THE BEST KNIGHT EVER

95% AFUE Efficiency

HIGH EFFICIENCY RESIDENTIAL BOILERS

15/5 YEAR HEAT EXCHANGER 
15 YEAR PARTS WARRANTY

SMART SYSTEM

CONXUS Capable

DESIGNED ★ ENGINEERED ★ ASSEMBLED

USA

Lochinvar®
A HISTORY OF INNOVATION

For nearly 80 years, Lochinvar, an American company, has been a leader of innovation and high-efficiency water heating. Through Lochinvar’s pride in leadership and commitment to excellence, the company has continually improved year after year.

Today, Lochinvar touts the broadest line of high-efficiency water heating solutions, a world-class research & development department, comprehensive service with every sale and industry-leading training through Lochinvar University.

NO ONE BRINGS IT ALL TOGETHER LIKE LOCHINVAR

Lochinvar is the industry leader that other leading companies call upon for the most advanced and efficient water heating products in the world. For that reason, Lochinvar is trusted to go beyond the call of duty to find a solution for every project, no matter the size. You will not find a water heating company that works harder or cares more.

That’s why no one brings it all together quite like Lochinvar.
ALWAYS LEADING THE CHARGE

Introduced in 2005, the KNIGHT® boiler was a major step forward for Lochinvar. Designed for both new construction and replacement applications, the KNIGHT quickly became recognized by the industry as the gold standard for installation flexibility and ease of serviceability.

In 2008, the KNIGHT boiler line was broadened to reach up to 800,000 BTU/hr with the introduction of the KNIGHT XL residential and light commercial boiler, and in 2010 a new and innovative SMART SYSTEM™ control was added to both the KNIGHT and KNIGHT XL boiler products to enhance their feature set.

The SMART SYSTEM control makes the setup and operation of KNIGHT boilers easier through its large display, color-coded screens, soft keys and navigation dial used for transitioning from screen to screen quickly.

With over 100,000 units sold to date, the KNIGHT boiler line has continued to benefit from Lochinvar’s commitment to perpetual innovation with four model generations and a host of design, efficiency and installation enhancements.

---

KNIGHT PRODUCT TIMELINE

- **2005**
  - KBN Introduced Lochinvar’s Commercial Technology to the Residential Market

- **2007**
  - WBN Wall Mount Introduced to the Lineup

- **2008**
  - KNIGHT XL Residential and Light Commercial Boiler Introduced

- **2010**
  - 2nd Generation KBN/WBN Updated Smart System and New User Interface
  - WHN Wall Mount Fire Tube Introduced

- **2016**
  - KHN Introduced a Fire Tube in a Floor Standing Product with 3rd Generation Smart System & 10:1 Turndown

- **2017**
  - WHN with 10:1 Turndown 3rd Generation Smart System with Top and Bottom Water Connections
Lochinvar is proud to introduce the new, improved KNIGHT fire tube boiler—delivering ultimate ease of installation, unmatched operational reliability and serviceability.

Recent upgrades keep KNIGHT at the head of the class, allowing it to continue to lead the charge as the industry-leading high-efficiency residential boiler. With more adjustable parameters than any other competitor, KNIGHT is the most flexible residential boiler you can install.

Today, the new KNIGHT boiler family is available in 13 model options—six floor mounts and seven wall mounts. It also offers a broader range of heating capacity from 55,000 to 399,999 BTU/hr—while continuing to work at 95% AFUE efficiency.

### INDUSTRY-LEADING FEATURES

KNIGHT boilers now feature a universal vent connector, making installation easier than ever. It comes with many standard features that allow PVC, CPVC, polypropylene or stainless steel connections directly to the boiler.

We’ve added a variable speed ECM pump as standard equipment, helping to push day-to-day operational efficiency even further. We’ve also redesigned the trap height for the condensate pump to make installation a snap.

Every KNIGHT boiler comes with a built-in 110V convenience outlet. Use this handy standard feature to power your lighting or installation equipment—or for powering the condensate pump.

As in past generations, Lochinvar’s KNIGHT boiler continues to raise the bar for installation flexibility. With our latest product enhancements, we’ve pushed the KNIGHT boiler’s capabilities and value to levels the industry has never seen before.

### ECM PUMP STANDARD EQUIPMENT

ECM pump technology saves electricity & lowers operating costs. Lochinvar now includes this money saving technology as standard equipment on all WHB & KHB boilers. Using the Smart System to continuously match the target Delta T at all modulation rates this technology makes variable speed pump integration simple and easy. Push your savings further by taking advantage of local rebate programs for ECM variable speed pumps. Check with your local utilities company for details.
**KNIGHT FEATURES**

1. **UNIVERSAL VENT CONNECTOR**  
   Allows for easy installation of multiple vent materials.

2. **FIRE-TUBE HEAT EXCHANGER**  
   Low pressure drop saves on pump operation costs and provides installation flexibility, while stainless steel fights off corrosion.

3. **SMART SYSTEM USER INTERFACE**  
   A plain English, code free interface with multicolor diagnostic display.

4. **10:1 MODULATION TURNDOWN**  
   Saves money on fuel cost.

5. **ELECTRICAL OUTLET** (not shown on WHB)  
   Plug available for work light or condensate pump.

6. **LOCH-N-LINK® USB PROGRAMMING**  
   Allows for saving of parameters onto a USB drive for use at a different job site.

7. **INSTALLATION FLEXIBILITY**  
   Top and bottom water connection for the WHB. Top and left side utility connections for the KHB for easy retro-fitting, such as a cast iron efficiency upgrade.
BOILER CONTROL FROM ANYWHERE

The industry’s most advanced boiler control system now includes the CON·X·US® Remote Connect option and Loch-N-Link® USB drive programming feature. See next page for a complete list of SMART SYSTEM™ functions and features.

From wherever you are, the CON·X-US option lets you use any internet-capable device to link up with the SMART SYSTEM on an unlimited number of KNIGHT boilers. With CON·X-US, you’re always in touch and in control. Optional CON·X-US control board is sold separately.

» DO REGULAR CON·X-US CHECKS FOR ALL YOUR KNIGHT CUSTOMERS, AND LET THEM KNOW YOU’RE MONITORING THEIR BOILER’S PERFORMANCE.

» ADJUST SETPOINTS, DOMESTIC HOT WATER, RESET CURVES, PUMP DELAYS AND MORE, USING THE CON·X-US INTERACTIVE DISPLAY.

» STATUS ALERTS VIA TEXT OR E-MAIL LET YOU KNOW WHEN A KNIGHT BOILER NEEDS ATTENTION.

THE ULTIMATE IN BOILER CONTROL AND MONITORING

The backlit, user-friendly LCD display provides diagnostic information and system status in real words, not codes including:

SET-UP WIZARD
For fast and easy programming.

RAMP DELAY
Six steps of modulation to extend runtime and reduce cycling.

LOCH-N-LINK
Save parameters on a USB drive and take them with you for future use.

VACATION MODE
Tell your boiler when you are out of town to save energy.

OUTDOOR RESET WITH BOOST
Automatically change the set-point according to weather conditions.

MODULATION FACTOR
Fine tune boiler performance to be more or less aggressive depending on the application.

VARIABLE SPEED BOILER PUMP CONTROL
Keep the same Delta T at all firing rates to save electricity and increase performance.
THE BEST JUST GOT BETTER

New features include:

SET-UP WIZARD

VARIABLE SPEED ECM PUMP

UNIVERSAL VENT CONNECTOR WITH ANALYZER PORT

110V CONVENIENCE OUTLET

PARTS COMPATIBILITY BETWEEN FLOOR AND WALL MODELS

AUTOMATIC PARAMETER RESTORATION WHEN CONTROL IS REPLACED

SMART SYSTEM™ FUNCTIONS AND FEATURES

SMART SYSTEM™ FEATURES

» Smart System Digital Operating Control
  Multi-Color Graphic LCD Display w/Navigation Dial, Soft Keys and Loch-N-Link® USB programming

» Three Boiler Setpoint Temperature Inputs
  Plus Domestic Hot Water Prioritization

» Built-in Cascading Sequencer for up to 8 Boilers, with Cascade Redundancy
  Multiple Size Boiler Cascade
  Lead Lag
  Efficiency Optimization
  Front End Loading Capability

» Outdoor Reset Control with Outdoor Air Sensor
  Programmable for Three Reset Temperature Inputs

» Programmable System Efficiency Optimizers
  Space Heat Night Setback
  Domestic Hot Water Night Setback
  Anti-Cycling
  Outdoor Air Reset Curve
  Ramp Delay
  Modulation Factor Control
  Boost Temperature & Time

» Four Pump Control
  System Pump with Parameter for Continuous Operation
  Boiler Pump with Variable Speed Control
  Domestic Hot Water Pump
  Domestic Hot Water Recirculation

» Domestic Hot Water Prioritization
  DHW tank piped with priority in the boiler loop
  DHW tank piped as a zone in the system with the pumps controlled by the SMART SYSTEM
  DHW Modulation Limiting
  Separately Adjustable Space Heat/DHW Switching Times

» Building Management System Integration
  0-10 VDC Input to Control Modulation or Setpoint
  0-10 VDC Modulation Rate Output
  0-10 VDC Input to Enable/Disable Call for Heat

» Access to BMS Settings through Graphic LCD Display
  High-Voltage Terminal Strip
  120 VAC / 60 Hertz / 1 Phase Power Supply
  Three Sets of Pump Contacts

» Low-Voltage Terminal Strip
  Domestic Hot Water Recirculation Pump Start/Stop
  24 VAC Device Relay
  Configurable Proving Contacts
  Flow Switch Contacts
  Alarm on Any Failure Contacts
  Runtime Contacts
  DHW Thermostat Contacts
  3 Space Heat Thermostat Contacts
  System Sensor Contacts
  Domestic Hot Water Tank Sensor Contacts
  Outdoor Air Sensor Contacts
  Cascade Contacts
  0-10 VDC BMS External Control Contact
  0-10 VDC Boiler Rate Output Contacts
  0-10 VDC Variable Speed System Pump Signal Input
  0-10 VDC Signal to Control Variable Speed Boiler Pump Modbus Contacts

» Time Clock
  Data Logging
  Hours Running, Space Heating
  Hours Running, Domestic Hot Water
  Ignition Attempts
  Last 10 Lockouts

» Maintenance Reminder
  Custom Maintenance Reminder with Contractor Contact Information
  Installer Ability to De-activate Service Reminder

» Low-Water Flow Safety Control & Indication
  Password Security
  Customizable Freeze Protection Parameters

STANDARD FEATURES

» ENERGY STAR Most Efficient Product
  95% DOE AFUE Efficiency (WHB 55-285)
  Modulating2 Burner with up to 10:1 Turndown
  Direct Spark Ignition
  Low NOx Operation

» ASME Stainless Steel Heat Exchanger
  30 PSI ASME Relief Valve
  MNPT Top and Bottom Water Connections (WHB 55-285 only)

» Vertical & Horizontal Direct Vent
  PVC, CPVC, Polypropylene or SS Venting up to 100 feet

» Universal Vent Adapter
  Built-in Combustion Analyzer Port

» Smart System Control
  Condensate Trap

» ECM Variable Speed Boiler Circulating Pump
  110V Convenience Outlet

» High Altitude Models Available

» Other Features
  Automatic Reset High Limit
  Adjustable High Limit w/Manual Reset
  Boiler Circulating Pump
  Zero Clearances to Combustible Materials
  15-Year Limited Warranty (See Warranty for Details)
  5-Year Limited Parts Warranty

» Firing Codes
  M9 Standard Construction
  M7 California Code

OPTIONAL EQUIPMENT

CON·X·US® Remote Connectivity
Modbus Communication
BAConn MSTP
Flow Switch
Low-Water Cutoff w/Manual Reset & Test
Alarm Bell
Concentric Vent Kit
SMART SYSTEM™ PC Software
Condensate Neutralization Kit
BMS Gateway to LON or BACnet IP
Multi-Temperature Loop Control
Sidewall Vent Termination
Wireless Outdoor Sensor
LP Conversion Kit
### KNIGHT BOILER DIMENSIONS AND SPECIFICATIONS

#### WALL MOUNT

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Max</th>
<th>Min</th>
<th>AFUE%</th>
<th>Heating Capacity</th>
<th>Net MBH</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>Gas Conn.</th>
<th>Water Conn.</th>
<th>Air Inlet</th>
<th>Vent Size</th>
<th>Shipping Wt. (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KHB055N</td>
<td>55</td>
<td>50</td>
<td>95.0</td>
<td>51</td>
<td>44</td>
<td>3-1/2&quot;</td>
<td>3-1/4&quot;</td>
<td>3-3/4&quot;</td>
<td>6&quot;</td>
<td>6-1/2&quot;</td>
<td>2-1/2&quot;</td>
<td>5/8&quot;</td>
<td>8&quot;</td>
<td>4-1/2&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1-1/4&quot;</td>
<td>6&quot;</td>
<td>1/2&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KHB085N</td>
<td>85</td>
<td>80</td>
<td>95.0</td>
<td>79</td>
<td>69</td>
<td>3-1/2&quot;</td>
<td>3-1/4&quot;</td>
<td>3-3/4&quot;</td>
<td>6&quot;</td>
<td>6-1/2&quot;</td>
<td>2-1/2&quot;</td>
<td>5/8&quot;</td>
<td>8&quot;</td>
<td>4-1/2&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1-1/4&quot;</td>
<td>6&quot;</td>
<td>1/2&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KHB110N</td>
<td>110</td>
<td>105</td>
<td>95.0</td>
<td>102</td>
<td>90</td>
<td>2-3/4&quot;</td>
<td>2-3/4&quot;</td>
<td>3-3/4&quot;</td>
<td>6&quot;</td>
<td>6-1/2&quot;</td>
<td>2-1/2&quot;</td>
<td>5/8&quot;</td>
<td>8&quot;</td>
<td>4-1/2&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1-1/4&quot;</td>
<td>6&quot;</td>
<td>1/2&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KHB155N</td>
<td>155</td>
<td>150</td>
<td>95.0</td>
<td>144</td>
<td>125</td>
<td>2-3/4&quot;</td>
<td>2-3/4&quot;</td>
<td>3-3/4&quot;</td>
<td>6&quot;</td>
<td>6-1/2&quot;</td>
<td>2-1/2&quot;</td>
<td>5/8&quot;</td>
<td>8&quot;</td>
<td>4-1/2&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1-1/4&quot;</td>
<td>6&quot;</td>
<td>1/2&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KHB199N</td>
<td>199</td>
<td>194</td>
<td>95.0</td>
<td>185</td>
<td>161</td>
<td>3&quot;</td>
<td>3&quot;</td>
<td>3&quot;</td>
<td>6&quot;</td>
<td>6-1/2&quot;</td>
<td>2-1/2&quot;</td>
<td>5/8&quot;</td>
<td>8&quot;</td>
<td>4-1/2&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1-1/4&quot;</td>
<td>6&quot;</td>
<td>1/2&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KHB285N</td>
<td>285</td>
<td>280</td>
<td>95.0</td>
<td>264</td>
<td>229</td>
<td>3&quot;</td>
<td>3-1/2&quot;</td>
<td>3-1/4&quot;</td>
<td>3-3/4&quot;</td>
<td>6&quot;</td>
<td>6-1/2&quot;</td>
<td>2-1/2&quot;</td>
<td>5/8&quot;</td>
<td>8&quot;</td>
<td>4-1/2&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1-1/4&quot;</td>
<td>6&quot;</td>
<td>1/2&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

#### KEY FEATURES:
- **Thermal Efficiency%**
- **# Gross Output MBH**

---

**Information subject to change without notice. Change “N” to “L” for LP gas models.**

The Net AHRI Water Ratings shown are based on a piping and pickup allowance of 1.15. Lochinvar should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc. The ratings have been determined under the provisions governing forced draft burners.

**10:1 Turndown ratio and top and bottom water connections are not included on WHB399. WHB399 operates with a 5:1 turndown.**