# Air Handling Unit Construction Checklist

 (rev. 12/1/2015)

|  |  |  |  |
| --- | --- | --- | --- |
| Project |  | **Date** |  |
| Tag |  | Location |  | Service Area |  |

## Submittal

The above equipment and systems integral to them are complete and ready for functional testing. The checklist items are complete and have been checked off only by parties having direct knowledge of the event.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Mechanical Contractor | Date | Controls Contractor | Date |
|  |  |  |  |
| Electrical Contractor | Date | Sheet Metal Contractor | Date |
|  |  |  |  |
| TAB Contractor | Date | General Contractor | Date |

Construction checklist items are to be completed as part of startup and initial checkout, before functional testing.

* This checklist augments, but is not meant to replace recommendations or requirements for installation, checkout and startup from standards, manufacturers, codes or governing bodies.
* If this form is not used for documenting, a CxP approved form of similar rigor may be used.
* Contractors assigned responsibility for sections of the checklist shall be responsible to see that checklist items by their subcontractors are completed and checked off.
* In the Trade column, indicate the contractor responsible for verifying the completion of this item:
A/E = architect/engineer All = all contractors CxP = commissioning provider
CC = controls EC = electrical GC = general
MC = mechanical PC = plumbing SC = sheet metal
TAB = test and balance

## Approval

This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted below.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Commissioning provider | Date | Owner’s Representative | Date |

## AHU Information Trade:[\_\_\_\_\_]

|  |  |  |  |
| --- | --- | --- | --- |
| Make |  | Model |  |
| Serial Number |  | Volts/Phase |  |
| Capacity (cfm) |  | l |  |
| Label |  | Label |  |
| Comments |

## Components Included

|  |  |  |  |
| --- | --- | --- | --- |
| [ ]  Supply Fan | [ ]  VFD(s) | [ ]  Filter(s) | [ ]  Pre-heat Coils |
| [ ]  Return Fan | [ ]  Economizer | [ ]  Humidifier | [ ]  Heating Coil |
| [ ]  Exhaust/Relief Fan | [ ]  Air Blender | [ ]  Cooling Coil | [ ]  Other |

## Requested Documentation

Mark checkbox if the document was received. If not, indicate the number of an applicable explanatory note.

|  |  |  |
| --- | --- | --- |
| Requested Documentation Submitted | Rec’d | Note # |
| Factory test results (if applicable) | [ ]  |  |
| Installation and startup booklet provided to CxP | [ ]  |  |
|  Startup report | [ ]  |  |
| Comments: |  |  |

## Installation Checks

If acceptable, mark the check box. If unacceptable, indicate the number of the applicable explanatory note attached to this form.

|  | Trade | OK? | Note # |
| --- | --- | --- | --- |
| General |  |  |  |
| Cabinet and general installation |  | [ ]  |  |
| Permanent labels affixed, including for fans |  | [ ]  |  |
| Casing condition good: no dents, leaks, door gaskets installed |  | [ ]  |  |
| Access doors close tightly - no leaks |  | [ ]  |  |
| Connection between duct and unit tight and in good condition |  | [ ]  |  |
| Vibration isolation equipment installed & released from shipping locks |  | [ ]  |  |
| Maintenance access acceptable for unit and components |  | [ ]  |  |
| Sound attenuation installed |  | [ ]  |  |
| Thermal insulation properly installed and according to specification |  | [ ]  |  |
| Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.) |  | [ ]  |  |
| Clean up of equipment completed per contract documents |  | [ ]  |  |
| Filters installed and replacement type and efficiency permanently affixed to housing--construction filters removed |  |  [ ]  |  |
| Seismic restraints in place |  | [ ]  |  |
| Boot between unit and duct is tight and in good condition |  | [ ]  |  |
| **Valves, Piping and Coils** |
| Pipe fittings complete and pipes properly supported |  | [ ]  |  |
| Pipes properly labeled |  | [ ]  |  |
| Pipes properly insulated |  | [ ]  |  |
| Strainers in place and clean, blowdown installed |  | [ ]  |  |
| Piping system properly flushed |  | [ ]  |  |
| No leaking apparent around fittings |  | [ ]  |  |
| All coils are clean and fins are in good condition |  | [ ]  |  |
| All condensate drain pans clean and slope to drain, per spec |  | [ ]  |  |
| Valves properly labeled |  | [ ]  |  |
| Valves installed in proper direction |  | [ ]  |  |
| Temperature and pressure gages properly located and secure  |  | [ ]  |  |
| Test plugs (P/T) and isolation valves installed per drawings |  | [ ]  |  |
| Fans and Dampers  |  |  |  |
| Supply fan and motor alignment correct |  | [ ]  |  |
| Supply fan belt tension and condition good |  | [ ]  |  |
| Supply fan protective shrouds for belts in place and secure |  | [ ]  |  |
| Supply fan area clean |  | [ ]  |  |
| Supply fan and motor properly lubricated |  | [ ]  |  |
| Return/exhaust fan and motor aligned |  | [ ]  |  |
| Return/exhaust fan belt tension & condition good |  | [ ]  |  |
| Return/exhaust fan protective shrouds for belts in place and secure |  | [ ]  |  |
| Return/exhaust fan area clean |  | [ ]  |  |
| Return/exhaust fan and motor lube lines installed and lubed |  | [ ]  |  |
| Filters clean and tight fitting |  | [ ]  |  |
| Filter pressure differential measuring device installed and functional (magnehelic, inclined manometer, etc.) |  | [ ]  |  |
| Smoke and fire dampers installed properly per contract docs (proper location, access doors, appropriate ratings verified) |  | [ ]  |  |
| All dampers close tightly |  | [ ]  |  |
| All damper actuators installed |  | [ ]  |  |
| Ducts |  |  |  |
| Sound attenuators installed |  | [ ]  |  |
| Duct joint sealant properly installed |  | [ ]  |  |
| No apparent severe duct restrictions |  | [ ]  |  |
| Turning vanes in square elbows as per drawings |  | [ ]  |  |
| OSA intakes located away from pollutant sources & exhaust outlets |  | [ ]  |  |
| Pressure leakage tests completed |  | [ ]  |  |
| Branch duct control dampers operable |  | [ ]  |  |
| Ducts cleaned as per specifications |  | [ ]  |  |
| Balancing dampers installed as per drawings and TAB’s site visit |  | [ ]  |  |
| Electrical |  |  |  |
| Power disconnects located within site of the unit it controls and labeled |  | [ ]  |  |
| All electric connections tight |  | [ ]  |  |
| Grounding installed for components and unit |  | [ ]  |  |
| Safeties installed and operational |  | [ ]  |  |
| Starter overload breakers installed and correct size |  | [ ]  |  |
| **Controls** |
| Control panel(s) and feeds (local disconnects) energized. |  | [ ]  |  |
| Control wiring & control system terminated (flow switch(es), temp/flow/dP sensors, comm., damper actuators, makeup water meter, etc.) & energized. |  | [ ]  |  |
| Control system interlocks & safety circuits (smoke detector or FACP, high duct static, freeze stat) terminated & tested. |  | [ ]  |  |
| All control feedback devices are installed where a reliable reading will be provided (temperature, pressure, flow). |  | [ ]  |  |
| All control devices are now reading and ready for calibration check, below. |  | [ ]  |  |
| Duct static pressure sensor properly located and per drawings & calibrated (> 70% down from fan to critical TU & >5 duct dia’s upstream and > 10 duct dia’s downstream from takeoffs, etc.). |  | [ ]  |  |
| Duct static pressure sensor location marked on as-built drawings |  | [ ]  |  |
| Low limit freeze stat sensor located to deal with stratification & bypass. |  | [ ]  |  |
| Hardwired interlocks to fire alarm system to shut down unit installed. |  | [ ]  |  |
| Duct smoke detectors in place. |  | [ ]  |  |
| Control wiring in conduit as required per plans/spec. |  | [ ]  |  |
| All serial comm. cable is shielded-twisted pair. |  | [ ]  |  |
| Serial comm. terminating resistors installed as required.  |  | [ ]  |  |
| Grounding: all cabinets & circuits per code & mfr instruction. |  | [ ]  |  |
| BAS Point-to-point checks have been completed, documented, & attached, including VFD speed reference, sensor & actuator calibrations (see calibration section below). |  | [ ]  |  |
| All damper & valve actuators operate full stroke, close tight, without binding. |  | [ ]  |  |
| Wiring schematics attached to each control panel, per spec. |  | [ ]  |  |
| Flow station(s) area factor(s) confirmed to be correct on supply and return fans. |  | [ ]  |  |
| Flow station(s) readings checked against balancer readings and correction factor(s) installed, if warranted. Document this: |  | [ ]  |  |
|  **VFD** |
| VFD checks are listed in another checklist. | n/a | n/a | n/a |
| **Sensors and Gages** |
| Temperature, pressure and flow gages and sensors installed |  |  [ ]  |  |
| Piping gages, BAS and associated panel temperature and pressure readouts match.  |  |  [ ]  |  |
| **TAB** |
| Installation of system and balancing devices allowed balancing to be completed following specified NEBB or AABC procedures and contract documents |  | [ ]  |  |
| Smoke and fire dampers and all terminal units are open |  | [ ]  |  |
| Flow station accuracy checked against duct traverse, velgrid on coil or filter bank. |  | [ ]  |  |

## Operational Checks

If acceptable, mark the check box. If unacceptable, indicate the number of the applicable explanatory note attached to this form.

| Check | Trade | OK? | Note # |
| --- | --- | --- | --- |
| Supply fan rotation correct (If VFD, check rotation in bypass and VFD Inverter mode) |  | [ ]  |  |
| Return/exhaust fan rotation correct |  | [ ]  |  |
| Return /exhaust fan acceptable noise & vibration |  | [ ]  |  |
| Supply fan has no unusual noise or vibration |  | [ ]  |  |
| Actuator spanned, modulate smoothly and proportional to input signal and EMS readout |  | [ ]  |  |
| All dampers (OSA, RA, EA, etc.) stroke fully without binding and spans calibrated and BAS reading site-verified |  | [ ]  |  |
| Valves stroke fully and easily and spanning is calibrated  |  | [ ]  |  |
| Valves verified to not be leaking through coils when closed at normal operating pressure |  | [ ]  |  |
| Specified point-to-point checks have been completed and documentation record submitted for this system |  | [ ]  |  |
| Restoration of power won’t over-pressurize duct from closed FSD’s. |  | [ ]  |  |
| The HOA switch properly activates and deactivates the unit. |  |  |  |
| Test that supply or return fan will not start up in hand or bypass until dampers up and downstream are open so that duct and damper damage don’t occur. |  |  |  |
| Smoke detector tested to shut down supply and return fans from fire alarm panel (hard wired). |  | [ ]  |  |

## Sensor and Actuator Calibration

All field-installed sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated in accordance with Specification Section [\_\_\_\_\_\_\_\_\_\_\_\_\_]

All test instruments shall have had a certified calibration within the last 12 months? 🞎Y/N🞎

Sensors installed in the unit at the factory with calibration certification provided with no additional wire being added to the controller need not be field calibrated.

NOTE: This form need not be filled in if the information is in the control contractor’s checkout forms.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sensor or Actuator Tag & Location | Location OK? | First Gage or BAS Value | Instrument-Measured Value | Final Gage or BAS Value | Pass? |
|  | 🞎Y/N🞎 |  |  |  | 🞎Y/N🞎 |
|  | 🞎Y/N🞎 |  |  |  | 🞎Y/N🞎 |
|  | 🞎Y/N🞎 |  |  |  | 🞎Y/N🞎 |
|  | 🞎Y/N🞎 |  |  |  | 🞎Y/N🞎 |
|  | 🞎Y/N🞎 |  |  |  | 🞎Y/N🞎 |
|  | 🞎Y/N🞎 |  |  |  | 🞎Y/N🞎 |

|  |
| --- |
| General Comments: |

End of Checklist