# AHU Parts List and Functions

Air handling unit components, what each part does, and what to check

| Part | Function | Check / spare notes |
|---|---|---|
| **HOUSING** | | |
| **1. Casing / cabinet (double-skin panels)** | Encloses every section, keeps conditioned air in and outside air, dust and moisture out. Double-skin panels with PUF or rockwool insulation stop heat gain and condensation on the outer skin. | Panel gaskets, door seals, corrosion, air leakage |
| **2. Frame / profile (aluminium, with thermal break)** | Structural skeleton that holds the panels. A thermal-break profile prevents cold bridging and sweating on the outside of the unit. | Loose joints, sweating on the outer frame |
| **3. Base frame / skid** | Steel channel base that supports the AHU, spreads its weight and allows lifting and levelling. | Rust, levelling, anchor bolts |
| **MIXING** | | |
| **4. Fresh air (outdoor air) damper** | Admits outdoor air for ventilation. Its opening sets how much fresh air the building gets. | Blade linkage, actuator, seals |
| **5. Return air damper** | Controls how much room air is recirculated back into the unit. | Linkage, actuator calibration |
| **6. Exhaust / relief air damper** | Lets excess air out of the building so fresh air can come in without over-pressurising the space. | Linkage, blade seals |
| **7. Mixing box / plenum** | Chamber where fresh air and return air blend before filtration and conditioning. | Cleanliness, stratification |
| **8. Damper actuator** | Motor that opens and closes dampers on command from the controller or BMS. | Stroke, signal (0–10 V / 4–20 mA), end-switch |
| **FILTRATION** | | |
| **9. Pre-filter (primary filter)** | First filter stage. Captures coarse dust, lint and insects to protect the coil and fine filters. Usually G4 (EN 779), MERV 8 or ISO Coarse / ePM10 class. | Differential pressure; clean or replace frequently |
| **10. Fine filter (secondary / bag filter)** | Removes fine particles such as pollen and smoke. Usually F7–F9 (EN 779), MERV 13–15 or ISO ePM1 class, often as bag or rigid box filters. | Differential pressure against final resistance |
| **11. HEPA filter (terminal or in-unit)** | High-efficiency particulate filter, typically H13 or H14 (EN 1822), used for cleanrooms, operation theatres and pharma areas. | Integrity (leak) test, differential pressure |
| **12. Filter frame and holding clips** | Holds filters in place and seals them so air cannot bypass the media. | Bypass leaks, missing clips, gasket damage |
| **13. Differential pressure gauge (e.g. Magnehelic)** | Shows the pressure drop across a filter so you know when it is loaded and needs replacing. | Tubing, zero setting |
| **THERMAL** | | |
| **14. Cooling coil (chilled water or DX)** | Copper tubes with aluminium fins that cool and dehumidify air. Chilled-water coils connect to a chiller; DX coils carry refrigerant from a condensing unit. | Fin fouling, leaks, face velocity, water treatment |
| **15. Heating coil (hot water, steam or electric)** | Heats air in winter, or reheats over-cooled air to control humidity in precision applications. | Leaks, electric heater elements, safety thermostat |
| **16. Drain pan (condensate tray)** | Collects water condensed on the cooling coil. Usually stainless steel, sloped to drain so water does not stagnate. | Slope, blockage, corrosion, trap |
| **17. Condensate drain and trap** | Carries condensate away. The trap stops air being sucked in or blown out through the drain line. | Trap water seal, blockage |
| **18. Moisture eliminator** | Blades downstream of the coil that catch water droplets so they are not carried into the ductwork. | Blade condition, carryover |
| **19. Humidifier (steam, pad or spray)** | Adds moisture when air is too dry, important in hospitals, pharma, textiles and data centres. | Scale, cylinder or nozzle, water quality |

## AHU Parts List and Functions (continued)

| Part | Function | Check / spare notes |
|---|---|---|
| **ENERGY RECOVERY** | | |
| **20. Heat recovery device (wheel, plate or heat pipe)** | Transfers heat (and, with a wheel, moisture) between exhaust and fresh air to cut cooling and heating energy. | Wheel seals and drive belt, plate fouling |
| **AIR MOVEMENT** | | |
| **21. Fan / blower (centrifugal or plug fan)** | The heart of the AHU. It creates airflow and the static pressure needed to push air through filters, coils and ducts. | Vibration, noise, impeller balance, airflow |
| **22. Fan motor** | Drives the fan. Modern units use IE3 or IE4 efficiency motors or EC motors. | Current draw, insulation, bearings, temperature |
| **23. Drive (belt and pulley, or direct drive)** | Transfers power from motor to fan. Belt drives allow speed changes via pulleys; direct and EC drives remove belt losses. | Belt tension, wear, pulley alignment |
| **24. Variable frequency drive (VFD)** | Varies motor speed to match airflow demand, saving energy and allowing soft start. | Parameters, cooling fan, fault logs |
| **25. Vibration isolators (spring or rubber mounts)** | Stop fan and motor vibration from travelling into the casing and building structure. | Spring deflection, rubber cracking |
| **26. Flexible connection (canvas connector)** | Flexible joint between the fan outlet or AHU and the duct to isolate vibration. | Tears, air leaks |
| **27. Sound attenuator (silencer)** | Absorbs fan noise before it travels down the duct to occupied spaces. | Media damage, cleanliness |
| **ACCESSORIES** | | |
| **28. UV-C lamp (UVGI)** | Ultraviolet lamps that reduce microbial growth on coils and drain pans. | Lamp hours, intensity, safety interlock |
| **29. Access doors, viewing ports and inspection lights** | Allow safe inspection and maintenance of each section without dismantling panels. | Hinges, latches, door seals |
| **CONTROLS** | | |
| **30. Sensors (temperature, humidity, pressure, CO2)** | Measure supply, return and room conditions so the controller can modulate valves, dampers and fan speed. | Calibration, wiring |
| **31. Control valve and actuator (2-way or 3-way)** | Modulates chilled or hot water flow through the coil to hold the set temperature. | Actuator stroke, passing valve |
| **32. Control panel / DDC controller / BMS interface** | Starts and stops the unit, runs the control logic, provides safeties and links the AHU to the building management system. | Alarms, interlocks, communication |
| **SAFETY** | | |
| **33. Fire damper and smoke detector** | Close off the duct and shut down the AHU in a fire so smoke does not spread through the building. | Fusible link, periodic drop test, detector test |