF stops			
OA Min/Max and EA dampers close			
RA damper opens			
Cooling valve closes			
Preheat valve closes			
Lock out Supply fan at VFD			
AHU Internal Layout	----	----	-----
Coils mounted sealed and tight			
Coil section dry during summer			
Fan section dry during summer			
Filters are properly installed and clean			
Preheat coil and fins are undamaged			
Low Limit capillaries installed properly			
Cooling coil and fins are undamaged			
AH is clean inside and free of debris			
OA Min dampers fully closed and undamaged			
OA Max dampers fully closed and undamaged			
EA dampers are fully closed and undamaged			
RA dampers are fully open and undamaged			
AHU Control Device Verification	----	----	-----
Drive OA Min dampers to 100% open			
OA Min damper is fully open			
Verify OA Min damper blade seals			
Drive OA Min to 75%, 50%, 25%, 0%, verify			
Release OA Min damper to auto			

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Drive OA Max and EA to 100% open			
OA Max dampers are fully open			
EA dampers are fully open			
Verify OA Max damper blade seals			
Verify EA damper blade seals			
Drive OA Max/EA to 75%, 50%, 25%, 0%			
Release the OA Max/ EA dampers to auto			
Verify RA damper seals			
Drive RA damper 100% open			
RA damper fully opens			
Drive RA damper to 75%, 50%, 25%, 0%			
Release RA damper to auto			
Drive Preheat valve to 100% open			
Drive Preheat valve to 75%, 50%, 25%, 0%			
Release Preheat valve to auto			
Drive F/B Damper to 100% open to coil face			
Drive F/B Damper to 75%, 50%, 25%, 0%			
Release F/B Damper to auto			
F/B Damper returns to open			
Drive Cooling valve to 100% open			
Drive Cooling valve to 75%, 50%, 25%, 0%			
Release Cooling valve to auto			
Command Cooling coil circulation pump to On			
Cooling coil circulation pump starts			
Confirm pump On status at workstation			
Release pump to auto			
Cooling coil circulation pump stops			
Confirm pump off status at workstation			
Close and latch all access doors			
Return SF VFD to auto			
Start AHU in auto occupied mode through DDC			
Safety And Limit Verification	-----	-----	-----
Simulate OA-Temp at 37°F			
Cooling coil circulation pump starts			
Confirm pump On status at workstation			

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Verify both low limits are set @ 35°F (adj)			
Activate 1 low limit			
SF stops			
OA/EA/RA dampers to fail position in 45 sec.			
Cooling Coil Valve closes			
Verify low limit alarm at the workstation			
Record the current preheat setpoint _____			
Change Preheat setpoint to current PH-T +10°F			
Preheat valve opens under Temp control			
Return Preheat setpoint to original value (53°F)			
Place SF and RF VFD's in manual			
SF and RF VFD's Remain off			
Return SF and RF VFD's to Auto			
Reset low limit			
Fan system restarts			
Low limit alarm clears at the workstation			
Allow time for OA dampers to fully open			
Activate 2 nd low limit			
SF stops			
OA/EA/RA dampers to fail position in 45 sec.			
Cooling Coil Valve closes			
Preheat valve remains under Temp control			
Verify low limit alarm at the workstation			
Place SF and RF VFD's in manual			
SF and RF VFD's Remains off			
Return SF and RF VFD's to Auto			
Reset low limit			
Fan system restarts			
Low limit alarm clears at the workstation			
Allow time for OA dampers to fully open			
Duct high pressure safety set for 3.5"WC (adj)			
Duct High Pressure limit is piped properly			
Activate Duct high pressure safety			
SF stops			
OA/EA/RA dampers to fail position in 45 sec.			
Cooling Coil Valve closes			

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-----	----	----	-----
Sequence Verification	----	----	
AH Static Pressure Control			
Verify that AH is in occupied mode			
Record the Static pressure setpoint	----	----	_____ "WC
Record actual duct static pressure	----	----	_____ "WC
Record SF / RF VFD speed	----	----	SF=_____ % RF=_____ %
Decrease static pressure setpoint by 0.3"WC			
SF VFD decreases speed to new setpoint			
Return static pressure setpoint to original value			
SF VFD increases speed to original setpoint			
AH Mech Clg/ Minimum O.A. Control	----	----	-----
Simulate OA-T to 73°F (Economizer off)			
Simulate MA-T above 55°F setpoint			
Simulate DA-T above 55°F setpoint			
Cooling coil valve opens to maintain 55° setpoint			
OA maximum damper remains closed			
Preheat valve remains closed			
Release MA-T simulation			
Release DA-T simulation			
Record the Min OA CFM setpoint			_____ CFM
Record the Min OA damper position			_____ % Open
Record the RA damper position			_____ Open
Record the actual minimum OA CFM			_____ CFM
Minimum OA is controlling at setpoint			
Increase the minimum CFM setpoint by 15%			
Minimum OA damper opens further			
Increase Minimum setpoint by 100%			
Minimum OA damper opens 100%			
RA damper begins closing			
Minimum OA/RA controls at the new setpoint			
Simulate OA-T to 54°F (Economizer on)			
OA maximum damper opens to temp setpoint			
Minimum OA damper remains open			
Return minimum OA flow setpoint to original			

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RA damper begins opening			
OA minimum damper begins closing			
Simulate a CO2 increase above setpoint			
OA minimum damper opens above flow setpoint			
Simulate a MALL temperature < 50° F			
OA minimum damper modulates closed			
AH Economizer/ Mech Clg Control	----	----	-----
Simulate OA-T to 51°F (Econ/Mech Clg on)			
Simulate MA-T above 55°F setpoint			
Max OA dampers open to maintain setpoint			
Preheat valve is closed			
Simulate further rise in MA-T to 100% OA max			
OA maximum dampers 100% open			
Simulate a rise in DA-T above setpoint			
Cooling coil valve opens to maintain 55°F DA-T			
Simulate a fall in DA-T below setpoint			
Cooling coil valve closes to maintain 55°F DA-T			
AH Economizer Only Control	----	----	-----
Simulate OA-T to 49°F (Economizer only)			
Simulate a rise in DA-T above setpoint			
OA maximum damper opens to 100%			
Simulate a rise in DA-T above setpoint			
Preheat valve is closed			
Cooling coil valve is closed (ctrl loop disabled)			
Simulate DA-T to 54°F (below setpoint)			
OA maximum dampers begin closing			
Simulate PH-T to 45°F			
Preheat modulates open to 50°F setpoint			
F/B damper modulates to bypass to 50°F			
Simulate an OA-T of 39.0°F			
Preheat valve opens to 100%			
F/B damper modulates to coil to 50°F setpoint			
Release PH-T simulation to auto			
Release MA-T simulation to auto			

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Release DA-T simulation to auto			
Clear any remaining overrides or simulations			
AH Humidity Control	----	----	-----
AH Occupied in Auto			
Simulate OA-T to 45°F			
Humidifier is enabled through DDC			
Humidifier operates self contained			
Simulate OA-T to 51°F			
Humidifier is disabled through DDC			
Simulate DA-H to 86%RH			
Humidifier valve closes			
Release DA-H simulation to auto			
Release OA-T simulation to auto			
AH Unoccupied Mode	----	----	-----
AH Occupied in Auto			
Simulate OA-T to 62°F (Econ/Mech Clg on)			
Simulate MA-T above 55°F setpoint			
Simulate DA-T above 55° setpoint			
Verify space temps >65 and <77			
Place AH in unoccupied mode			
SF stops			
OA Min/Max and EA dampers close			
RA damper opens			
Cooling valve closes			
Preheat valve closes			
Simulate a space temperature of 83°F			
AH SF restarts in unoccupied cooling mode			
OA Min/Max dampers remain closed			
Preheat valve remains closed			
Cooling coil valve opens to 55° setpoint			
Simulate a space temperature of 77°F			
AH SF stops in unoccupied mode			
Simulate a space temperature of 59°F			
AH SF restarts in unoccupied heating mode			

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Remarks Section at end of document.

