OWB86 OIL-FIRED WATER BOILER

RESIDENTIAL
PRODUCT SPECIFICATIONS

WATER HEATING / BOILERS

Oil-Fired Water Boiler - 60 Hz
Bulletin No. 210928
January 2021

AFUE up to 86.2%
Heating Input ~ 112,000 to 217,000 Btuh

NOTE - OWB86 OIL BOILERS ARE NOT AVAILABLE IN CANADA!

MODEL NUMBER IDENTIFICATION

OWB 86 - 3 - 01

Series
OWB = Oil-Fired Water Boiler

AFUE
86 = 86%

Revision Number
01 = 1st Generation

Number of Boiler Sections
3 = Three Sections
4 = Four Sections
5 = Five Sections
APPROVALS AND WARRANTY

APPROVALS

• AHRI Certified
• Annual Fuel Utilization Efficiencies based on US DOE test procedures and FTC labeling regulations
• Certified by CSA International for the U.S.
• Boiler heat exchanger assemblies are constructed and hydrostatically tested in accordance with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section IV Standards for cast iron heating boilers

WARRANTY

• Cast iron boiler assembly:
  • Limited twenty years in residential applications only
  • Limited one year in non-residential applications
• All other covered components:
  • Limited five-years in residential applications
  • Limited one year in non-residential installations

NOTE - Refer to Lennox Equipment Limited Warranty certificate included with unit for specific details.

FEATURES

APPLICATIONS

• Three models with heating inputs of 112,000 to 217,000 Btuh
• AFUE - Up to 86.2%
• May be used in a wide variety of applications including radiant floor heating, baseboard heating and zoned heating systems
• Compact size allows easy installation in a basement or utility room
• Each unit factory test operated to ensure proper operation

HEATING SYSTEM

Beckett™ Flame-Retention AFG Oil Burner
• Smooth operating, high-pressure atomizing type burner blends oil and air to attain maximum efficiency
• Heavy duty motor drives quiet operating blower wheel and fuel pump
• Air turbo injector directs combustion air for smooth ignition
• Flame retention head is designed to agitate and mix oil and air for complete combustion and highest efficiency

• 120VAC primary safety control and ceramic glazed electrodes which provide a safe continuous flame
• Factory installed cadmium sulfide cell flame detector and primary safety control that provides complete shutdown in case of flame failure
• All burner parts are easily removable for servicing
• Burner is U.L. listed, C.S.A. according to ANSI Standard 296
• Burner is factory installed and wired in the unit
• Nozzle is furnished and factory installed

NOTE - OWB86-4 model is shipped for higher 175k heating capacity operation.
140k nozzle is furnished with the unit for field changeout if lower heating capacity is required.
• Burner mounted swing door allows complete access to combustion chamber and burner end cone for set-up, maintenance and cleaning
• Eliminates complete burner removal
• Solenoid delay oil valve ensures positive fuel shut-off and eliminates “after-drip”
• Also provides improved burner operation, cleaner combustion and quiet operation
HEATING SYSTEM (continued)

Cast Iron Boiler Assembly
- Boiler sections and push nipples constructed of long life cast iron
- Boiler sections and push nipples expand and contract together, providing positive watertight seal
- Thermal pin design increases heat transfer efficiency
- Wet base design allows water circulation over complete heat exchanger surface for maximum heat transfer
- Boiler components are easily accessible for cleaning and servicing
- Target wall of combustion chamber is constructed of vacuum formed refractory ceramic fiber allowing maximum high temperatures for more complete combustion and higher efficiencies
- Peephole in the cast iron burner swing door allows flame inspection and overfire draft measurement
- Jacket attaches directly to cast iron heat exchanger for increased stability when handling product

Water Circulating Pump
- Constructed of cast iron
- Pump motor is impedance protected
- Motor and impeller is removeable as a single unit for servicing
- Pump is shipped separately ready for field installation

Relief Valve
- Furnished as standard for field installation in rear of cabinet
- Valve provides for pressure relief of heating system in case of abnormal operating conditions
- Valve opens at 30 psig
- ASME approved

Brass Drain Valve
- 3/4 in. brass drain valve is furnished for field installation in drain outlet on front of cabinet
- See dimension drawing for location

Optional Accessories

Tankless Hot Water Coil
- Tankless water heater coil supplies a moderate amount of instantaneous hot water for kitchen, bath and laundry usage
- Low limit control is furnished for field installation on tankless coil control well to maximize hot water heating performance for instantaneous heating
- Raised coil port extends through jacket to allow easy servicing and inspection of tankless coil without removing panels
- Water line connections are furnished on side of boiler cabinet
- See dimension drawing

VENTING

Barometric Draft Control
- Furnished as standard equipment for field installation in flue pipe

Flue Brush
- Furnished with unit for cleaning flue passageways

CONTROLS

Advanced Burner Control
- 120 VAC primary safety control
- Controls the oil burner motor and igniter
- Control features:
  - Welded Relay Protection
  - Limited Reset and Limited Recycle
  - Reset Button - Resets burner if a restricted lockout is present
  - 3 Status Lights for System Monitoring and Diagnostics
    - Yellow - Pump Prime Mode
    - Green - Flame sensing (flashing = 60 second recycle)
    - Red - Restricted Lockout (flashing = Soft lockout)
      "Strike three" lockout protection to avoid nuisance calls
  - Valve-On Delay / Motor-Off Delay
  - 15 Second Lockout Time
  - Interrupted or Intermittent Duty Ignition
  - Technician Pump Priming Mode
  - Disable Function

Combination Temperature/Pressure Gauge
- Located on top of unit cabinet
- Monitors system for safe and reliable operation

Optional Accessories

Thermostat
- Thermostat is not furnished with unit
- Lennox Price Book for selection

CABINET
- Heavy gauge steel
- Thermosetting polyester paint finish
- Fully insulated with fiberglass insulation to keep cabinet surface temperatures low
- Top and front cabinet access allows easy cleaning and servicing of unit
## SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>Model No.</th>
<th>OWB86-3</th>
<th>OWB86-4</th>
<th>OWB86-5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil Heating Performance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burner input - U.S. gallons oil/hour</td>
<td>¹</td>
<td>0.80</td>
<td>¹ 1.00</td>
<td>1.25</td>
</tr>
<tr>
<td>Input - mBtuh</td>
<td></td>
<td>112</td>
<td>¹ 140</td>
<td>175</td>
</tr>
<tr>
<td>Heating Capacity - mBtuh</td>
<td>²</td>
<td>98</td>
<td>¹ 122</td>
<td>152</td>
</tr>
<tr>
<td>Net AHRI Rating - mBtuh</td>
<td>³</td>
<td>85</td>
<td>¹ 106</td>
<td>132</td>
</tr>
<tr>
<td>AFUE</td>
<td></td>
<td>86.0%</td>
<td>⁵ 86.2%</td>
<td>86.0%</td>
</tr>
<tr>
<td><strong>Boiler</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of boiler sections</td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Net boiler heating surface - sq. ft.</td>
<td></td>
<td>18.54</td>
<td>25.16</td>
<td>31.78</td>
</tr>
<tr>
<td>Boiler capacity - U.S. gallons</td>
<td></td>
<td>9.6</td>
<td>11.6</td>
<td>13.7</td>
</tr>
<tr>
<td><strong>Oil Burner Pump</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>1 stage (150 psi)</td>
<td>1 stage (155 psi)</td>
<td>1 stage (155 psi)</td>
<td></td>
</tr>
<tr>
<td>Oil piping size N.P.T.</td>
<td>¹/₄</td>
<td>¹/₄</td>
<td>¹/₄</td>
<td></td>
</tr>
<tr>
<td>Flue size diameter</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Water supply size N.P.T.</td>
<td>1-1/₄</td>
<td>1-1/₄</td>
<td>1-1/₄</td>
<td></td>
</tr>
<tr>
<td>Water return size N.P.T.</td>
<td>1-1/₄</td>
<td>1-1/₄</td>
<td>1-1/₄</td>
<td></td>
</tr>
<tr>
<td><strong>Shipping Data - lbs. (1 package)</strong></td>
<td>483</td>
<td>554</td>
<td>627</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>120 volts - 60 hertz - 1 phase (less than 12 amps)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Based on 140,000 Btuh per gallon.
² Heating capacity based on 13% CO₃ with 0.02 in. w.g. draft over fire and #1 smoke or less.
³ Net AHRI ratings indicate the amount of heat each boiler will produce under normal conditions and thermostatic control.
AHRI water ratings are based on an allowance of 1.15 in accordance with the factors shown in the Operations Manual of the AHRI Residential Boilers Certification Program.
Selection of boiler size should be based on “Net AHRI Rating” being equal to or greater than the calculated heat loss of the building.
⁴ Annual Fuel Utilization Efficiency based on U.S. DOE test procedures and FTC labeling regulations.
⁵ With furnished 140k nozzle.
### WATER HEATING/STORAGE

<table>
<thead>
<tr>
<th>Model No.</th>
<th>OWB86-3</th>
<th>OWB86-4</th>
<th>OWB86-5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tankless Water Heater</strong></td>
<td>27M20</td>
<td>27M20</td>
<td>27M20</td>
</tr>
<tr>
<td><strong>Burner input - U.S. gallons oil/hour</strong></td>
<td>0.80</td>
<td>³ 1.00</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Tankless rating - U.S. gallons/minute</strong></td>
<td>3.05</td>
<td>³ 3.25</td>
<td>3.50</td>
</tr>
<tr>
<td><strong>Water supply/return size N.P.T.</strong></td>
<td>1/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indirect Water Heater - 316L Stainless Steel Tank/Coil</strong></td>
<td>40 US gallons</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 US gallons</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PLUMBING

- Automatic Air Vent Valve (3/4 in. sweat) | 29K49 |
- Automatic Air Vent Valve (1 in. sweat) | 29K50 |
- Air Eliminator (1 in. sweat) | X6447 |
- Air Eliminator (1-1/4 in. sweat) | X6449 |
- Boiler Trim Kit w/ Check Valve, 1 in. NPT Air Eliminator, 4.4 Gal. Expansion Tank | X6524 |
- Boiler Trim Kit w/ Check Valve, 1-1/4 in. NPT Air Eliminator, 4.4 Gal. Expansion Tank | X6525 |
- Flow Check Valve (3/4 in.) | 78Y08 |
- Water Mixing Valve (3/4 in.) | 99L99 |
- Water Mixing Valve (1 in.) | 10M00 |

### ZONING

- Boiler Reset Control - Used with Zone Pump Control - Boiler and Outdoor Sensors furnished | X2965 |
- Zone Pump Control - Four Zones (expandable to 15 zones with Expansion Module) | 20X37 |
- Zone Pump Control - Six Zones (expandable to 15 zones with Expansion Module) | 20X38 |
- Boiler Control Expansion Module (One Zone with 18 in. cable) | 20X35 |
- Boiler Control Expansion Module (Four Zones with 18 in. cable) | 20X36 |
- Zone Valve Control - Four Zones with Priority | 20X39 |
- Zone Valve Control - Six Zones with Priority | 20X40 |
- Zone Valve (3/4 in.) | 78Y03 |
- Zone Valve (1 in.) | 78Y04 |
- Zone Valve (1-1/4 in.) | 78Y05 |

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1 Water heated from 40°F to 140°F with 200°F boiler water temperature, intermittent draw.
2 Based on 140,000 Btu/h per gallon.
³ With furnished 140k nozzle.
### Model Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in.</td>
<td>mm</td>
</tr>
<tr>
<td>OWB86-3</td>
<td>14-1/2</td>
<td>368</td>
</tr>
<tr>
<td>OWB86-4</td>
<td>17-3/4</td>
<td>451</td>
</tr>
<tr>
<td>OWB86-5</td>
<td>21</td>
<td>533</td>
</tr>
</tbody>
</table>

### Installation Clearances

<table>
<thead>
<tr>
<th>Side</th>
<th>Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Side</td>
<td>6 inches (152 mm)</td>
</tr>
<tr>
<td>Right Side</td>
<td>24 inches (610 mm)</td>
</tr>
<tr>
<td>Rear</td>
<td>6 inches (152 mm)</td>
</tr>
<tr>
<td>Top</td>
<td>6 inches (152 mm)</td>
</tr>
<tr>
<td>Top (Service)</td>
<td>24 inches (610 mm)</td>
</tr>
<tr>
<td>Front</td>
<td>24 inches (610 mm)</td>
</tr>
<tr>
<td>Front (Service)</td>
<td>24 inches (610 mm)</td>
</tr>
<tr>
<td>¹ Floor</td>
<td>¹ Non-Combustible</td>
</tr>
<tr>
<td>Flue Pipe to Combustible</td>
<td>9 inches (229 mm)</td>
</tr>
</tbody>
</table>

**NOTE** - Fresh air for combustion and ventilation must be provided in accordance with NFPA-31 “Standard for the Installation of Oil-Burning Equipment” or applicable provisions of local building codes.

¹ Boiler is permitted to be placed on combustible floor provided the floor under the boiler is protected in accordance with the requirements of accepted building code practice and approved by the Authority Having Jurisdiction. In the absence of local codes, follow NFPA-31 “Standard for the Installation of Oil-Burning Equipment”.

**DIMENSIONS**

![Diagram](image-url)
*007 Pump furnished with all boilers.