CONDESING RESIDENTIAL GAS BOILERS

95% AFUE Efficiency

CONTROL WITH ADVANCED USER FEATURES

MODELS FROM 80,000 TO 285,000 BTU/HR

5:1 FIRING RATE MODULATION

LESS THAN 20 ppm NOx

DIRECT VENT FLEXIBILITY TO 100 FEET

UP TO 98% EFFICIENCY IN LOW TEMP APPLICATIONS

Lochinvar® HIGH EFFICIENCY BOILERS & WATER HEATERS

knightheatingboiler.com
KNIGHT is recognized for its reliable, proven performance and high quality standards. Its award winning design assures contractors and home owners peace of mind and long term savings in operating costs.

Lochinvar has raised the KNIGHT standard to even greater heights. The SMART SYSTEM™ control with color display gives installers and maintenance personnel a greater level of control than ever before. It’s easy to access all the information they need to setup, troubleshoot and monitor all boiler functions. Additionally, two cascading options allow the installer to fine-tune sequencing of multiple boiler installations.

More than ever, KNIGHT is the best choice for traditional hydronic space heating, radiant floor heating and indirect domestic hot water applications.

**FLOOR STANDING MODELS**

The KNIGHT Floor-Standing lineup features 5 small footprint models from 80,000 to 285,000 Btu/hr.

**WALL-MOUNTED FIRE TUBE MODELS AVAILABLE**

7 Inputs from 55,000 to 399,999 Btu/hr. See Knight Wall Mount Literature (WHN) for more details.

KNIGHT XL COMMERCIAL

Need more BTU’s? KNIGHT XL Commercial Boilers are available in 5 sizes from 399,999 to 800,000 Btu/hr. See KNIGHT XL literature for more details.
The SMART SYSTEM™ is the most advanced integrated boiler control on the market today.

**LARGER LCD SCREEN**
Displays more information.

**SOFT KEYS**
For simple programming.

**NAVIGATION DIAL**
For fast transitions from screen to screen and easy adjustment of settings.

**USB PORT**
USB port permits connection to a laptop computer. SMART SYSTEM PC software may be used to troubleshoot and program KNIGHT® functions, set date and time, monitor historical data, including faults, trends and energy consumption.

**AT-A-GLANCE COLOR-CODING**

- **BLUE SCREEN**
  Normal system operation.

- **YELLOW SCREEN**
  Maintenance due - shows the installer's name and number on the display.

- **RED SCREEN**
  Lockout mode - shows active fault and installer's name and number on the display.

**SELECTABLE CASCADE OPTIONS**

When multiple KNIGHT boilers are installed together, the SMART SYSTEM built-in sequencer can be set for “Lead-Lag” cascade or “Efficiency Optimized” cascade operation.

**LEAD-LAG CASCADE**

The “lead” boiler modulates with demand to capacity. As demand increases, additional boilers fire and modulate to capacity. This continues, with additional boilers firing and modulating to capacity until all units are operating. Every 24 hours, the SMART SYSTEM automatically shifts the lead boiler role to the next in the sequence, distributing lead-lag runtimes equally.

**EFFICIENCY OPTIMIZED CASCADE**

This feature optimizes the modulation capabilities of the Boiler Plant while evenly distributing run time across all cascaded boilers. Every 24 hours the SMART SYSTEM automatically shifts the 1st boiler on role to the next in the sequence, distributing run time equally.

*SMART SYSTEM Cascade option allows 2 - 8 boilers to be sequenced.*
Dial in System Performance

**NEW!**
**COMPATIBILITY WITH COPPER FIN II NON-CONDENSING BOILER**
Allows you to create a front end loading system.

**NEW!**
**MULTIPLE SIZED BOILER CASCADE CONTROL**
KNIGHTS of one or more sizes can be combined into a single cascade to maximize turndown and meet minimum demands.

* **INTERNAL CASCADING SEQUENCER WITH MULTIPLE PROGRAMMABLE SYSTEM EFFICIENCY OPTIMIZERS**
Fine-tune installations using Lead-Lag or Efficiency Optimization Cascade features.

**NEW!**
**FLEXIBLE OPTIONS FOR DIRECT-VENTING UP TO 100 FEET!**
Placement of units within a building will never be a problem with KNIGHT. It permits up to 100 feet of air intake and 100 feet of exhaust vent with PVC, CPVC, polypropylene or stainless steel pipe.

**NEW!**
**OPTIONAL MODBUS CAPABILITY**
Allows boiler communication through Modbus protocol. Simplifies BMS/boiler interface for status monitoring.

**OPTIONAL KIT ALLOWS FOR AN ATTRACTIVE SIDEWALL TERMINATION WHEN USING PVC, CPVC OR POLYPROPYLENE VENT MATERIAL.**

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**NEW!**
**DOMESTIC HOT WATER PRIORITIZATION W/PUMP CONTROL**
On DHW call, SMART SYSTEM overrides the outdoor reset and starts the DHW pump to the indirect water heater alternating to meet both heating and hot water demands.

**NEW!**
**LOW-WATER FLOW INDICATOR**
Uses temperature differential to protect against low flow in heat exchanger by reducing modulation or forcing boiler shutdown.

**NEW!**
**DIAMOND LEVEL SECURITY**
Allows only qualified personnel to access parameters.

**NEW!**
**PRODUCT SERVICE INDICATOR**
Program reminders for cycle count, operation hours or last service. Installer’s name and number may be displayed.

---

**5 FLEXIBLE OPTIONS FOR DIRECT-VENTING UP TO 100 FEET!**

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State-of-the-Art Modulating Combustion System

Advanced Negative Regulation Technology
KNIGHT safely and reliably operates with supply gas pressures as low as 4 inches water column. Plus “Neg/Reg” technology automatically adjusts gas pressure to ensure the correct volume of fuel and air entering the burner.

Direct-Spark Ignition
With each call for heat, two electrodes ignite the fuel/air mixture. A third electrode then senses for flame. The SMART SYSTEM will generate a soft lockout and display a fault if ignition does not occur.

Fully Modulating Burner with 5:1 Turndown
The SMART SYSTEM allows fully modulating combustion with 5:1 turndown. The burner can fire as low as 20% of maximum input and modulate the firing rate up to 100% as demand increases. A woven stainless steel mesh enclosed burner tube fires in a 360° pattern along the entire length of the primary heat exchanger.

Two-in-One Stainless Steel Heat Exchanger
A primary heat exchanger combined with a secondary heat exchanger captures flue gas heat and condenses to utilize available latent energy. The stainless steel, pH-tolerant design features a weld-sealed assembly with no O-rings or gaskets and does not require special glycol. ASME Section IV approved and stamped.

Field Connection Versatility
User-friendly terminal strip allows for 44 low-voltage field connections. Four-line voltage connections supply power to the unit and up to three pumps operated by the SMART SYSTEM.

Team KNIGHT with SQUIRE for low-cost domestic hot water!

KNIGHT’s Domestic Hot Water Prioritization feature means you can easily install it with Lochinvar’s SQUIRE® indirect water heater, available in 30, 40, 50, 65, 80 and 119 gallons. This combination will give homeowners high-efficiency space heating from KNIGHT, and abundant domestic hot water from SQUIRE. With a stainless steel tank and heat exchanger, SQUIRE provides more hot water and lower water heating costs than standard gas or electric water heaters.
### Knight Heating Boiler

#### Dimensions and Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Input Min. MBH</th>
<th>Input Max. MBH</th>
<th>A/FUE</th>
<th>Heating Capacity MBH</th>
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Notes: Indoor installation only. All information subject to change. Change “N” to “L” for LP gas models.

### SMART SYSTEM™ Features

- **High-Voltage Terminal Strip**
- **Low Voltage Terminal Strip**
- **Modulating Burner with 5:1 Turndown**
- **Direct-Spark Ignition**
- **Low-Nox Operation**
- **Field Convertible from Natural to LP Gas**
- **ASME Stainless Steel Heat Exchanger**
- **30 psi ASME Relief Valve**
- **Vertical & Horizontal Direct-Vent**
- **PVC, CPVC, Polypropylene or SS Venting up to 100 feet**
- **Smart System Control**
- **Condensate Trap**
- **Other Features**
  - Automatic Reset High Limit
  - Adjustable High Limit w/Manual Reset
  - Boiler Circulating Pump
  - Adjustable Leveling Legs
  - Zero Clearances to Combustible Materials
  - 12-Year Limited Warranty (See Warranty for Details)
  - 2-Year Parts Warranty

### Standard Features

- **ENERGY STAR Most Efficient Recognition**
- **95% DOE AFUE Efficiency**
- **Condensate Neutralization Kit**
- **Multi Temperature Loop Control**
- **Condensate Neutralization Kit**
- **Multi Temperature Loop Control**
- **Low-Water Cutoff w/Manual Reset & Test**
- **Alarm Bell**
- **Concentric Vent Kit**
- **SMART SYSTEM PC Software**
- **Stack Frame**
- **BMS Gateway to LON or BacNet**
- **Sidewall Vent Termination**

### Optional Equipment

- **Modbus Communication**
- **Multi-Color Graphic LCD Display**
- **Modbus Communication**
- **Battery Backup**
- **Secondary Control**
- **Multi-Color Graphic LCD Display**
- **Modbus Communication**
- **Battery Backup**
- **Secondary Control**

### Firing Codes

- **M9** Standard Construction
- **M7** California Code

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<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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**Net ratings based on piping and pick-up allowances of 1.15.**