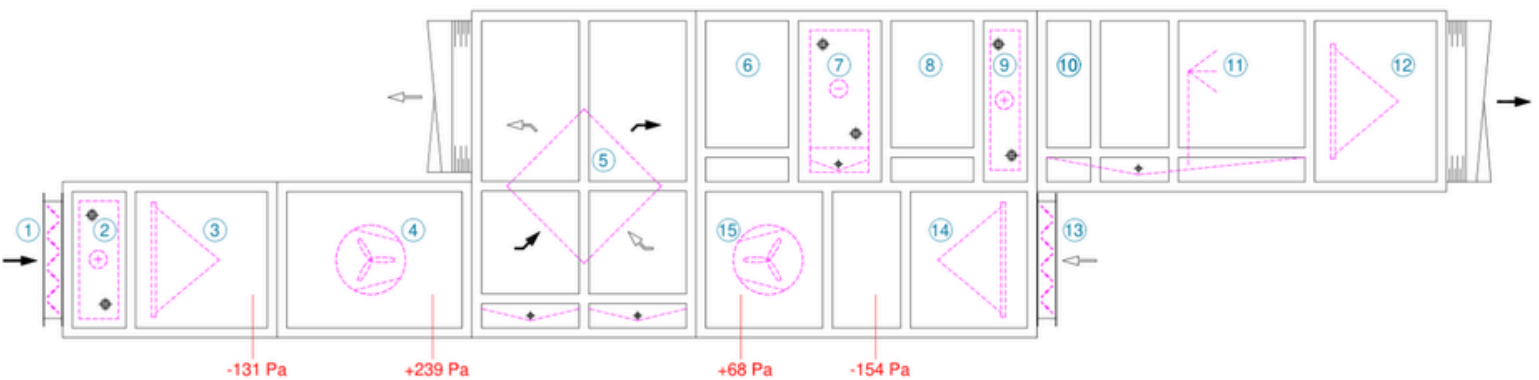


Example AHU Report

AHS Reference:

Surveyed By:

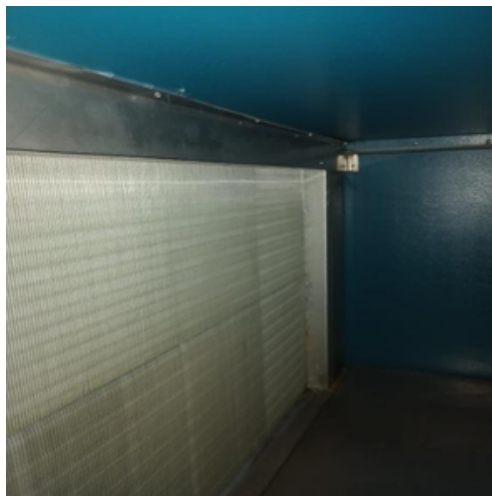
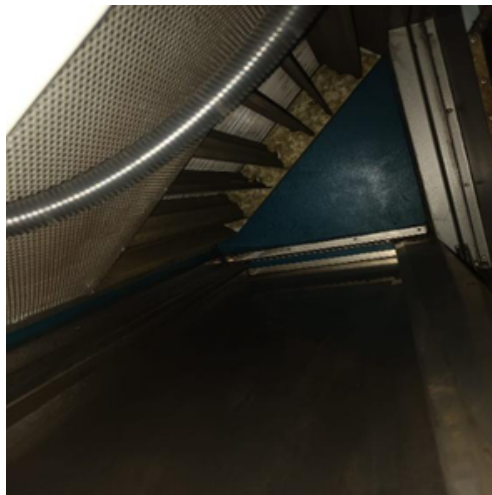
AHU layout

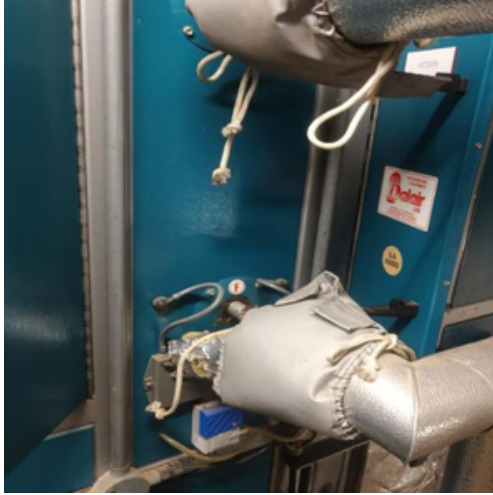


- 1) Fresh air intake damper (motorised)
- 2) Fog coil
- 3) Pre filters (bag)
- 4) Supply fan (motor out of airstream)
- 5) Plate heat exchanger
- 6) Access section
- 7) Chilled water coil
- 8) Access section
- 9) Main LPHW coil
- 10) Access section
- 11) Decommissioned humidifier
- 12) Secondary filters (bag)
- 13) Return air damper (motorised)
- 14) Extract filters (bag)
- 15) Extract fan

Photos









HTM-03 Compliance checklist

Hospital:		Hospital Name	
Plantroom:		Plantroom	
Air Handling Unit Ref:		AHU Reference	
Area Served by AHU:		Area Served	
Critical AHU Y/N		Critical (Y/N)	
AHU Age:		Approximate Age	
Date of Survey:		Date of Survey	
No	Survey Question	Comments	Y/N/NA
1	Plant Running?		Y
2	Is the unit and associated plant secure from unauthorised access?		Y
3	Is the unit safely accessible for inspection and maintenance?		Y
4	Is the air intake positioned to avoid short circuiting with extract of foul air from other sources?		Y
5	Are all inspection lights operating?	1 No. LOCATED IN DECOMMISSIONED HUMIDIFIER SECTION ONLY.NOT WORKING.	N
6	Are motorized dampers fitted to intake and discharge?	MOTORIZED DAMPER FITTED TO INTAKE & RETURN. NO DAMPER FITTED TO THE DISCHARGE	N
7	For belt driven fans is the drive visible without the need to remove covers?		Y
8	For plug/EC fans is the fan visible through the viewing port?		N/A
9	Is the cooling coil located on the discharge side of the fan?		Y
10	Is an energy recovery system fitted? (state type)	PLATE HEATEXCHANGER.	Y
11	Are condensate drains fitted to all energy recovery devices, cooling coils and humidifiers in accordance with HTM03 chapter 3 part B		Y
12	Are drainage traps clean and filled with water?		Y
13	Is the drain trap air break at least 15mm?		Y
14	If a humidifier fitted, state the type.		Y
15	Is the humidifier capable of operation?	HUMIDIFIER HAS BEEN REMOVED PREVIOUSLY.	N/A
16	Is there space to safely change the filters?		N/A
17	Are there test holes in the principal ducts?		Y
18	Are the test holes capped?		Y
19	What is the general condition of the exterior of the AHU?		Y
20	Are the principal ducts lagged?	EXTERNALLY SOUND WITH NO CORROSION VISIBLE	
21	What is the general condition of the associated control valves and pipework?		Y
22	Is the pipework adequately lagged?	GENERALLY OK	
23	Is the system clearly labelled?		Y
24	Record prefilter differential pressure	10mm LETTERING TRAFFOLYTE ONLY	N
25	Record main filter differential pressure	78 Pa	
		35 Pa	

26	Did all motorized dampers close on shut down?		Y
27	Is the Vermin/insect screen clean?	INTAKE HAS G3 FILTER MEDIA ROLL FITTED. THIS IS HEAVILY SOILED.	N
28	Is the intake section including fog coil clean?	CORROSION PRESENT IN FOG COIL & PRE FILTER SECTIONS.	N
29	Are the pre-filters correctly fitted with no air bypass?	SLIDE IN TYPE. BYPASS POSSIBLE DUE TO NO SIDE HOLDING ANGLE.	N
30	Are the drive belts correctly aligned and tensioned?		Y
31	Is the cooling coil matrix clean?		Y
32	Are all drip trays fully accessible or capable of being removed for cleaning and have a fall to drain?		Y
33	Are the drainage trays stainless steel?		Y
34	Are the drainage trays clean?		Y
35	Is the internal base of the AHU free from any signs of ponding?		Y
36	Are the heating matrices clean for each heater battery?	FOG COIL APPEARS TO BE IN POOR CONDITION.	N
37	Have the main filters been correctly fitted with no air bypass?	SLIDE IN TYPE. BYPASS POSSIBLE DUE TO NO SIDE HOLDING ANGLE.	N
38	Is AHU and its associated main ductwork clean internally?	INTERNAL CLEAN OF ALL ACCESSIBLE DUCTS REQUIRED.	N
39	Did the unit restart correctly?		Y
40	If present, does automatic changeover operate satisfactorily?		Y

Additional Information

- NO INTERNAL BULKHEAD LIGHTS OR PORTHOLES FOR EXTERNAL VIEWING IN FAN, ACCESS & FILTER SECTIONS.
- SHARED INTAKE PLENUM WITH HEAVILY SOILED G3 MEDIA FILTER FITTED TO DUCT INLET.
- NOTICABLE CORROSION FOUND IN THE INTAKE SECTIONS OF THE AHU (SEE PHOTOS ABOVE).
- INCLINE FLUID MANOMETERS FITTED TO FILTER SECTIONS.

Traffic light delap survey notes

Fresh air intake louvre	High level louvre serving 4 No. AHU's via shared brickwork plenum. Assume clean required.	<u>Amber</u>
Fresh air ductwork	Lack of hatches in ductwork. Clean required.	<u>Amber</u>
Fresh air intake damper & actuator	Could not view damper blades due to lack of access. Unit in average condition.	<u>Amber</u>
Casework	OK.	<u>Amber</u>
Channel base	Good for age. Door seals would benefit from replacement.	<u>Green</u>
Lifecycle casework	Standard GSS frame in poor condition. Would replace it with new. Corrosion on	<u>Amber</u>
Fog coil	floor. Requires plating. Slide in type. Air bypass possible. No viewing access to air on of filters. Access door	<u>Red</u>
Pre filters	has no bulkhead light or viewing port. Corrosion on floor. Requires plating. Corrosion on floor. Requires plating.	<u>Red</u>
Supply fan section	Corrosion in the fan scroll. Consideration for upgrade to direct drive EC fans to	<u>Red</u>
Supply fan (Scroll type belt driven fan)	reduce energy and also lessen maintenance required. The ventilation will need to be balanced to suit by validation specialist if upgrade take place.	<u>Red</u>
MOAS Supply motor	Consideration for upgrade to direct drive	<u>Red</u>
Pulleys & belts	Good access. Assume regular changing of belts as part of PPM. Not required if upgrade to direct drive EC fans.	<u>Amber</u>
Drive guard	OK.	<u>Green</u>
AV's	Ok, would be replaced if new layout installed.	<u>Green</u>
Plate heat exchanger	Ok condition for age of unit. Face & bypass damper actuator casing damaged. Replacement required.	<u>Green</u>
Access section	Good access to air on of chilled water coil. No internal light or porthole for external viewing.	<u>Red</u>
Chilled water cooling coil	Stainless Steel casing (no eliminators fitted). There is good access to the air on and air off sides of the coil. Assume coil has been meeting requirements.	<u>Red</u>
Access section	Good access to air off of chilled water coil and air on of main LPHW coil. No internal light or porthole for external viewing.	<u>Green</u>
LPHW coil	There is good access to the air on and off sides of the coil. Copper tubes, standard alu fins. Assume coil has been meeting requirements.	<u>Red</u>
Access section	Good access to air off side of LPHW coil and air the now vacant humidifier section. No internal light or porthole for external viewing.	<u>Amber</u>
Secondary filters	Good access. Access door has no bulkhead light or viewing port. Slide in type. Could benefit from changing to front withdrawal as this is the last line of visible filtration in the system. Also recommend changing to rigid filters.	<u>Red</u>
Supply air ductwork	No hatches or discharge motorized damper fitted.	<u>Red</u>
Return air intake damper & actuator	Could not view damper blades due to lack of access.	<u>Red</u>
Return filters	Slide in type. Air bypass possible. No viewing access to air on of filters. Access door has no bulkhead light or viewing port.	<u>Amber</u>
Extract fan section	Good condition.	<u>Red</u>
Extract fan (Scroll type belt driven fan)	Fan ok condition. Consideration for upgrade to direct drive EC fans to reduce energy and also lessen maintenance required. The ventilation will need to be balanced to suit by validation specialist if upgrade take place.	<u>Green</u>
Extract motor	Consideration for upgrade to direct drive	<u>Amber</u>
AV's	Ok, would be replaced if new layout installed.	<u>Amber</u>
Drain trays & traps	Removable drain trays fitted. All traps are glass & filled correctly.	<u>Green</u>
		<u>Green</u>

Airflow calculations

A duct traverse was able to be taken in the supply duct within the plantroom.

Calculations as follows:

Duct size: 500mm x 500mm

Number of readings taken: 20

Average velocity readings: 3.1m/s

Test volume: 0.775m³/s @ 370Pa (total static)

According to previous validation reports, the Theatre, Anaesthetic & SPS Prep rooms should have a total of **1.19m³/s** of supply air from the AHU.

** The AHU was also known to be supplying 0.171m³/s of air into the corridor.

Applying the fan square law, we would require the supply to be able to achieve **1.19m³/s @ 872Pa (total static)**

A duct traverse was unable to be taken in the extract duct as test holes could not be found during my survey.

A total static pressure of **222Pa** was recorded across the AHU extract fan chamber.

A manual fan curve was calculated, based on the fan, motor, pulley sizes and inverter speed. The airflow result came out at approx **0.82m³/s @ 222Pa (total static)**. I would suggest the new extract rate is increased inline with the supply.

** As a rule, corridors should have an extract rate of 7ACH, and maintain a negative pressure regime from the Theatre, Anaesthetic & Prep rooms. No room size was provided to calculate the necessary ACH for the corridor in the previous validation report.

Conclusion

The current unit layout does not meet HTM guidance as highlighted in the report.

The unit, however, is suitable for complete refurbishment with the option of reconfiguring internal components to better suit HTM-03 compliance.

Therefore, we would recommend replacing the components highlighted like for like in terms of design, but improved such as direct drive fans, stainless steel framed coils, new access panels with portholes, LED lighting.

Please note, access to the AHU is via a vertical fixed ladder within the plantroom. The AHU sits on a mezzanine deck with suitable handrails. A safe access to work including handling of parts up and down will need to be implemented prior to any works.

Report compiled by:

Technical Manager

AHS (Specialist Services) Ltd