HIGH EFFICIENCY CONDENSING BOILERS

KNIGHT®
FIRE TUBE BOILER





THE BEST KNIGHT EVER

FIFTEEN YEAR HEAT EXCHANGER
15/5
FIVE YEAR PARTS WARRANTY

95% AFUE Efficiency

SMART SYSTEM™

CONX US®
Capable

DESIGNED ★ ENGINEERED ★ ASSEMBLED
USA

Lochinvar®

THE LOCHINVAR DIFFERENCE



BROADEST LINE OF WATER HEATING SOLUTIONS IN THE INDUSTRY



INDUSTRY-LEADING TRAINING ON CAMPUS AND ONLINE AT LOCHINVARU.COM



A WORLD-CLASS RESEARCH & DEVELOPMENT DEPARTMENT THAT CONTINUOUSLY INTRODUCES NEW AND INNOVATIVE TECHNOLOGY



A COMMITMENT TO IN-DEPTH SERVICE BEFORE, DURING AND AFTER EVERY SALE

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.

A HISTORY OF INNOVATION

For over 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.



AN INDUSTRY LEADER IN THE MAKING, 1954.

DESIGNED ★ ENGINEERED ★ ASSEMBLED
USA

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 150,000 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



2010

2ND GENERATION KBN/WBN UPDATED SMART SYSTEM AND NEW USER INTERFACE



2016

KHN INTRODUCED A FIRE TUBE IN A FLOOR STANDING PRODUCT WITH 3RD GENERATION SMART SYSTEM & 10:1 TURNDOWN



2007

WBN WALL MOUNT INTRODUCED TO THE LINEUP



2010

WHN WALL MOUNT FIRE TUBE INTRODUCED



2017

WHN WITH 10:1 TURNDOWN 3RD GENERATION SMART SYSTEM WITH TOP AND BOTTOM WATER CONNECTIONS



THE BEST KNIGHT EVER

The Knight fire tube boiler is at the head of its class, allowing it 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.

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

KHB
KNIGHT FLOOR MOUNT

INDUSTRY-LEADING FEATURES

Knight boilers feature a universal vent connector, making installation easier than ever by allowing PVC, CPVC, polypropylene or stainless steel connections directly to the boiler.

The Knight also features a variable speed ECM pump as standard equipment, helping to push day-to-day operational efficiency further. The trap height for the condensate pump is ideally designed to make installation a snap.

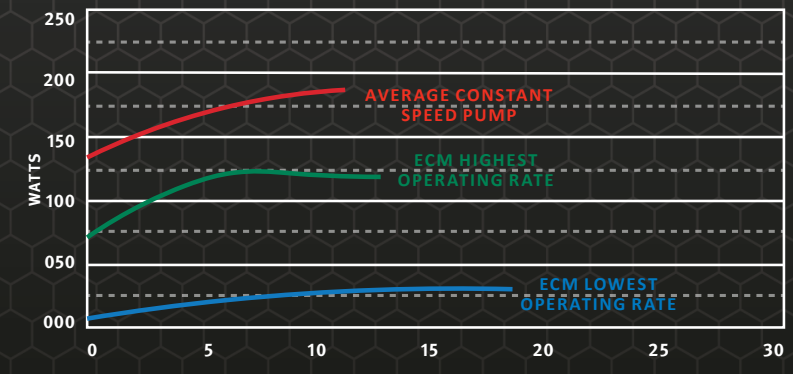
Every Knight boiler comes with a built-in 110V convenience outlet. Use this handy standard feature to power your lighting or installation equipment—or for powering the condensate pump.

Lochinvar's Knight boiler sets the standard for installation flexibility. With its expansive feature set, the Knight boiler's capabilities and value continue to exceed contractors' as well as homeowners' expectations.

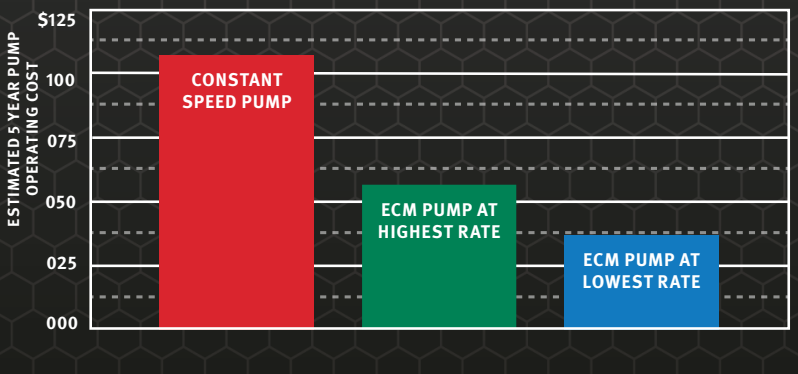
ECM PUMP STANDARD EQUIPMENT

ECM pump technology saves electricity & lowers operating costs. Lochinvar 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 or visit Lochinvar.com.

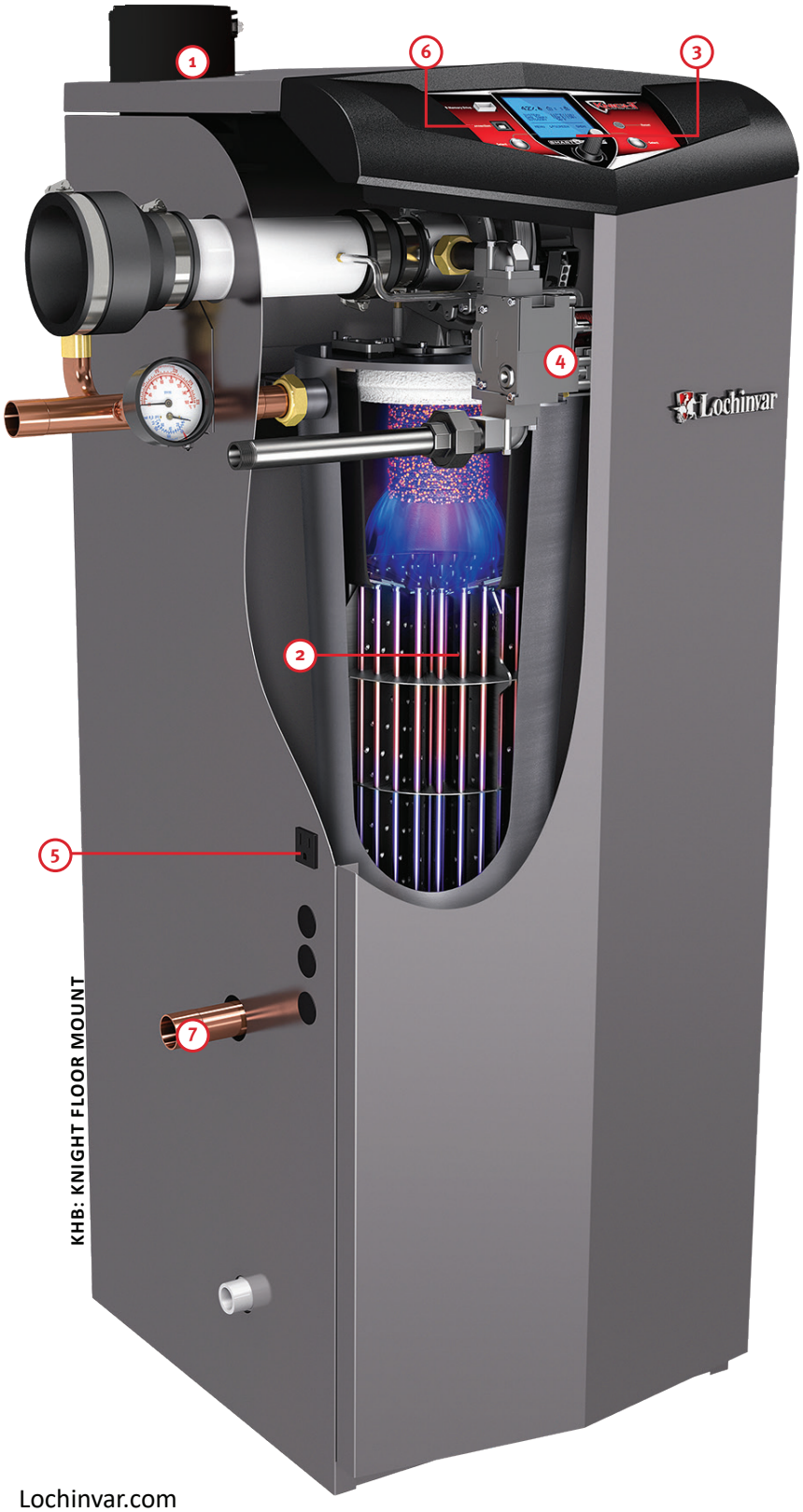
PUMP ENERGY USAGE



OPERATING COST



KNIGHT®
FIRE TUBE BOILER



KHB: KNIGHT FLOOR MOUNT



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. Left side utility connections for the KHB for easy retro-fitting, such as a cast iron efficiency upgrade.

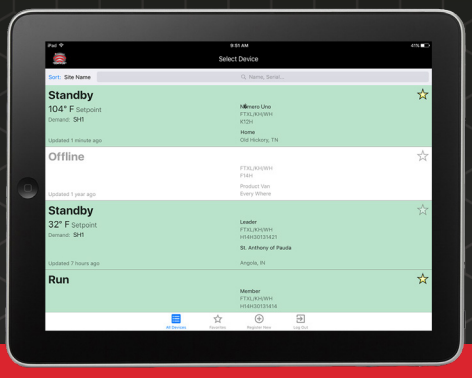


BOILER CONTROL FROM ANYWHERE

The industry's most advanced boiler control system 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.

CON·X·US®



» 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.

Download on the App Store

ANDROID APP ON Google play

SMART SYSTEM™

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 programing.

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.

LEADING THE CHARGE

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



WHB

KNIGHT WALL MOUNT

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**

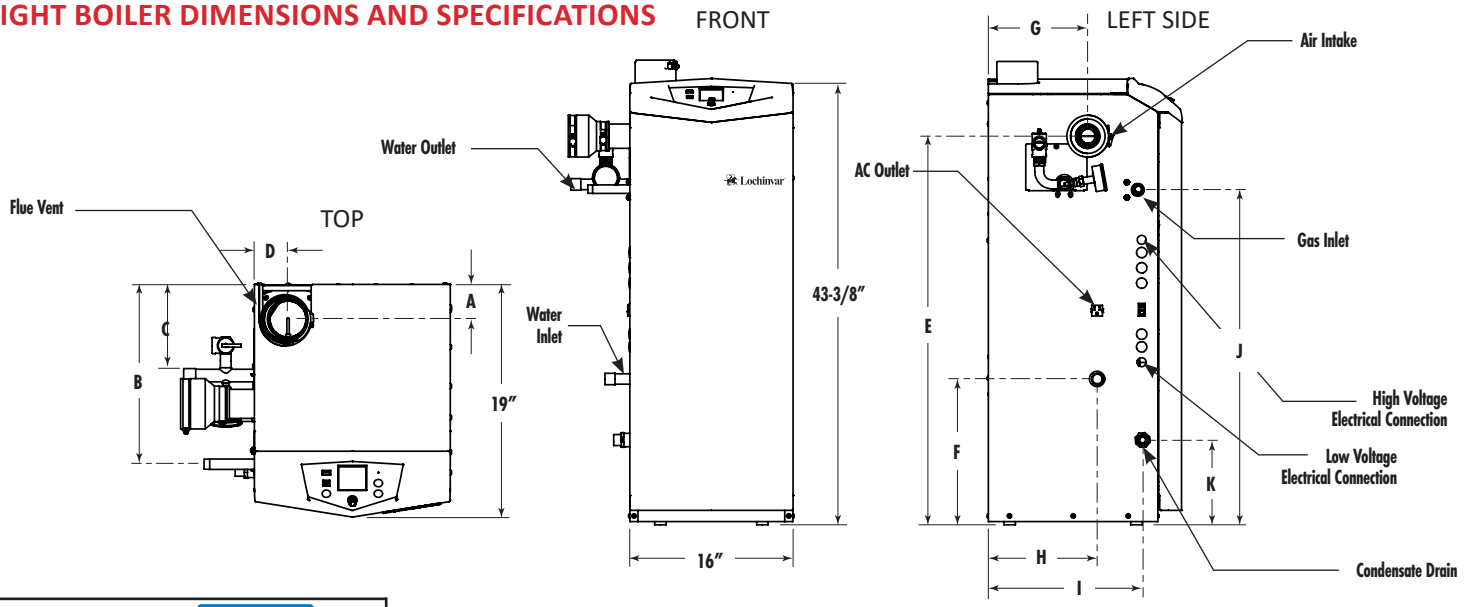
STANDARD FEATURES

- **ENERGY STAR® Certified**
- **95% DOE AFUE Efficiency (WHB 55-285)**
- **Modulating 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

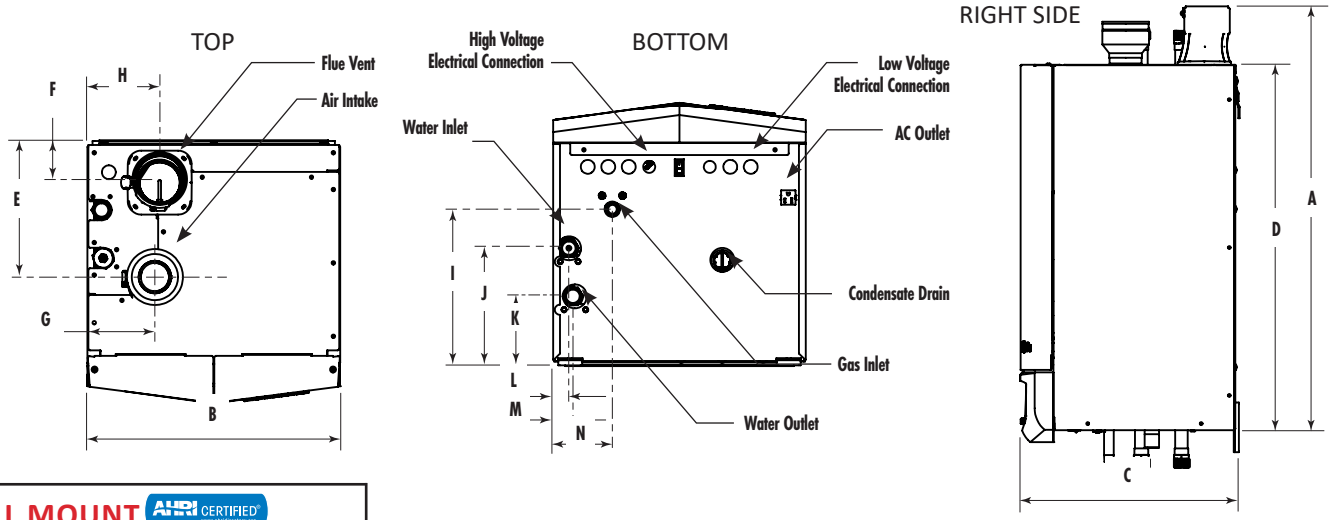
- Con·X·Us® Remote Connectivity
- Modbus Communication
- BACnet MSTP
- Flow Switch
- Low-Water Cutoff w/Manual Reset & Test
- Alarm Bell
- Concentric Vent Kit
- Smart System™ PC Software
- Condensate Neutralization Kit
- BMS Gateway to LON or BACnet IP
- Sidewall Vent Termination
- Wireless Outdoor Sensor
- LP Conversion Kit

KNIGHT BOILER DIMENSIONS AND SPECIFICATIONS



FLOOR MOUNT

Model Number	Input MBH Min	Input MBH Max	Heating Capacity MBH	Net AHRI Rating Water,MBH	AFUE,%	A	B	C	D	E	F	G	H	I	J	K	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
KHB055N	8.3	55	51	44	95.0	3 1/2	13 1/4	6	2 3/4	37 2/3	13 1/2	8 1/3	10 1/2	15	32 1/2	8 1/3	1/2	1	2	2	160
KHB085N	8.5	85	79	69	95.0	3 1/2	13 1/4	6	2 3/4	37 2/3	13 1/2	8 1/3	10 1/2	15	32 1/2	8 1/3	1/2	1	2	2	165
KHB110N	11	110	102	89	95.0	2 3/4	14 3/4	7 1/2	2 3/4	38	14 1/3	9 3/4	10 1/2	15	33	8 1/3	1/2	1	3	3	170
KHB155N	15.5	155	143	124	95.0	2 3/4	14 3/4	7 1/2	2 1/2	38	14 1/3	9 3/4	10 1/2	15	33	8 1/3	1/2	1	3	3	175
KHB199N	19.9	199	184	160	95.0	3	15 1/2	7 1/2	2 1/2	38 1/3	14 1/3	10 1/2	11 1/2	15	33	8 1/3	1/2	1 1/4	3	3	195
KHB285N	28.5	285	264	230	95.0	3	15 1/2	7 1/2	2 1/2	38 1/3	14 1/3	10 1/2	11 1/2	15	33	8 1/3	1/2	1 1/4	3	3	205



WALL MOUNT

Model Number	Input MBH Min	Input MBH Max	*Output MBH	Net AHRI Rating, Water, MBH	AFUE,%	Combustion Efficiency, %	Thermal Efficiency, %	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Ship Wt. (lbs.)
WHB055N	8.3	55	51	44	95.0	-	-	40"	18-3/4"	16"	31-1/8"	8-1/2"	3-3/4"	4-1/2"	6-1/2"	7-1/4"	8-7/8"	3-1/2"	1-1/2"	1-1/2"	6"	1/2"	1"	2"	2"	139
WHB085N	8.5	85	79	69	95.0	-	-	39-3/4"	18-3/4"	16"	31-1/8"	8-1/2"	3-3/4"	4-1/2"	6-1/2"	7-1/4"	8-7/8"	3-1/2"	1-1/2"	1-1/2"	6"	1/2"	1"	2"	2"	142
WHB110N	11	110	102	89	95.0	-	-	41-1/4"	18-3/4"	19"	31-1/8"	10"	2-3/4"	5"	5-1/4"	11-1/2"	8-1/2"	5"	1"	1"	4-1/2"	1/2"	1"	3"	3"	159
WHB155N	15.5	155	144	125	95.0	-	-	41-1/4"	18-3/4"	19-1/8"	31-1/8"	10"	2-3/4"	5"	5-1/4"	11-1/2"	8-1/2"	5"	1"	1"	4-1/2"	1/2"	1"	3"	3"	166
WHB199N	19.9	199	184	160	95.0	-	-	41-1/4"	18-3/4"	19-1/8"	31-1/8"	10-1/2"	3"	5-1/4"	6"	11"	9-1/2"	6-1/4"	1-1/2"	1-1/2"	4-1/2"	1/2"	1-1/4"	3"	3"	175
WHB285N	28.5	285	264	230	95.0	-	-	41-3/4"	18-3/4"	21-1/8"	31-1/8"	15"	3"	3-3/4"	5-1/4"	12-1/4"	11"	6-1/4"	1-1/2"	1-1/2"	6-1/2"	1/2"	1-1/4"	3"	3"	184
WHB399N	39.9	399	377	328	-	96.0	94.4	43-5/8"	25-1/4"	21-7/8"	34-3/8"	3-1/8"	4-1/4"	23"	3-7/8"	8-3/4"	12-1/2"	9-1/4"	2"	2"	23"	3/4"	1-1/2"	4"	4"	213

Information subject to change without notice. Dimensions shown are approximate and should not be used for construction purposes. *"Output" is "Heating Capacity for units with inputs <300 MBH and "Gross Output" for units ≥300 MBH. 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.

For technical information call 800-722-2101. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.

Lochinvar®

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