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| **Typical Specification** |
| **SWH-SPEC-09** |

**Typical Specification for Lochinvar® *SHIELD* Water Heater**

***Non-ASME models: SWR125(N,L); SWR150(N,L); SWR200(N,L); SWR285(N,L); SWR400(N,L)
ASME models: SWA150(N,L); SWA200(N,L); SWA285(N,L); SWA400(N,L); SWA500(N,L)***

The **WATER HEATER** shall be a **LOCHINVAR SHIELD** Model **SW(R,A)\_\_\_\_\_\_\_\_\_\_\_\_(N,L)** having a maximum input rating of \_\_\_\_\_\_\_\_\_\_\_\_\_ Btu/Hr, a recovery capacity of **\_\_\_\_\_\_\_\_\_** gallons per hour at a 100oF rise and shall be operated on (Natural Gas) or (LP Gas). The **WATER HEATER** shall be capable of full modulation firing down to 20% of rated input with a 5:1 turndown ratio. Note: SWR285N and SWR400N are non-AMSE models. Check local and state codes for allowance of non-ASME models over 200,000 Btu/hr input.

The **WATER HEATER** shall consist of a direct fired Stainless Steel heat exchanger mounted on top of a glass lined storage tank in a fashion that will reduce the amount of scale build-up that is known to reduce efficiency. The **WATER HEATER** shall have no visible pipes that connect the heat exchanger to the storage tank. There shall be no banding material, bolts, gaskets or "O" rings in the construction of the heat exchanger header. The Stainless Steel combustion chamber shall be designed to drain condensation to the bottom of the heat exchanger assembly. A built-in trap shall allow condensation to drain from the heat exchanger assembly. The **WATER HEATER** shall carry a three (3) year heat exchanger and tank warranty and a one (1) year parts warranty.

Specified **“SNA” SHIELD** **WATER HEATERS** shall bear the ASME “HLW” stamp and shall be National Board listed. The tank shall have a working pressure of 150 psi. The tank shall be glass lined and fired to 1600°F to ensure a molecular fusing of glass and steel. The tank shall be completely encased in high density insulation of sufficient thickness to meet the energy efficiency requirements of the latest edition of the ASHRAE 90.1 Standard. The tank shall be fitted with a brass drain valve.

The **WATER HEATER** shall be certified and listed by C.S.A. International under the latest edition of the harmonized ANSI Z21.10.3 test standard for the US and Canada. The **WATER HEATER** shall comply with the energy efficiency requirements of the latest edition of the ASHRAE 90.1 standard. The **WATER HEATER** shall be certified for indoor installation. The **WATER HEATER’s** efficiency shall be verified through third party testing by AHRI and listed in the AHRI Certification Directory.

The **WATER HEATER** 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 **WATER HEATER** 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 firing rates for maximum efficiency. The **WATER HEATER** shall operate in a safe condition at a de-rated output with gas supply pressures as low as 4 inches of water column.

The **WATER HEATER** shall utilize a 24 VAC control circuit and components. The control system shall have an electronic display for setup, status and diagnostics. All electronic circuitry shall be easily accessed and serviceable from the front of the jacket. The **WATER HEATER** shall be equipped with; a circulating pump; high limit temperature control; ASME certified temperature and pressure relief valve; inlet & outlet water temperature sensors; flue temperature sensor; runtime contacts; alarm contacts; low water flow protection, contacts for louvers, security protection, adjustable pump delay, enable/disable contacts and built-in freeze protection. The control shall have optional capability to communicate via Modbus or BACnet protocol and capability for optional CON-X-US remote connectivity. The manufacturer shall verify proper operation of the burner, all controls and the heat exchanger by connection to water and venting for a factory operation test prior to shipping.

The **WATER HEATER** shall feature the SMART CONTROL platform with pump delay, freeze protection, pump exercise and Start-Up Wizard operating with an LCD display and soft key pad. The **WATER HEATER** shall be equipped with an eight foot power cord. Supply voltage shall be 120 volt / 60 hertz / single phase.

The **WATER HEATER** 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, Polypropylene 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 **WATER HEATER** from the outside. The air inlet pipe may be PVC, CPVC, Polypropylene, 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 total combined air intake length shall not exceed 150 equivalent feet. The total combined exhaust venting length shall not exceed 150 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, Polypropylene 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 **WATER HEATER** from the outside. The air inlet pipe may be PVC, CPVC, Polypropylene, 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 total combined air intake length shall not exceed 150 equivalent feet. The total combined exhaust venting length shall not exceed 150 equivalent feet. ***Foam Core pipe is not an approved material for exhaust piping.***

**(c) Sidewall Vent with Room Air** system with a horizontal sidewall termination of the vent with the combustion air drawn from the interior if the building. The flue shall be PVC, CPVC, Polypropylene or Stainless Steel sealed vent material terminating at the sidewall with the manufacturers specified vent termination. . The total combined exhaust venting length shall not exceed 150 equivalent feet. ***Foam Core pipe is not an approved material for exhaust piping.***

**(d) Vertical Vent with Room Air**system with a vertical rooftop termination of the vent with the combustion air drawn from the interior of the building. The flue shall be PVC, CPVC, Polypropylene or Stainless Steel sealed vent material terminating at the rooftop with the manufacturers specified vent termination. The total combined exhaust venting length shall not exceed 150 equivalent feet. ***Foam Core pipe is not an approved material for exhaust piping.***

**(e) 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, Polypropylene, 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 **Water Heater** from the outside. The air inlet may be PVC, CPVC, Polypropylene, 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 total combined air intake length shall not exceed 150 equivalent feet. The total combined exhaust venting length shall not exceed 150 equivalent feet. ***Foam Core pipe is not an approved material for exhaust piping.***

The **WATER HEATER** shall be approved for 180°F operation. The **WATER HEATER** shall have an independent laboratory rating for Oxides of Nitrogen (NOx) of 20 ppm or less, corrected to 3% O2. The **WATER HEATER** shall operate at altitudes up to 4,500 feet above sea level without additional parts or adjustments.

Maximum unit dimensions shall be: Width \_\_\_\_\_\_\_\_inches and Height \_\_\_\_\_\_\_\_\_\_ inches. Maximum unit weight shall be\_\_\_\_\_\_\_\_\_pounds.

The Firing Control System shall be **M9, Direct Spark Ignition with Electronic Supervision.**

4/20 – Printed in U.S.A.