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Typical Specification

NKC-SPEC-01

Typical Specification for Lochinvar® Noble Combination Boiler

Models 110,000 – 199,999 Btu/Hr

The **COMBINATION BOILER** shall be a **LOCHINVAR NOBLE** Model **NKC**_____having a modulating input rating of _____ Btu/Hr, an output of _____ Btu/Hr and shall be operated on (Natural Gas) (L.P. Gas). The **COMBINATION BOILER** shall be capable of full modulation, firing down to 10% of rated input with a turndown ratio of 10:1. **COMBINATION BOILER** shall be designed, engineered and assembled in the United States of America.

The **COMBINATION BOILER** shall be of a fire tube design and shall be vertically down fired. The **COMBINATION BOILER** shall bear the ASME "H" stamp for 50 psi working pressure and shall be National Board listed. The heat exchanger assembly shall be fully welded through an automated process to ensure weld integrity. The stainless steel combustion chamber and tubes shall be self-cleaning and designed to drain condensation to the bottom of the heat exchanger assembly. A built-in flue collector shall allow condensation to drain from the heat exchanger assembly and into the external condensate trap. The complete heat exchanger assembly shall carry a ten (10) year warranty.

The **COMBINATION BOILER** shall be certified and listed by C.S.A. International under the latest edition of the harmonized ANSI Z21.13 /CSA4.9 test standard for the U.S. and Canada. The **COMBINATION BOILER** shall comply with the energy efficiency requirements of the latest edition of the ASHRAE 90.1 Standard and the minimum efficiency requirements of the latest edition of the ASHRAE 103 Standard. The **COMBINATION BOILER** shall meet U.S. Environmental Protection Agency and Department of Energy guidelines for "Energy Star" efficiency. The **COMBINATION BOILER** shall operate at a minimum of 95% Annual Fuel Utilization Efficiency. The **COMBINATION BOILER** shall be certified for indoor installation. The **COMBINATION BOILER's** efficiency ratings shall be verified through third party testing by the Hydronics Institute Division of AHRI and listed in the AHRI Certification Directory.

The **COMBINATION BOILER** shall be constructed with a heavy gauge steel jacket assembly, primed and pre-painted on both sides. The combustion chamber shall be sealed and completely enclosed, independent of the outer jacket assembly, so that integrity of the outer jacket does not affect a proper seal. A burner/flame observation port shall be provided. The burner shall be a premix design and constructed of high temperature stainless steel with a woven metal fiber outer covering to provide modulating firing rates. The **COMBINATION BOILER** shall be supplied with a gas valve designed with negative pressure regulation and be equipped with a variable speed blower system, to precisely control the fuel/air mixture to provide modulating boiler firing rates for maximum efficiency. The **COMBINATION BOILER** shall operate in a safe condition at a derated output with gas supply pressures as low as 4 inches of water column.

The **COMBINATION BOILER** shall be constructed with an internal brazed plat heat exchanger, diverter valve and pump for domestic hot water production. The **COMBINATION BOILER** shall have minimum performance of 2.6 GPM@77˚F rise during domestic hot water production (NKC110N) and maximum performance of 4.8 GPM@77˚F rise during domestic hot water production (NKC199N).

The **COMBINATION BOILER** shall utilize a 24 VAC control circuit and components. The control system shall have an electronic display using words not codes for boiler set-up, boiler status, and boiler diagnostics. All components shall be easily accessed and serviceable from the front and top of the jacket. The **COMBINATION BOILER** shall be equipped with; a temperature/pressure gauge, high limit temperature control certified to UL353, ASME certified pressure relief valve, outlet water temperature sensor, return water temperature sensor, a UL 353 certified flue temperature sensor, outdoor air sensor, low water flow protection and built-in freeze protection.

The **COMBINATION BOILER** shall feature the "Smart Control" control with a Graphic Electronic LCD display with password security, setpoint with outdoor air reset curve, pump delay with freeze protection, pump exercise, domestic hot water prioritization, combi preheat and domestic hot water response mode. The **COMBINATION BOILER** shall have the capability to limit the heating Btu's produced by the boiler, space heat limiting. The Boiler shall have a built-in "Cascade" for space heat operation. Supply voltage shall be 120 volt / 60 hertz / single phase.

The **COMBINATION BOILER** shall be equipped with a low voltage connection board with data points for safety and operating controls, i.e., Auxiliary Limit, Manual Reset Low Water Cutoff, Flow Switch, Outdoor Sensor, System Sensor,

Heat Demand, Air Handler Contacts and Cascade Control Circuit.

The **COMBINATION BOILER** shall be installed and vented with a (select one):

(a) Direct Vent Sidewall system with a horizontal sidewall termination of both the vent and combustion air. The flue shall be PVC, CPVC or Stainless Steel sealed vent material terminating at the sidewall with the manufacturers specified vent termination. A separate pipe shall supply combustion air directly to the **COMBINATION BOILER** from the outside. The air inlet pipe may be PVC, CPVC, ABS, Galvanized, Dryer Vent, or Stainless Steel sealed pipe. The air inlet must terminate on the same sidewall with the manufacturer's specified air inlet cap. The **COMBINATION BOILER's** total combined air intake length shall not exceed 100 equivalent feet. The **COMBINATION BOILER's** total combined exhaust venting length shall not exceed 100 equivalent feet. ***Foam Core pipe is not an approved material for exhaust piping.***

(b) Direct Vent Vertical system with a vertical roof top termination of both the vent and combustion air. The flue shall be PVC, CPVC or Stainless Steel sealed vent material terminating at the roof top with the manufacturers specified vent termination. A separate pipe shall supply combustion air directly to the **COMBINATION BOILER** from the outside. The air inlet pipe may be PVC, CPVC, ABS, Galvanized, Dryer Vent, or Stainless Steel sealed pipe. The air inlet must terminate on the roof top with the manufacturer's specified air inlet cap. The **COMBINATION BOILER's** total combined air intake length shall not exceed 100 equivalent feet. The **COMBINATION BOILER's** total combined exhaust venting length shall not exceed 100 equivalent feet. ***Foam Core pipe is not an approved material for exhaust piping.***

(c) Vertical Vent with Sidewall Air system with a vertical rooftop termination of the vent with the combustion air being drawn horizontally from a sidewall. The flue shall be PVC, CPVC, or Stainless Steel sealed vent material terminating at the roof top with the manufacturers specified vent termination. A separate pipe shall supply combustion air directly to the **COMBINATION BOILER** from the outside. The air inlet may be PVC, CPVC, ABS, Galvanized, Dryer Vent, or Stainless Steel sealed pipe. The air inlet must terminate on a sidewall using the manufacturers specified air inlet cap. The **COMBINATION BOILER's** total combined air intake length shall not exceed 100 equivalent feet. The **COMBINATION BOILER's** total combined exhaust venting length shall not exceed 100 equivalent feet. ***Foam Core pipe is not an approved material for exhaust piping.***

The **COMBINATION BOILER** shall have an independent laboratory rating for Oxides of Nitrogen (NO_x) of 20 ppm or less corrected to 3% O_2. The manufacturer shall verify proper operation of the burner, all controls and the heat exchanger by connection to water and venting for a factory fire test prior to shipping.

The **COMBINATION BOILER** shall operate at altitudes up to 5,000 feet above sea level with 0% de-rate.

The **COMBINATION BOILER** shall be suitable for use with polypropylene glycol, up to 50% concentration without contingencies.

Maximum unit dimensions shall be: Length _____inches, Width _____inches and Height _____ inches. Maximum unit weight shall be_____pounds.

The Firing Control System shall be _____ (Options Below).

M9 Direct Spark Ignition with Electronic Supervision, California Code