

## Functional Performance Test

**[Project Name]**

System: **Makeup Air**

Tag: **AHU-1**

Location: **Ventilation Air**

<i>Functional Performance Test</i>	<i>Pass</i>	<i>Fail</i>	<i>Remarks</i>
<b>FPT Test Prerequisites</b>			
SVC form completed and signed and dated		-----	
TAB completed		-----	
Point to Point checks completed	X	-----	
Point calibration completed	X	-----	
		-----	
<b>CMMS Data</b>			
Model #	X	-----	CSAA010UAG00
Serial #	X	-----	K13J80011
Unit Location	X	-----	Attic
Area Served	X	-----	All areas
<b>AHU External Layout</b>			
AHU Occupied/Running in Auto	X		
All penetrations sealed	X		
Door gaskets air tight (no air leaks)	X		
All sections accessible (no access doors blocked)	X		
Construction debris removed from area	X		
Control panel neat/clean and free of debris	X		
Unit is properly tagged (Plastic engrave label)		X	Remark 3
Cooling coil condensate drains properly	X		
Insulation complete and in good condition	X		
<b>Functional Verification</b>			
<b>AHU Normal DDC Shutdown</b>			
AH Occupied in Auto	X		
Verify space temps >65 and <77	X		
Stop Unit through DDC	X		
SF & EF stop	X		
Energy wheel stops	X		
OA damper closed		X	Remark 4
EA damper closed		X	Remark 5
Cooling valve closes	X		
Preheat valve closes	X		
Preheat pump off	X		
Wheel Bypass Damper to bypass		X	Remark 6
Lock out Supply fan & Exhaust fan at VFD	X		

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<b>AHU Internal Layout</b>			
OA dampers fully closed and undamaged		X	Remark 4
OA-T sensor installed prior to OA filters		X	Remark 7, 8
OA-RH sensor installed prior to OA filters		X	Remark 9
OA Filters are properly installed and clean	X		
Energy wheel undamaged	X		
OA Heat Wheel DA-T installed between energy wheel and preheat coil	X		
Low Limit capillaries installed properly prior to preheat coil		X	Remark 11
Preheat coil and fins are undamaged	X		
PreHeat pump supported		X	Remark 12
Cooling coil and fins are undamaged	X		
CC DAT-T is averaging type and located across outlet of cooling coil		X	Remark 13
Coils mounted, sealed, and tight	X		
Coil section dry during summer	X		
SA Fan section dry during summer	X		
SA Fan released on isolation springs	X		
SA Fan lubrication points accessible		X	Remark 14
SA-T sensor installed after SA Fan	X		
SA-RH sensor installed after SA Fan		X	Remark 15
EA-T sensor installed before heat wheel	X		
EA-RH sensor installed before heat wheel	X		
EA Filters are properly installed and clean		X	Remark 10
Face/Bypass Damper to bypass position		X	Remark 6
EA Heat Wheel DA-T installed between energy wheel and EA fan		X	Remark 16
EA Fan released on isolation springs	X		
EA Fan lubrication points accessible	X		
EA dampers are fully closed and undamaged		X	Remark 5
AH is clean inside and free of debris		X	Remark 17
AH Lights operational		X	Remark 18
<b>AHU Control Device Verification</b>			
Drive OA to open		X	Remark 4
OA dampers are fully open		X	Remark 4
Verify OA damper blade seals		X	Remark 4

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Drive EA damper to open		X	Remark 4
EA damper fully open		X	Remark 4
Verify EA damper seals		X	Remark 4
Drive Face/Bypass dampers to 25%, 50%, 75%, 100% Face		X	Remark 19
Face/Bypass dampers fully open to coil face		X	Remark 19
Verify Face/Bypass damper seals	X		
Drive Preheat valve to 100% open	X		
Drive Preheat valve to 75%, 50%, 25%, 0%		X	Remark 20
Leave Preheat valve 0% open	X		
Drive Cooling valve to 100% open	X		
Drive Cooling valve to 75%, 50%, 25%, 0%			Remark 20
Leave Cooling valve 0% open	X		
Verify Preheat pump rotation		X	Remark 22
Close and latch all access doors	X		
Return SF & EF VFD to auto	X		
Return energy wheel VFD to auto	X		
AHU remains in unoccupied mode to allow safety verification	X		
<b>Safety And Limit Verification</b>			
Simulate OA Damper endswitch Open		X	Remark 4
Start AH in auto occupied mode through DDC		X	Remark 4
OA & EA dampers open		X	Remark 4
OA & EA fans remain Off		X	Remark 4
OA damper switch alarm generated at workstation		X	Remark 4
OA & EA dampers close		X	Remark 4
Record CHW Valve status		X	Remark 4
Record HW Valve status		X	Remark 4
Record Face/Bypass Damper status		X	Remark 4
Remove OA Damper endswitch simulation		X	Remark 4
Reset alarm at workstation		X	Remark 4
Simulate EA Damper switch open		X	Remark 4
Start AH in auto occupied mode through DDC	X		
OA & EA dampers open		X	Remark 5

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Record BAS Values			
Allow unit to stabilize for temperature control	X	----	
Unit Enable Start /Stop	X	----	Auto
OA Damper Position	X	----	100 %Open
OA-CFM	X	----	3808 CFM
OA Filter Status	X	----	Clean
Energy Wheel command	X	----	On
Energy Wheel status	X	----	On
Heat Wheel Supply Air Discharge Temperature	X	----	82.5 °F
Preheat WH Coil Valve %	X	----	0 %Open
Preheat Pump Command	X	----	Off
Preheat Pump Status	X	----	Off
PreHeat Coil Discharge Temperature	X	----	78.4 °F
Low Limit FreezeStat Status	X	----	Normal
CHW Coil Valve %	X	----	47 %Open
SF VFD command	X	----	70% / 42 hz
SF VFD status	X	----	On
SA-T	X	----	64.9 °F
SA-T Setpoint	X	----	65 °F
EA-T prior to wheel	X	----	77.5 °F
EA-RH prior to wheel	X	----	60.7 % RH
EA Filter Status		----	Clean
Wheel Face/Bypass Damper Position		----	100 % Face
EF VFD command		----	On
EF VFD status		----	On
EA Damper Position		----	100 %Open
OA Enthalpy			Not displayed
OA Dewpoint		----	Not displayed

Number	Date	Remark
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1	6/11/14	Functional Performance Testing was conducted by Kim Kissick representing Facility Commissioning Group. James Randall represented ISS.
2	6/11/14	Order #: P5C339A/A
3	6/11/14	Unit has factory labels only
4	6/11/14	Duct access door not provided at damper.
5	6/11/14	Damper not located
6	6/11/14	Wheel bypass damper closed.
7	6/11/14	OA-T sensor installed after filters prior to energy wheel. Probe type.
8	6/11/14	OA-T not shown on graphic at AHU.
9	6/11/14	OA-RH sensor not located. OA-RH value not displayed on graphic at AHU.
10	6/11/14	Filler plate not installed on exhaust air filters
11	6/11/14	Low limit switch installed after preheat coil.
12	6/11/14	Preheat pump not supported
13	6/11/14	Sensor is probe type installed in SA duct.
14	6/11/14	Individual would be required to crawl into fan compartment to access grease fittings.
15	6/11/14	Sensor not located. Value not shown on graphics.
16	6/11/14	Sensor installed in duct after fan
17	6/11/14	Unit contains duct and construction debris
18	6/11/14	Not provided.
19	6/11/14	Damper actuator appears to operate as two position actuator.
20	6/11/14	The control response is not linear. It appears that the actuator requires a 2 – 10V signal. The analog output appears to be scaled 0 -10V.
21	6/12/14	Functional Performance Testing was continued 6/12/14 by Kim Kissick representing Facility Commissioning Group (FCG),
22	6/12/14	Pump turned Off at combination starter.
23	6/12/14	No scale on adjustment
24	6/12/14	Valves remain closed with override from control program. Valves are not hardwired to open on freezestat.
25	6/12/14	Valve opens to 50% when released to automatic control
26	6/12/14	Valve opens to 100% when released to automatic control
27	6/12/14	Wheel bypass damper remains closed with freezestat tripped.

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