



Air-Handling Unit Visual Inspections

This month we are going to discuss air-handling units (AHU) beginning with the diversity of these heating, ventilating, and air-conditioning units. AHU's can be found in one's home and may be referred to as warm air furnaces for heating although these furnaces may also have a cooling coil for air-conditioning too.

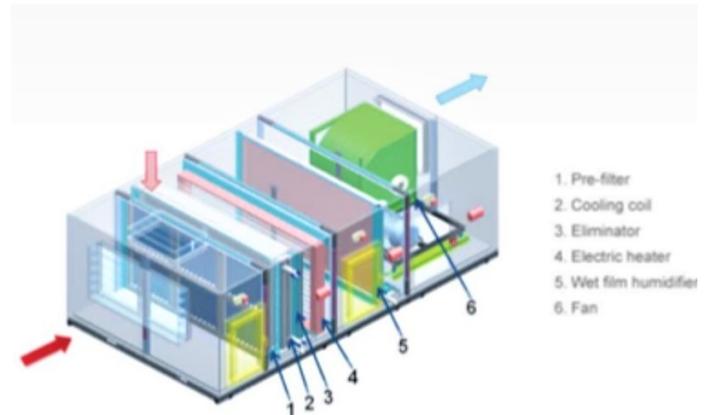
Air-handling units in commercial, industrial, or institutional buildings may be inside the building, adjacent to the building, or on the roof of the building. These units have a few different names beginning with AHU followed by central AHU, rooftop AHU, etc. all designating the equipment supplies conditioned air, returns, room air, and/or exhausts building air.

Any one of these various AHU's may provide heat via fossil fuel, electricity, steam, or hot water with this heating equipment located inside the AHU. This same unit may also provide air-conditioning via direct expansion refrigerant or chilled water with this equipment also within the AHU.

Seldom are the larger AHU's located in a space where the occupants can see this equipment because this equipment is probably located in a fan room or equipment room out of sight and out of mind for most in the building. There are smaller, individual AHU's often located within the room.

All of these AHU's require routine visual inspection as well as routine maintenance to keep these units providing the heating, ventilating, and/or air-conditioning that they were designed to provide space comfort. Whether it's your own AHU at home or the facility maintenance person's responsibility to operate and maintain this equipment it needs to be done.

To provide a visual inspection one can simply look at the unit whether it be in an open space or in an equipment room.



Things to look for are:

- Signs of water and/or air-conditioning condensate leaking from the unit enclosure.
- Brushing one's hand across the unit cabinet feel for air drafts indicating air leakage.
- Listen for unusual noise excluding the fan although, if the fan is exceptionally noisy the fan shaft may be out of alignment.
- If the fan is noisy it may also be creating a vibration.
- The inlet/return air grille may have a fair amount of dust collecting on the individual grille blades

After the visual inspection and if there exists concerns from the above list then the home owner or the facility person should be notified so corrective measures can be made.

A facility person will be providing visual inspections along the lines of those tasks noted above but this person will also be responsible for completing a visual inside the AHU. Before starting an inspection inside an AHU the individual should make sure the power to this AHU is shut-off. A common method to secure the unit is to have a key-operated lock that is placed on the motor

starter disconnect handle so that no one can accidentally turn the electrical power on while someone is working on the AHU.

Once the electrical power is secured the person doing the inspection should make sure he or she is wearing safety glasses, as well as protective gloves for sharp metal edges within the unit. With the necessary personal protection equipment in place and the bag of needed tools to complete the inspection the following steps can be taken:

- Visual inspection of outside the unit as noted above including the sheet metal distribution for air leaks.
- Visual inspection of the unit inside looking at the interior unit enclosure insulation for damage and missing lining on the inside of unit enclosure panels.
- Visual inspection of each module within the AHU enclosure including the fan cabinet, heating, cooling, plenum, and filter modules for damaged panel lining/insulation.
- Visual inspection of the interior of the AHU for wetted area where mold and bacteria can form, as well as rust leading to corrosion.
- Water leaks can occur from pipe fittings that are not tight or have come loose from the AHU vibration.
- Listening for unusual sounds should be done when the unit exterior panel(s) is removed.
- Unusual noise and excessive vibration can occur over time and should be part of the visual inspection.
- Fan section should be inspected to determine if the multiple belts are on and to determine if the belts are sufficiently tight.
- Heating coil section should be inspected to determine if any part of the coil surface has been damaged.
- Cooling coil section inspection is similar plus the coil's drain pan should be checked for tightness and to make sure water isn't collecting in this pan.
- Automatic control valves should receive a visual inspection to make sure the control operator is securely in place.
- Going beyond a visual inspection of an in-line pipe strainer upstream of the heating and/or cooling coil will require a more in depth inspection of the pipe requiring the strainer to be removed for visual inspection

- Filter casing should be checked to determine whether the filters are dirty. Often, when the filters are not changed on a regular basis the filters can get over loaded with dust particles and the filter can collapse allowing unfiltered air to pass on by the damaged filter and begin to have the dust particles collect and build up on the first coil in line after the filter section.
- Often there are manual or automatic dampers within an AHU and they should be inspected to make sure they have not rusted in place and not operating as intended.
- Automatic control damper operators should be checked for tightness on the damper leakage to make sure the damper(s) and associated leakage is all in place and connected.
- If possible the individual should visually inspect the discharge air ductwork through a sheet metal access panel to make sure the ductwork is clean and devoid of metal particles laying on the inside of the ductwork.
- Return air ductwork should also be reviewed because this sheet metal system will often draw dust and lint in onto the interior duct surface.

Completing a visual inspection of an AHU both outside and inside will often lead to a more detailed inspection and repair task but these inspections are essential to aiding in the AHU operating efficiently, as well as looking well maintained.

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