

<Suggested specification for BOLT® electric water heater with storage tanks as manufactured by Watts Heating and Hot Water Solutions LLC dba Lync by Watts of Fort Worth, Texas.>

SECTION 22 33 13.16 – DOMESTIC WATER HEATERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 1 Specification Sections, apply to this section.

1.2 SUMMARY

This section includes electric water heaters for potable water.

1.3 REFERENCES

- A. UL 1453 “Electric Booster and Commercial Storage Tank Water Heaters”
- B. ASME Boiler and Pressure vessel code, section IV, Part HLW
- C. ASHRAE/IES 90.1-2010
- D. NFPA 70 – National Electric Code
- E. NSF/ANSI Standard 61- Drinking Water System Components
- F. NSF/ANSI Standard 372- Drinking Water System Components – Lead Content

1.4 SUBMITTALS

- A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties and accessories for each model indicated.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, components, and size of each field connection.
- C. Wiring Diagrams: Detail for wiring power signal, differentiate between manufacture-installed and field-installed wiring.
- D. Maintenance Data: Include in the maintenance manuals specified in Division 1. Include maintenance guide and wiring diagrams.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for internal wiring of factory wired equipment.
- B. Units: ETL, UL, or CSA Listed as a Complete Electric Water Heater Assembly.
- C. Conform to ASME Section IV. Part HLW for Duplex Water Heater construction.
- D. Conform to NSF/ANSI Standard 372 – Drinking Water System Components – Lead Content
- E. Conform to ASHRAE/IES 90.1-2010

1.6 QUALITY ASSURANCE

- A. Listing: The water heater will be ETL listed to UL 1453 “Electric Booster and Commercial Storage Tank Water Heaters”
- B. ASME Compliance: Water heater shall bear the ASME HLW stamp and be National Board listed
- C. NSF/ANSI Compliance: Water heater shall conform to the NSF/ANSI 372 by a recognized certifying body.
- D. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum twenty years’ experience.

1.7 COORDINATION

Coordinate size and location of concrete bases.

1.8 WARRANTY

- A. Storage Tank: 25-year coverage (15 years full, 10 years prorated) for manufacturing or material defects, leaks, the production of rusty water and or chloride stress corrosion cracking. Tank warranty does not require inspection and maintenance of anode rods. The warranty shall begin at the date of installation.
- B. All other heater parts: 1 year
- C. The heater shall have a first-year service policy, which shall cover labor and freight costs under certain conditions for warranty covered services.

PART 2 – PRODUCTS (STORAGE TANKS)

2.1 MANUFACTURERS

- A. Available Manufacturers: Manufacturer shall be a company specializing in manufacturing the products specified in this section with twenty years’ experience.
- B. The water heaters shall be ETL listed as a complete unit. The heater shall satisfy current Federal Energy Policy Act standards for both thermal efficiency and standby heat losses.
- C. Manufacturers: Lync by Watts is the basis of design. Acceptable manufacturers shall be subject to compliance with the requirements.

2.2 CONSTRUCTION

- A. The storage section of the water heater shall be ASME HLW stamped and National Board Registered for a maximum allowable working pressure of 150 psi and pressure tested at 1-1/2 times working pressure.
- B. The tank design will include a manway sized access to the tank interior.
- C. Connection sizes shall be 2-1/2” NPT for units 250 gallons up to and including 1000 gallons. Tank shall include a 1” drain valve for units up to and including 250 gallons, and 1-1/2” drain valve for units 500 gallons and larger. Tank shall include a 1” NPT relief valve opening.
- D. The tank shall include an integrated inlet diffuser basket for proper stratification of hot water.

- E. The storage tank shall be an unlined pressure vessel constructed from phase-balanced austenitic and ferritic duplex steel with a chemical structure containing a minimum of 21% chromium to prevent corrosion and mill certified per ASTM A 923 Methods A to ensure that the product is free of detrimental chemical precipitation that affects corrosion resistance.
- F. Waterside surfaces shall be welded internally utilizing joint designs to minimize volume of weld deposit and heat input. All heat affected zones (HAZ) shall be processed after welding to ensure the HAZ corrosion resistance is consistent with the mill condition base metal chemical composition. Weld procedures (amperage, volts, welding speed, filler metals and shielding gases) utilized shall result in a narrow range of austenite-ferrite microstructure content consistent with phase balanced objectives for welds, HAZ and the base metal.
- G. All internal and external tank surfaces shall undergo full immersion passivation and pickling processing to meet critical temperature, duration and chemical concentration controls required to complete corrosion resistance restoration of pressure vessel surfaces. Other passivation and pickling methods are not accepted. Immersion passivation and pickling certification documents are required and shall be provided with each product.
- H. The water heater shall be completely factory packaged on a single skid, requiring only job site hookup for electrical and plumbing.
- I. Pressure relief valve rated to 150 PSI shall be factory installed.
- J. Materials shall meet ASME Section II material requirements and be accepted by NSF 61 for municipal potable water systems. Storage tank materials shall contain more than 80% post-consumer recycled materials and be 100% recyclable.
- K. Water contacting tank surfaces will be non-porous and exhibit 0% water absorption.
- L. Internally lined or plated storage tanks will not be acceptable.
- M. Water heaters that require anodes will not be acceptable.
- N. Heating elements for 36 kW, 72 kW, and 108 kW units will be rated at 9 kW and 40 watts per square inch heat density. Units with 144 kW input will include heating elements rated at 9 kW and 40 watts per square inch as well as heating elements rated at 18 kW and 80 watts per square inch.
- O. Heating elements will be sheathed in Incoloy. Each element will individually mount to the tank by means of a four-bolt bronze flange over stainless steel studs with an O-ring seal. A fused magnetic contactor will be supplied for each power circuit. Maximum current per circuit will be 50 amps on three-phase units.
- P. The storage tank will not require anodes of any type and none will be used.
- Q. Tanks intended for outdoor installation shall be coated in a weatherproof lining material.

2.3 PERFORMANCE

- A. Duplex storage tank shall exceed the tank insulation requirements of ASHRAE 90.1-2010 and include R-22 insulation.

2.4 WATER HEATER TRIM

- A. As a minimum, the heater will be equipped with the following:
 - a. An electronic low water cutoff

- b. An *immersion* operating thermostat
 - c. *Immersion* temperature limiting device
 - d. An ASME rated temperature and pressure relief valve
- B. Operating and safety controls shall meet the requirements of UL 1453. Operating and safety controls shall meet the requirements of MASS code.
- C. The water heater shall employ an electronic operating control with digital temperature readout. Operator shall be capable of connecting to a building automation system through serial connection using Modbus RTU protocol.
- D. < OPTIONAL > A protocol gateway for BACnet MSTP/IP will be provided.
- E. < OPTIONAL > A protocol gateway for LonWorks will be provided.
- F. < OPTIONAL > A protocol gateway for Modbus TCP/IP will be provided.
- G. < OPTIONAL > Outdoor models shall be jacketed with Rhino lining coated steel panels.

PART 3 – EXECUTION

3.1 INSTALLATION

Install water heaters level and plumb in accordance with manufacturers written instructions and referenced standards.

3.2 FINISHING

The heater shall be insulated to ASHRAE 90.1-2010 requirements or higher and mounted on heavy-duty channel skids. Outdoor models shall be jacketed with Rhino lining coated steel panels. The heater shall fit properly in the space provided and installation shall conform to all local, state, and national codes.

3.3 START-UP

Start up on the unit will be performed by factory trained and authorized personnel. A copy of the startup report will be provided to the owner.