



PROJECT:

PHONE (573) 882-1133

FAX (573) 882-1175

Date:

Boiler Construction Checklist

Project:	
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Date:	
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Chiller Tag:	
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Building:	
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Location:	
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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	Sheet Metal Contractor	Date
TAB 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.

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Commissioning Authority	Date	Owner's Representative	Date
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Boiler 1 Information					
Make			Model Number		
Serial Number			Capacity	GPM	
Volts/Phase	Function	Service Area			
Comments:					

Boiler 2 Information					
Make			Model Number		
Serial Number			Capacity	GPM	
Volts/Phase	Function	Service Area			
Comments:					

Associated Checklists					
Heating Hot Water Pump	<input type="checkbox"/>	Heating Hot Water Piping	<input type="checkbox"/>	BAS	<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"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		



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Installation Checks		
Check if acceptable, provide comment if unacceptable	NA	Comment
General		
General appearance good, no apparent damage	<input type="checkbox"/>	<input type="checkbox"/>
Installation is per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Seismic restraints in place	<input type="checkbox"/>	<input type="checkbox"/>
Pipe fittings and accessories complete	<input type="checkbox"/>	<input type="checkbox"/>
Hydronic system flushing complete and strainers cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Test plugs (P/T) installed near all control sensors and as per spec	<input type="checkbox"/>	<input type="checkbox"/>
Flow switch installed as required	<input type="checkbox"/>	<input type="checkbox"/>
Equipment labels affixed	<input type="checkbox"/>	<input type="checkbox"/>
Tube pull and access door space adequate and to code	<input type="checkbox"/>	<input type="checkbox"/>
Combustion air supply installed	<input type="checkbox"/>	<input type="checkbox"/>
No leaking apparent	<input type="checkbox"/>	<input type="checkbox"/>
Draft Fan (if applicable)		
Fan is installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Casing in good condition; no dents	<input type="checkbox"/>	<input type="checkbox"/>
Mountings checked and shipping bolts removed	<input type="checkbox"/>	<input type="checkbox"/>
Vibration isolators installed	<input type="checkbox"/>	<input type="checkbox"/>
Plenums free of debris	<input type="checkbox"/>	<input type="checkbox"/>
Fan rotates freely and in correct direction	<input type="checkbox"/>	<input type="checkbox"/>
Bearings lubricated	<input type="checkbox"/>	<input type="checkbox"/>
Equipment guards and safety devices installed	<input type="checkbox"/>	<input type="checkbox"/>
Starter installed and size coordinated with motor	<input type="checkbox"/>	<input type="checkbox"/>
Motor correctly aligned	<input type="checkbox"/>	<input type="checkbox"/>
Gas Train		
Gas train Installed in accordance with NFPA, FM and IRI	<input type="checkbox"/>	<input type="checkbox"/>
Gas train checked for leaks	<input type="checkbox"/>	<input type="checkbox"/>
Gas piping installed and tested	<input type="checkbox"/>	<input type="checkbox"/>
Gas train vents are terminated per code	<input type="checkbox"/>	<input type="checkbox"/>



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Check if acceptable, provide comment if unacceptable	NA	Comment
Gas train safety devices are operational	<input type="checkbox"/>	<input type="checkbox"/>
Drip leg provided in gas main	<input type="checkbox"/>	<input type="checkbox"/>
Gas cock valve orientation per manufacturers recommendations	<input type="checkbox"/>	<input type="checkbox"/>
Gas cock valve accessible and travels freely	<input type="checkbox"/>	<input type="checkbox"/>
Gas cock checked for leaks in closed position with the other gas train valves open	<input type="checkbox"/>	<input type="checkbox"/>
Gas meter installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Gas meter properly located in non-turbulent section of pipe	<input type="checkbox"/>	<input type="checkbox"/>
Gas meter is properly oriented	<input type="checkbox"/>	<input type="checkbox"/>
Gas meter is wired correctly	<input type="checkbox"/>	<input type="checkbox"/>
Gas meter is accessible for test and service	<input type="checkbox"/>	<input type="checkbox"/>
Gas pressure adjusted and verified within acceptable range	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed gas PRV operation	<input type="checkbox"/>	<input type="checkbox"/>
Gas pressure sensor limits are appropriate for application	<input type="checkbox"/>	<input type="checkbox"/>
Hi gas pressure switch installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Hi gas pressure switch is properly wired	<input type="checkbox"/>	<input type="checkbox"/>
Low gas pressure switch installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Low gas pressure switch is properly wired	<input type="checkbox"/>	<input type="checkbox"/>
Gas control valve installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Gas control valve installed vertical with direction of flow confirmed	<input type="checkbox"/>	<input type="checkbox"/>
Gas control valve accessible and travels freely	<input type="checkbox"/>	<input type="checkbox"/>
Gas control valve checked for leaks in closed position with the other gas train valves open	<input type="checkbox"/>	<input type="checkbox"/>
Gas control valve had no visible damage	<input type="checkbox"/>	<input type="checkbox"/>
Gas control valve nameplate readings checked against application and is applied correctly	<input type="checkbox"/>	<input type="checkbox"/>
Drum relief valve setting adequate for application	<input type="checkbox"/>	<input type="checkbox"/>
Drum relief valve discharge properly piped	<input type="checkbox"/>	<input type="checkbox"/>
Stop-Check valve pressure rating applicable for duty	<input type="checkbox"/>	<input type="checkbox"/>
Stop-Check valve installed per manufacturers instructions	<input type="checkbox"/>	<input type="checkbox"/>
Piping		
Hydronic piping complete, including blowdown system, makeup water piping and safety reliefs	<input type="checkbox"/>	<input type="checkbox"/>
Piping supported independently of the Boiler	<input type="checkbox"/>	<input type="checkbox"/>
Hydronic system flushing complete and strainers cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Isolation valves and balancing valves installed	<input type="checkbox"/>	<input type="checkbox"/>
Piping type and flow direction labeled on piping	<input type="checkbox"/>	<input type="checkbox"/>



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Installation Checks		
Check if acceptable, provide comment if unacceptable	NA	Comment
Chemical treatment system or plan installed	<input type="checkbox"/>	<input type="checkbox"/>
Unions installed to allow for easy removal of control valves	<input type="checkbox"/>	<input type="checkbox"/>
Electrical and Controls		
Power disconnect is 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"/>
Multiple boiler interlocks completed	<input type="checkbox"/>	<input type="checkbox"/>
Flue		
Installed per manufacturers instructions	<input type="checkbox"/>	<input type="checkbox"/>
Sloped toward boiler	<input type="checkbox"/>	<input type="checkbox"/>
Clearance to combustibles per code	<input type="checkbox"/>	<input type="checkbox"/>
Protection in place to prevent burning hazard	<input type="checkbox"/>	<input type="checkbox"/>
Discharge is protected from rain and blockage	<input type="checkbox"/>	<input type="checkbox"/>
Provisions in place for expansion compensation	<input type="checkbox"/>	<input type="checkbox"/>
Discharge is located to preclude re-entrainment back into the building	<input type="checkbox"/>	<input type="checkbox"/>
Draft checked and meets minimum requirements of boiler manufacturer	<input type="checkbox"/>	<input type="checkbox"/>
Low Water Cutoff		
Installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Wire terminations checked and correct	<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		



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Installation Checks		
Check if acceptable, provide comment if unacceptable	NA	Comment
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
Measure line to line voltage phase imbalance for all three-phase motors: (%Imbalance = 100 x (avg. - lowest) / avg.) Record imbalance of compressor. Imbalance less than 2%?	<input type="checkbox"/>	<input type="checkbox"/>
Record full load running amps for all three-phase motors: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	<input type="checkbox"/>	<input type="checkbox"/>
No unusual noise and vibration when running	<input type="checkbox"/>	<input type="checkbox"/>
Boiler safeties energized and tested	<input type="checkbox"/>	<input type="checkbox"/>
Specified sequences of operation and operating schedules have been implemented 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"/>
Startup report completed with this checklist attached. (Includes full listing of all internal settings with notes as to which settings are BAS controlled or monitored and which are integral.)	<input type="checkbox"/>	<input type="checkbox"/>
Startup report includes written certification from boiler manufacturer that all specified features, controls and safeties have been installed and are functioning properly and that the installation and application comply with the manufacturer's recommendations.	<input type="checkbox"/>	<input type="checkbox"/>
Startup report includes optimal and actual percent CO ₂ , CO, O ₂ , stack temperature; combustion efficiency	<input type="checkbox"/>	<input type="checkbox"/>
Piping gages, BAS and boiler temperature and pressure readouts match (see calibration section below)	<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



Construction Management

University of Missouri-Columbia

Planning, Design & Construction Campus Facilities

117 General Services Building
Columbia, MO 65211-3200

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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:

***Fill out all form fields before signing!**

Name _____ **Organization** _____ **Title** _____ **Signature** _____

University of Missouri Commissioning Authority



(Place Digital Locking Stamp Here)