

Air Conditioning Construction Checklist

Project:	
Date:	
Tag:	
Building:	
Location:	

Submittal / Approvals

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, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed.____ **List attached.**

Mechanical Contractor	Date	Controls Contractor	Date
Electrical Contractor	Date	Refrigeration Contractor	Date
TAB Contractor	Date	General Contractor	Date

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

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- If this form is not used for documenting, one of similar rigor shall 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.

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

Commissioning Authority	Date	Owner's Representative	Date

AHU Information					
Make			Model Number		
Serial Number			Capacity	CFM	
Volts/Phase		Function		Service Area	
Comments:					

Components Included					
Supply Fan	<input type="checkbox"/>		<input type="checkbox"/>	Cooling Coil	<input type="checkbox"/>
Return Fan	<input type="checkbox"/>		<input type="checkbox"/>	Heating Coil	<input type="checkbox"/>
Filter(s)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Humidifier	<input type="checkbox"/>		<input type="checkbox"/>	Other	<input type="checkbox"/>
Associated Checklists					
Condenser	<input type="checkbox"/>	Condensate Piping	<input type="checkbox"/>		<input type="checkbox"/>
Refrigerant Piping	<input type="checkbox"/>			Other	<input type="checkbox"/>
Controls	<input type="checkbox"/>			Other	<input type="checkbox"/>
Comments:					

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Performance data (fan curves, coil data, etc.)	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Installation Checks		
Check if acceptable, provide comment if unacceptable	NA	Comment

Installation Checks			
Check if acceptable, provide comment if unacceptable	NA	Comment	
General			
Cabinet and general installation	<input type="checkbox"/>	<input type="checkbox"/>	
Permanent labels affixed, including for fans	<input type="checkbox"/>	<input type="checkbox"/>	
Casing condition good: no dents, leaks, door gaskets installed	<input type="checkbox"/>	<input type="checkbox"/>	
Access doors close tightly - no leaks	<input type="checkbox"/>	<input type="checkbox"/>	
Connection between duct and unit tight and in good condition	<input type="checkbox"/>	<input type="checkbox"/>	
Vibration isolation equipment installed & released from shipping locks	<input type="checkbox"/>	<input type="checkbox"/>	
Maintenance access acceptable for unit and components	<input type="checkbox"/>	<input type="checkbox"/>	
Sound attenuation installed	<input type="checkbox"/>	<input type="checkbox"/>	
Thermal insulation properly installed and according to specification	<input type="checkbox"/>	<input type="checkbox"/>	
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	
Clean up of equipment completed per contract documents	<input type="checkbox"/>	<input type="checkbox"/>	
Filters installed and replacement type and efficiency permanently affixed to housing-- construction filters removed	<input type="checkbox"/>	<input type="checkbox"/>	
Valves, Piping and Coils			
Pipe fittings complete and pipes properly supported	<input type="checkbox"/>	<input type="checkbox"/>	
Pipes properly labeled	<input type="checkbox"/>	<input type="checkbox"/>	
Pipes properly insulated	<input type="checkbox"/>	<input type="checkbox"/>	
Strainers in place and clean, blowdown installed	<input type="checkbox"/>	<input type="checkbox"/>	
Piping system properly flushed	<input type="checkbox"/>	<input type="checkbox"/>	
No leaking apparent around fittings	<input type="checkbox"/>	<input type="checkbox"/>	
All coils are clean and fins are in good condition	<input type="checkbox"/>	<input type="checkbox"/>	
All condensate drain pans clean and slope to drain, per spec	<input type="checkbox"/>	<input type="checkbox"/>	
Valves properly labeled	<input type="checkbox"/>	<input type="checkbox"/>	
Valves installed in proper direction	<input type="checkbox"/>	<input type="checkbox"/>	
OSAT, MAT, SAT, RAT, chilled water supply sensors properly located and secure (related OSAT sensor shielded)	<input type="checkbox"/>	<input type="checkbox"/>	
Test plugs (P/T) and isolation valves installed per drawings	<input type="checkbox"/>	<input type="checkbox"/>	
Fans and Dampers			
Supply fan and motor alignment correct	<input type="checkbox"/>	<input type="checkbox"/>	
Supply fan belt tension and condition good	<input type="checkbox"/>	<input type="checkbox"/>	
Supply fan protective shrouds for belts in place and secure	<input type="checkbox"/>	<input type="checkbox"/>	
Supply fan area clean	<input type="checkbox"/>	<input type="checkbox"/>	
Supply fan and motor properly lubricated	<input type="checkbox"/>	<input type="checkbox"/>	
Return/exhaust fan and motor aligned	<input type="checkbox"/>	<input type="checkbox"/>	
Return/exhaust fan belt tension & condition good	<input type="checkbox"/>	<input type="checkbox"/>	

Installation Checks			
Check if acceptable, provide comment if unacceptable		NA	Comment
Return/exhaust fan protective shrouds for belts in place and secure	<input type="checkbox"/>	<input type="checkbox"/>	
Return/exhaust fan area clean	<input type="checkbox"/>	<input type="checkbox"/>	
Return/exhaust fan and motor lube lines installed and lubed	<input type="checkbox"/>	<input type="checkbox"/>	
Filters clean and tight fitting	<input type="checkbox"/>	<input type="checkbox"/>	
Filter pressure differential measuring device installed and functional (magnehelic, inclined manometer, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	
Smoke and fire dampers installed properly per contract docs (proper location, access doors, appropriate ratings verified)	<input type="checkbox"/>	<input type="checkbox"/>	
All dampers close tightly	<input type="checkbox"/>	<input type="checkbox"/>	
All damper actuators installed	<input type="checkbox"/>	<input type="checkbox"/>	
Ducts			
Sound attenuators installed	<input type="checkbox"/>	<input type="checkbox"/>	
Duct joint sealant properly installed	<input type="checkbox"/>	<input type="checkbox"/>	
No apparent severe duct restrictions	<input type="checkbox"/>	<input type="checkbox"/>	
Turning vanes in square elbows as per drawings	<input type="checkbox"/>	<input type="checkbox"/>	
OSA intakes located away from pollutant sources & exhaust outlets	<input type="checkbox"/>	<input type="checkbox"/>	
Pressure leakage tests completed	<input type="checkbox"/>	<input type="checkbox"/>	
Branch duct control dampers operable	<input type="checkbox"/>	<input type="checkbox"/>	
Ducts cleaned as per specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Balancing dampers installed as per drawings and TAB's site visit	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical and Controls			
Power disconnects located within site of the unit it controls and labeled	<input type="checkbox"/>	<input type="checkbox"/>	
All electric connections tight	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding installed for components and unit	<input type="checkbox"/>	<input type="checkbox"/>	
Safeties installed and operational	<input type="checkbox"/>	<input type="checkbox"/>	
Starter overload breakers installed and correct size	<input type="checkbox"/>	<input type="checkbox"/>	
All control devices and wiring complete	<input type="checkbox"/>	<input type="checkbox"/>	
Control system interlocks connected and functional	<input type="checkbox"/>	<input type="checkbox"/>	
Smoke detectors in place	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
VFD			
Installation per manufacturer's requirements and start up instructions completed	<input type="checkbox"/>	<input type="checkbox"/>	
Drive location not subject to excessive moisture or dirt	<input type="checkbox"/>	<input type="checkbox"/>	
Drive location not subject to excessive temperatures	<input type="checkbox"/>	<input type="checkbox"/>	
Appropriate Volts vs. Hz curve is being used	<input type="checkbox"/>	<input type="checkbox"/>	
Drive size matches motor size	<input type="checkbox"/>	<input type="checkbox"/>	
Drive mounted on house keeping pad (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>	
Cooling air flow path clean and unobstructed	<input type="checkbox"/>	<input type="checkbox"/>	
Permanent label affixed and UL stamp approved	<input type="checkbox"/>	<input type="checkbox"/>	

Installation Checks		
Check if acceptable, provide comment if unacceptable	NA	Comment
VFD interlocked to control system	<input type="checkbox"/>	<input type="checkbox"/>
Unit is programmed with full written programming record on site	<input type="checkbox"/>	<input type="checkbox"/>
Accel time set to _____ and Decel time set to _____	<input type="checkbox"/>	<input type="checkbox"/>
Operation checked in HAND, OFF, and AUTO. As applicable operation also checked in BYPASS	<input type="checkbox"/>	<input type="checkbox"/>
Where applicable, ensure safeties are active in all modes	<input type="checkbox"/>	<input type="checkbox"/>
Coordinated with BAS for all interface ranges and signal isolation	<input type="checkbox"/>	<input type="checkbox"/>
Restart on Power Failure parameter set to auto	<input type="checkbox"/>	<input type="checkbox"/>
VFD powered (wired to controlled equipment)	<input type="checkbox"/>	<input type="checkbox"/>
Grounding installed for components and unit	<input type="checkbox"/>	<input type="checkbox"/>
Drive min and max speed set to _____ Hz min and 60 Hz max	<input type="checkbox"/>	<input type="checkbox"/>
Security settings set per Owner direction and Password documented for Owner	<input type="checkbox"/>	<input type="checkbox"/>
Drive response to loss of signal set to _____	<input type="checkbox"/>	<input type="checkbox"/>
Output pulse resolution set to _____ MHz. (This is coordinated with the application to minimize audible noise and coordinated with driven bearing allowances.)	<input type="checkbox"/>	<input type="checkbox"/>
Checked the input voltage with drive disconnected	<input type="checkbox"/>	<input type="checkbox"/>
Input of motor FLA represents 100% to 105% of motor FLA rating	<input type="checkbox"/>	<input type="checkbox"/>
Upper frequency limit set at 100%, unless explained otherwise	<input type="checkbox"/>	<input type="checkbox"/>
Sensors and Gages		
Temperature, pressure and flow gages and sensors installed	<input type="checkbox"/>	<input type="checkbox"/>
Piping gages, BAS and associated panel temperature and pressure readouts match.	<input type="checkbox"/>	<input type="checkbox"/>
TAB		
Installation of system and balancing devices allowed balancing to be completed following specified NEBB or AABC procedures and contract documents	<input type="checkbox"/>	<input type="checkbox"/>

Operational Checks		
Check if acceptable, provide comment if unacceptable	NA	Comments
Supply fan rotation correct (If VFD, check rotation in bypass and VFD Inverter mode)	<input type="checkbox"/>	<input type="checkbox"/>
Return/exhaust fan rotation correct	<input type="checkbox"/>	<input type="checkbox"/>
Return /exhaust fan acceptable noise & vibration	<input type="checkbox"/>	<input type="checkbox"/>
Supply fan has no unusual noise or vibration	<input type="checkbox"/>	<input type="checkbox"/>
Inlet vanes aligned in housing, actuator spanned, modulate smoothly and proportional to input signal and EMS readout	<input type="checkbox"/>	<input type="checkbox"/>
All dampers (OSA, RA, EA, etc.) stroke fully without binding and spans calibrated and BAS reading site verified	<input type="checkbox"/>	<input type="checkbox"/>

Operational Checks			
Check if acceptable, provide comment if unacceptable		NA	Comments
Valves stroke fully and easily and spanning is calibrated	<input type="checkbox"/>	<input type="checkbox"/>	
Valves verified to not be leaking through coils when closed at normal operating pressure	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	

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 01810. 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 need not be field calibrated.

Sensor or Actuator Tag & Location	Location OK	1 st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y / N

Comments:

Plumbing Fixture Construction Checklist

Project:	
Date:	
Building:	
Location:	
Fixture Tag:	

Submittal / Approvals

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, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed.____ **List attached.**

Mechanical Contractor	Date	Controls Contractor	Date
Electrical Contractor	Date	Plumbing Contractor	Date
TAB Contractor	Date	General Contractor	Date

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

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- If this form is not used for documenting, one of similar rigor shall 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.

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

Commissioning Authority	Date	Owner's Representative	Date

Associated Checklists

Plumbing Piping	<input type="checkbox"/>	Domestic Water Heater	<input type="checkbox"/>	Domestic Water Booster System	<input type="checkbox"/>
Other	<input type="checkbox"/>	Other	<input type="checkbox"/>	Other	<input type="checkbox"/>
Comments:					

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Performance data (pump curves, coil data, etc.)	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Comments:		

Installation Checks		
Check if Acceptable; Provide comment if unacceptable	NA	Comment
Installation is per manufacturer's instructions	<input type="checkbox"/>	
Equipment labels permanently affixed	<input type="checkbox"/>	
Pipe fittings complete and properly supported	<input type="checkbox"/>	
Aerators/Strainers in place and clean	<input type="checkbox"/>	
Faucet/flush handles secure and properly aligned	<input type="checkbox"/>	
Installation detail checked against the drawing and all devices and appurtenances are in place	<input type="checkbox"/>	
Associated trim and accessories consistent with contract documents	<input type="checkbox"/>	
Joints between fixtures and walls, floors, and counters sealed	<input type="checkbox"/>	
Insulation installed per requirements	<input type="checkbox"/>	
Fixture consistent with ADA	<input type="checkbox"/>	
Verify hot and cold water connections are on correct side of faucet	<input type="checkbox"/>	
Water Pressure at Hot_____ at Cold_____	<input type="checkbox"/>	
Water temperature _____ (if mixing valve present)	<input type="checkbox"/>	
Automatic flush valves verified for proper operation and sensitivity adjustment	<input type="checkbox"/>	
Automatic sensors verified for proper operation and sensitivity adjustment	<input type="checkbox"/>	

Comments:

TAB Plan Review Checklist

Project:	
Date:	
System:	
Building:	
Location:	

Submittal / Approvals

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TAB Contractor	Date	General Contractor	Date

Checklist items are to be completed as part of startup & initial checkout, preparatory to performing test procedures.

- This checklist does not take the place of the manufacturer's recommended checkout or procedures in standards referenced in the specifications, but is intended to augment them.
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Commissioning Authority	Date	Owner's Representative	Date

Associated Systems					
Air Side	<input type="checkbox"/>	Water Side - Heating Hot Water	<input type="checkbox"/>	Water Side - Chilled Water	<input type="checkbox"/>
Comments:					

Requested documentation submitted	Rec'd	Comments
TAB plan	<input type="checkbox"/>	
TAB procedures	<input type="checkbox"/>	
Sample TAB forms	<input type="checkbox"/>	
Comments:		

General Objectives.

- The purpose of this checklist is to verify that necessary components of the TAB Plan have been included.
- A checkmark indicates that item is included in Plan. If deficient, identify issue in Comment section.

TAB Plan Checklist.

Review Checks			
Check if acceptable, provide comment if unacceptable		NA	Comments
Specified qualifications and certifications of parties performing TAB work submitted and approved	<input type="checkbox"/>	<input type="checkbox"/>	
TAB contractor has reviewed drawings and walked through the site and verified that there are sufficient balancing dampers and valves, isolation dampers and valves and test ports installed to perform TAB per spec. Any deficiencies in design or installation that will adversely affect or preclude proper TAB have been reported.	<input type="checkbox"/>	<input type="checkbox"/>	
TAB contractor has reviewed the construction documents and the systems with the design engineers and contractors to sufficiently understand the design intent for each system	<input type="checkbox"/>	<input type="checkbox"/>	
Prior to plan, TAB contractor had planning meeting with controls contractor to discuss using BAS for TAB	<input type="checkbox"/>	<input type="checkbox"/>	
All field checkout sheets and logs provided as part of plan	<input type="checkbox"/>	<input type="checkbox"/>	

Review Checks			
Check if acceptable, provide comment if unacceptable		NA	Comments
Final test report sheets to be used provided as part of plan	<input type="checkbox"/>	<input type="checkbox"/>	
Field and final test report sheets list each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each	<input type="checkbox"/>	<input type="checkbox"/>	
Discussion of what notations and markings will be made on the duct and piping drawings complete	<input type="checkbox"/>	<input type="checkbox"/>	
List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and provide a description of specific test procedures, parameters, formulas and test instrument type to be used for the measurements Sample forms have been included	<input type="checkbox"/>	<input type="checkbox"/>	
Detailed step-by-step procedures for TAB work include: terminal flow calibration (for each terminal type), diffuser proportioning, branch / submain proportioning, total flow calculations, rechecking, etc. Similar for water side	<input type="checkbox"/>	<input type="checkbox"/>	
Details of how <i>total</i> flow will be determined (Air: sum of terminal flows via BAS calibrated readings or via hood read of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations. Water: pump curves, circuit setter, flow station, ultrasonic, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	
Specific procedures that will ensure (and which can be verified) that both air and water side are operating at the lowest possible pressures	<input type="checkbox"/>	<input type="checkbox"/>	
Outside air ventilation criteria under all conditions clearly understood by TAB contractor	<input type="checkbox"/>	<input type="checkbox"/>	
Details of if and how min. outside air cfm will be verified and set and for what level (total bldg, zone, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	
Details of how building static and exhaust fan / relief damper capacity will be checked	<input type="checkbox"/>	<input type="checkbox"/>	
The identification and types of measurement instruments to be used and their most recent calibration date submitted	<input type="checkbox"/>	<input type="checkbox"/>	
Proposed selection points for sound measurements included	<input type="checkbox"/>	<input type="checkbox"/>	
Details of any TAB work to be done in phases (by floor, etc.), or of areas to be built out later	<input type="checkbox"/>	<input type="checkbox"/>	
Details regarding specified deferred or seasonal TAB work	<input type="checkbox"/>	<input type="checkbox"/>	

Details of any specified false loading of systems to complete TAB work	<input type="checkbox"/>	<input type="checkbox"/>	
Details of all exhaust fan balancing and capacity verifications, including any required room pressure differentials (Not applicable to Heating Hot Water and Chilled Water TAB Plans.)	<input type="checkbox"/>	<input type="checkbox"/>	
Plan for hand-written field technician logs of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests (scope and frequency)	<input type="checkbox"/>	<input type="checkbox"/>	
Plan for formal progress reports (scope and frequency)	<input type="checkbox"/>	<input type="checkbox"/>	
Plan for formal deficiency reports (scope, frequency and distribution)	<input type="checkbox"/>	<input type="checkbox"/>	

Comments:

Fire Alarm System Construction Checklist

Project:	
Date:	
Building:	
Location:	

Submittal / Approvals

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Electrical Contractor	Date	General Contractor	Date

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Commissioning Authority	Date	Owner's Representative	Date

Panel Schedule (Add as required)

Panel Information			
Panel Tag		Panel Location	
System		Service Area	
Manufacturer		Model Number	
Serial Number		Capacity	
Volts/Phase Rating		Starter Mod	
Other		Other	
Comments:			

Associated Checklists			
Other	<input type="checkbox"/>	Other	<input type="checkbox"/>
Comments:			

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty certificate	<input type="checkbox"/>	
Comments:		

Distribution Panel Enclosure/Cabinetry		
Check if Acceptable; Provide comment if unacceptable	NA	Comment
Equipment installed per manufacturer's instructions and specifications	<input type="checkbox"/>	
Equipment installed agrees with shop drawings and specifications	<input type="checkbox"/>	
Verify mounting, location and clearances are per plans and specifications	<input type="checkbox"/>	
Inspect for physical, electrical and mechanical condition of equipment and cabinet - no damage evident	<input type="checkbox"/>	
Inspect panels and doors for proper fit and alignment	<input type="checkbox"/>	

Equipment labels permanently affixed	<input type="checkbox"/>	<input type="checkbox"/>	
Panel is clean and clear of dust or dirt	<input type="checkbox"/>	<input type="checkbox"/>	
Verify the application of manufacturer recommended torque values applied to bolted connections	<input type="checkbox"/>	<input type="checkbox"/>	
Verify correct circuit breaker sizes and types per the specifications and manufacturer's drawings	<input type="checkbox"/>	<input type="checkbox"/>	
Seismic anchoring installed and functional where applicable (non-short circuiting)	<input type="checkbox"/>	<input type="checkbox"/>	
Neutral bus isolated from cabinet	<input type="checkbox"/>	<input type="checkbox"/>	
Verify that ground bus is properly bonded to enclosure, enclosure is grounded and resistance to ground meets grounding specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Inspect insulators, barriers and shields for damage or contamination	<input type="checkbox"/>	<input type="checkbox"/>	
Megger test of bus - phase to phase and phase to ground. Test voltage per manufacturer's recommendations	<input type="checkbox"/>	<input type="checkbox"/>	
Batteries			
Installed per drawings and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
No corrosion or leakage	<input type="checkbox"/>	<input type="checkbox"/>	
Verify tightness of all connections	<input type="checkbox"/>	<input type="checkbox"/>	
Verify electrolyte level is correct (where applicable)	<input type="checkbox"/>	<input type="checkbox"/>	
Terminations torqued per manufacturer's recommendations	<input type="checkbox"/>	<input type="checkbox"/>	
Control Panel			
Mounted in accordance with plans, specifications and manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Adequate service access provided	<input type="checkbox"/>	<input type="checkbox"/>	
Power Supply Connected			
Communications interface/interconnect terminated per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Panel grounded in accordance with manufacturer's instructions and code	<input type="checkbox"/>	<input type="checkbox"/>	

Operational Checks			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
Specified sequences of operation and operating schedules have been provided with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	

Comments:

Panel Construction Checklist

Project:	
Date:	
Building:	
Location:	

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Panel Schedule (Add as required)

Panel Information			
Panel Tag		Panel Location	
System (Circle one)	Power / Lighting	208 - 120 / 480 - 277	Normal / Emergency
Manufacturer		Model Number	
Serial Number		Short Circuit Capacity	
Volts/Phase Rating		Amperage Rating	
Service Area			
Comments:			

Associated Checklists					
Grounding	<input type="checkbox"/>	Lighting	<input type="checkbox"/>	Low Voltage Transformer	<input type="checkbox"/>
Low Voltage MCC	<input type="checkbox"/>	Low Voltage Switchgear	<input type="checkbox"/>	Unit Substation	<input type="checkbox"/>
Unit Substation Transformer	<input type="checkbox"/>	Other	<input type="checkbox"/>	Other	<input type="checkbox"/>
Comments:					

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Distribution Panel Enclosure/Cabinetry			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
Equipment installed per manufacturer's instructions and specifications	<input type="checkbox"/>		
Equipment installed agrees with shop drawings and specifications	<input type="checkbox"/>		
Verify mounting, location and clearances are per plans and specifications	<input type="checkbox"/>		

Inspect for physical, electrical and mechanical condition of equipment and cabinet - no damage evident	<input type="checkbox"/>	<input type="checkbox"/>	
Inspect panels and doors for proper fit and alignment	<input type="checkbox"/>	<input type="checkbox"/>	
Equipment labels permanently affixed	<input type="checkbox"/>	<input type="checkbox"/>	
Panel is clean and clear of dust or dirt	<input type="checkbox"/>	<input type="checkbox"/>	
Verify the application of manufacturer recommended torque values applied to bolted connections	<input type="checkbox"/>	<input type="checkbox"/>	
Verify correct circuit breaker sizes and types per the specifications and manufacturer's drawings	<input type="checkbox"/>	<input type="checkbox"/>	
Inspect insulators, barriers and shields for damage or contamination	<input type="checkbox"/>	<input type="checkbox"/>	
Verify that ground bus is properly bonded to enclosure, enclosure is grounded and resistance to ground meets grounding specifications.	<input type="checkbox"/>	<input type="checkbox"/>	
Neutral bus isolated from cabinet	<input type="checkbox"/>	<input type="checkbox"/>	
Megger test of bus - phase to phase and phase to ground. Test voltage per manufacturer's recommendations.	<input type="checkbox"/>	<input type="checkbox"/>	
Circuit Breakers 208/120 VAC Panels			
Installed per manufacturer's instructions, plans and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
No physical damage	<input type="checkbox"/>	<input type="checkbox"/>	
Verify voltage and current rating of circuit breaker are per plans and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Verify breakers are mounted securely and operates smoothly	<input type="checkbox"/>	<input type="checkbox"/>	
Verify wire is properly installed and suitable size for breaker	<input type="checkbox"/>	<input type="checkbox"/>	
Check cell fit and element alignment	<input type="checkbox"/>	<input type="checkbox"/>	
Check racking mechanism	<input type="checkbox"/>	<input type="checkbox"/>	

Operational Checks			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
Specified sequences of operation and operating schedules have been provided with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	

Comments:

Low Voltage Dry Type Transformer Construction Checklist (under 500 kVA)

Project:	
Date:	
Building:	
Location:	

Submittal / Approvals

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, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed. **List attached.**

Electrical Contractor	Date	General Contractor	Date

Construction checklist items are to be completed as part of startup & initial checkout, preparatory to performing test procedures.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- If this form is not used for documenting, one of similar rigor shall 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.

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

Commissioning Authority	Date	Owner's Representative	Date

Transformer Information			
Equipment Tag		Location	
System (Circle one)	Power / Lighting	208 - 120 / 480 - 277	Normal / Emergency
Manufacturer		Model Number	
Serial Number		kVA	
Volts/Phase Rating		Bus Configuration	
Service Area		Other	
Comments:			

Associated Checklists			
Low Voltage Switchgear	<input type="checkbox"/>	Medium Volt. Switchgear	<input type="checkbox"/>
		Other	<input type="checkbox"/>
Comments:			

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Transformer Enclosure/Cabinetry		
Check if Acceptable; Provide comment if unacceptable	NA	Comment
Equipment installed per manufacturer's instructions and specifications	<input type="checkbox"/>	
Equipment installed agrees with shop drawings and specifications	<input type="checkbox"/>	
Verify mounting, location and clearances are per plans and specifications	<input type="checkbox"/>	
Inspect for physical, electrical and mechanical condition of equipment and cabinet - no damage evident	<input type="checkbox"/>	
Inspect panels and doors for proper fit and alignment	<input type="checkbox"/>	

Equipment labels permanently affixed	<input type="checkbox"/>	<input type="checkbox"/>	
Enclosure is clean and clear of dust or dirt	<input type="checkbox"/>	<input type="checkbox"/>	
Neutral bus isolated from cabinet	<input type="checkbox"/>	<input type="checkbox"/>	
Seismic anchoring installed and functional where applicable (non-short circuiting)	<input type="checkbox"/>	<input type="checkbox"/>	
Inspect insulators, barriers and shields for damage or contamination	<input type="checkbox"/>	<input type="checkbox"/>	
Verify that ground bus is properly bonded to enclosure, enclosure is grounded and resistance to ground meets grounding specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Verify three or four wire configuration	<input type="checkbox"/>	<input type="checkbox"/>	
Metering (if provided) matches specified	<input type="checkbox"/>	<input type="checkbox"/>	
Verify the vents and air inlets are free and unobstructed. Clean air filters installed (if required)	<input type="checkbox"/>	<input type="checkbox"/>	
Megger test of bus - phase to phase and phase to ground. Test voltage per manufacturer's recommendations	<input type="checkbox"/>	<input type="checkbox"/>	

Operational Checks			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
Specified sequences of operation and operating schedules have been provided with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	

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 01810. 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 need not be field calibrated.

Sensor or Actuator Tag & Location	Location OK	1 st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y / N

Comments:

Lighting and Lighting Control Construction Checklist

Project:	
Date:	
Building:	
Location:	

Submittal / Approvals

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, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed. **List attached.**

Electrical Contractor	Date	Controls Contractor	Date
		General Contractor	Date

Construction checklist items are to be completed as part of startup & initial checkout, preparatory to performing test procedures.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- If this form is not used for documenting, one of similar rigor shall 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.

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

Commissioning Authority	Date	Owner's Representative	Date

Associated Checklists			
Panels	<input type="checkbox"/>	Other	<input type="checkbox"/>
<div style="border: 1px solid black; height: 60px; margin-top: 5px;"></div>			

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory Test Results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Installation Checks			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
Lighting			
Devices installed per manufacturer's instructions and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Devices installed agrees with shop drawings and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Verify mounting, location and clearances are per plans and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Lighting control system installed per plans, specifications and manufacturer's recommendations	<input type="checkbox"/>	<input type="checkbox"/>	
Switches, dimmers and occupancy sensors installed at correct height and have correct cover / escutcheon plate	<input type="checkbox"/>	<input type="checkbox"/>	
All zone circuits and inputs are correctly wired, circuits labeled	<input type="checkbox"/>	<input type="checkbox"/>	
Communications interconnection / interface is connected	<input type="checkbox"/>	<input type="checkbox"/>	

Operational Checks			
Check if Acceptable; Provide comment if unacceptable	NA		Comment
Specified sequences of operation and operating schedules have been provided with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	
Lighting control processor powered and battery backup operation checked.	<input type="checkbox"/>	<input type="checkbox"/>	

Lighting control processor diagnostics performed	<input type="checkbox"/>	<input type="checkbox"/>	
Lighting control communications interconnect checked	<input type="checkbox"/>	<input type="checkbox"/>	

Comments:

Grounding System Construction Checklist

Project:	
Date:	
Building:	
Location:	

Submittal / Approvals

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, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed. ___ **List attached.**

Electrical Contractor	Date	General Contractor	Date

Construction checklist items are to be completed as part of startup & initial checkout, preparatory to performing test procedures.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- If this form is not used for documenting, one of similar rigor shall 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.

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

Commissioning Authority	Date	Owner's Representative	Date

Associated Checklists					
Panels	<input type="checkbox"/>	Lighting	<input type="checkbox"/>	Low Voltage Transformer	<input type="checkbox"/>
Low Voltage MCC	<input type="checkbox"/>	Low Voltage Switchgear	<input type="checkbox"/>	Unit Substation	<input type="checkbox"/>
Unit Substat'n Xfmr	<input type="checkbox"/>	Other	<input type="checkbox"/>	Other	<input type="checkbox"/>
Comments:					

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Installation Checks			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
Grounding			
Size and type of grounding and bonding conductors are in accordance with the drawings and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding electrodes have been installed in accordance with drawings and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Connections to grounding electrodes have been made in accordance with manufacturer's specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding conductors have been routed in accordance with the drawings and specifications	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding conductors have been properly terminated at the service equipment or separately derived source. Bonding conductors have been installed as required	<input type="checkbox"/>	<input type="checkbox"/>	
Resistance of the grounding system has been measured and recorded. Provide method of measurement.	<input type="checkbox"/>	<input type="checkbox"/>	
Test wells are accessible and clearly marked.	<input type="checkbox"/>	<input type="checkbox"/>	

Operational Checks		
Check if Acceptable; Provide comment if unacceptable	NA	Comment

Specified sequences of operation and operating schedules have been provided with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	

Comments:

PV- _____

Related Tests: _____

1. Participants

Party

Participation

Party filling out this form and witnessing testing

Dates of testing _____

2. Test Prerequisites

- a. ☐ The following have been started up and startup reports and prefunctional checklists submitted and approved ready for functional testing:
☐ boilers ☐ hot water heating piping
☐ hot water circ. pumps
- b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.
- _____ Controls Contractor Signature or Verbal _____ Date
- c. ☐ Piping system flushing complete and required report approved.
d. ☐ Water treatment system complete and operational.
e. ☐ Vibration control report approved.
f. ☐ Test and balance (TAB) complete and approved for the hydronic system.
g. ☐ All A/E punchlist items for this equipment corrected.
h. ☐ These functional test procedures reviewed and approved by installing contractor.
i. ☐ Safeties and operating ranges reviewed.
j. ☐ Test requirements and sequences of operation attached.
k. ☐ Schedules and setpoints attached.
l. ☐ Sufficient clearance around equipment for servicing.
m. ☐ Have all energy savings control strategies, setpoints and schedules been incorporated that this hot water heating system are capable of? If not, list recommendations below.

Notes:

- n. **___ BAS Program Review.** Review the BAS software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
- o. **___ Packaged Control Program Review.** Review the packaged control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
- p. **___ Record made of All Values for Current Setpoints (SPt), Control Parameters, Limits, Delays, Lockouts, Schedules, Etc. Changed to Accomodate Testing:**

Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>

- 3. Sensor Calibration Checks.** Check the sensors listed below for calibration and adequate location. This is a sampling check of calibrations done during prefunctional checklisting.

"In calibration" means making a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading (via the permanent thermostat, gage or building automation system (BAS)) compared to the test instrument-measured value is within the tolerances specified in the prefunctional checklist requirements (_____). If not, install offset in BAS, calibrate or replace sensor. Use the same test instruments as used for the original calibration, if possible.

Sensor & Location	Location OK ¹	1st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y/N?

¹Sensor location is appropriate and away from causes of erratic operation.

²Rotate setpoint dial on each controller and compare temperature when controller clicks with the temperature gage value. Within 5F is acceptable.

Notes:

- 4. Device Calibration Checks.** The actuators or devices listed below checked for calibration. This is a spot check on a sample of the calibrations done during prefunctional checklisting and startup.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	Expected Value	Site Observation	Final Values	Pass Y/N

5. Verification of Misc. Prefunctional Checks.

Misc. site checks of the prefunctional checklist and startup reports completed successfully. Pass? Y / N _____

6. Testing Procedures and Record

Proced . No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N	Note #

Use the sequence of operation and initial each paragraph to demonstrate testing was performed and completed successfully.

A summary of deficiencies identified during testing is attached

Notes:

Project: _____

PV- _____ UNIT HEATERS

Related Tests: Boilers

1. Participants

Party

Participation

Party filling out this form and witnessing testing

Date of test _____

2. Prerequisite Checklist

- a. The following have been started up and startup reports and prefunctional checklists submitted and approved ready for functional testing: ☐ CHU-1; 2
- b. ☐ Heat exchangers have successfully completed functional testing.
- c. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints, schedules, debugging, loop tuning and sensor calibrations complete.

Controls Contractor Signature or Verbal

Date

- d. ☐ All A/E punchlist items for this equipment corrected.
- e. ☐ Safeties and operating ranges reviewed.
- f. ☐ Test requirements and sequences of operation attached.
- g. ☐ Schedules and setpoints attached.
- h. ☐ Have all energy savings control strategies, setpoints and schedules been incorporated that this equipment and control system are capable of? If not, list recommendations below.
- i. ☐ **BAS Program Review.** Review the BAS software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
- j. ☐ **Packaged Control Program Review.** Review the packaged control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
- k. ☐ Record of All Values for Current Setpoints (SP), Control Parameters, Limits, Delays, Lockouts, Schedules, Etc. Changed to Accommodate Testing:

Notes:

Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>
ON setpoint		
OFF setpoint		

Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>
ON setpoint		
OFF setpoint		

3. Sensor Calibration Checks. Check the sensors listed below for calibration and adequate location. This is a sampling check of calibrations done during prefunctional checklisting. Test the packaged controls and BAS readings.

"In calibration" means making a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading (via the permanent thermostat, gage, packaged control panel or building automation system (BAS)) compared to the test instrument-measured value is within the tolerances specified in the prefunctional checklist requirements (_____).

Sensor & Location	Location OK ¹	1st Gage or Pkg & BAS Values	Instru. Meas'd Value	Final Gage or Pkg & BAS Values	Pass Y/N?
UH stat temp.		Stat:		Stat:	

¹Sensor location is appropriate and away from causes of erratic operation.

4. Device Calibration Checks.

5. Verification of Misc. Prefunctional Checks.

Misc. site checks of the prefunctional checklist and startup reports completed successfully. Pass? Y / N _____

___ Unit mounted securely. ___ Unit accessible for servicing. ___ No unusual noise or vibration in fan.

6. Functional Testing Record

Proced. No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N & Note #

Notes:

Record Foot Notes

¹Sequences of operation specified in Contract Documents (attached).

²Mode or function ID being tested, per testing requirements section of the project Specifications.

³Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

⁴Include tolerances for a passing condition.

⁵Record any permanently changed parameter values and submit to Owner.

Notes:

END

Project _____

PV-_____ TEST AND BALANCE (TAB) CHECKOUT

1. Participants (fill out once, to cover all TAB work)

<u>Party</u>	<u>Participation</u>	<u>Party</u>	<u>Participation</u>
_____	_____	_____	_____
_____	_____	_____	_____

Party filling out this form and witnessing testing _____

Dates of tests _____

2. TAB Scope

The scope of the TAB for this project includes:

- ___ air handling unit, including ___heating and humidification coil capacity verification, ___heat exchanger efficiency verification, ___OA quantity verification
- ___ fan flows for all fans except _____

___ sound level testing in the following areas: _____

___ other: _____

3. Test Prerequisites (fill out once, to cover all TAB recheck work)

- a. The following have been started up and startup reports and prefunctional checklists submitted and approved and the TAB work completed for this equipment and draft TAB report submitted:

___ All air handlers, except _____

___ All terminal units, except _____

___ All fans _____

___ water systems _____

___ Other _____

- b. ___ All control system functions for the above applicable systems and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

Exceptions: _____

Notes:

Controls Contractor Signature or Verbal

Date

- c. ___ All A/E punchlist items for this equipment corrected that may affect TAB, except _____
- d. ___ All deficient items identified during TAB have been addressed and verified to have been corrected, except: _____
- e. ___ These functional test procedures reviewed and approved by TAB contractor.
- f. ___ Verify that final settings of all valves, splitters, dampers and other adjustment devices have been permanently marked by the TAB Contractor. List devices checked: _____

4. Verification Requirements

From interpreting the TAB testing requirements in the specifications, the verification of the following systems will be required:

1. ___ The measured flow of the diffusers and the total maximum and minimum flows of the TU match that of the TAB report for the TU's verified.
2. The discharge velocity of ___% of the diffusers of ___% of the TUs tested.
3. The coil capacity of ___% of the heating coils.
4. The efficiency of ___% of the heat exchangers, which equals _____ units to test.
5. Sound levels in the following areas:

6. ___ Other: _____

5. Acceptance Criteria

According to the specifications, section _____:

A failure¹ of more than 10% of the selected items of a given system² shall result in the failure of acceptance of the final TAB report for that system and the TAB contractor shall be responsible to rebalance the system, provide a new system TAB report and repeat random verifications of the new TAB report.

¹Failure of an item is defined as follows:

For air flow of supply and return: a deviation of more than 10% of instrument reading

Notes:

For minimum outside air flow: 20% of instrument reading (30% for reading at intermediate supply flow for inlet vane or VFD OSA compensation system using linear proportional control)

For temperatures: a deviation of more than 1°C

For air and water pressures: a deviation of more than 10% of full scale of test instrument reading

For sound pressures: a deviation of more than 3 decibels. (Variations in background noise must be considered)

²Examples of a "system" are: the air distribution system served by one air handler or the hydronic chilled water supply system served by a chiller or the condenser water system. Systems can be defined smaller if inaccuracies in TAB work within the smaller defined system will have little or no impact on connected systems.

Notes:

Project:_____

PV-_____ POWER DISTRIBUTION SYSTEM

Related Tests: Boilers

1. Participants

Party

Participation

Party filling out this form and witnessing testing

Date of test _____

2. Prerequisite Checklist

- a. ___ All system functions for this and all interlocking systems are operable per contract documents.

Electrical Contractor Signature or Verbal

Date

- b. ___ All A/E punchlist items for this equipment corrected.
c. ___ Safeties and operating ranges reviewed.
d. ___ Test requirements and sequences of operation attached.
e. ___ Schedules and setpoints attached.
f. ___ Have all energy savings control strategies, setpoints and schedules been incorporated that this equipment and control system are capable of? If not, list recommendations below.
g. ___ **Packaged Control Program Review.** Review the packaged control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
h. ___ Record of All Values for Current Setpoints (SP), Control Parameters, Limits, Delays, Lockouts, Schedules, Etc. Changed to Accommodate Testing:

3. Sensor Calibration Checks.

NONE

4. Device Calibration Checks.

NONE

Notes:

5. Verification of Misc. Prefunctional Checks.

Misc. site checks of the prefunctional checklist and startup reports completed successfully. Pass? Y / N _____

___ Unit mounted securely. ___ Unit accessible for servicing. ___ No unusual noise or vibration in fan.

6. Functional Testing Record

Proced . No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N & Note #

Record Foot Notes

¹Sequences of operation specified in Contract Documents (attached).

²Mode or function ID being tested, per testing requirements section of the project Specifications.

³Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

⁴Include tolerances for a passing condition.

⁵Record any permanently changed parameter values and submit to Owner.

Notes:

END

PV-_____ LIGHTING CONTROLS

1. Participants

Party

Participation

Party filling out this form and witnessing testing

Date of test _____

2. Prerequisite Checklist

- a.____ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints, schedules, debugging and fine tuning of photo-cell parameters.

Controls Contractor Signature or Verbal

Date

- b.____ All A/E punchlist items for this equipment corrected.
c.____ Safeties and operating ranges reviewed.
d.____ Test requirements and sequences of operation attached.
e.____ Schedules and setpoints attached.
f.____ Have all energy savings control strategies, setpoints and schedules been incorporated that this equipment and control system are capable of? If not, list recommendations below.
g. ____ **BAS Program Review.** Review the BAS software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
h.____ Schedule of fixtures on each control type (Parking or Security) has been reviewed.
i.____ Record of All Values for Current Setpoints (SP), Control Parameters, Limits, Delays, Lockouts, Schedules, Etc. Changed to Accommodate Testing:

Notes:

Parameter	Pre-Test Values	Returned to Pre-Test Values √

Parameter	Pre-Test Values	Returned to Pre-Test Values √

- 3. Sensor Calibration Checks.** Check the sensors listed below for calibration and adequate location. This is a sampling check of calibrations done during prefunctional checklisting. Test the packaged controls and BAS readings.

NONE

- 4. Device Calibration Checks.**

NONE

- 5. Verification of Misc. Prefunctional Checks.**

Misc. site checks of the prefunctional checklist and startup reports completed successfully. Pass? Y / N _____

___ Photo-cell (PC) mounted securely. ___ PC mounted where it won't be tampered with. ___ PC mounted so it won't become dirty easily. ___ PC accessible for servicing.

- 6. Functional Testing Record**

Proced . No. & Spec. Seq. ID ¹	Req ID No. ²	Test Procedure ³ (including special conditions)	Expected and Actual Response ⁴ [Write ACTUAL response in brackets or circle]	Pass Y/N & Note #

Record Foot Notes

¹Sequences of operation specified in Contract Documents (attached).

²Mode or function ID being tested, per testing requirements section of the project Specifications.

³Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

⁴Include tolerances for a passing condition.

⁵Record any permanently changed parameter values and submit to Owner.

Notes: