CONDENSING RESIDENTIAL GAS BOILERS

SMART SYSTEM
CONTROL WITH ALL NEW, ADVANCED USER FEATURES

5 FLOOR-STANDING AND 5 WALL-MOUNT MODELS FROM 50,000 TO 285,000 BTU/HR

FIRING RATE MODULATION TO 5:1

LESS THAN 20 ppm NOx

DIRECT VENT FLEXIBILITY TO 100 FEET

UP TO 98% EFFICIENCY IN LOW TEMP APPLICATIONS

UP TO 96% AFUE EFFICIENCY

Lochinvar® High Efficiency Water Heaters, Boilers and Pool Heaters

knighthouseatingboiler.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.

Now, Lochinvar has raised the KNIGHT standard to even greater heights. The dramatically enhanced SMART SYSTEM™ control with color display gives installers and maintenance personnel a greater level of control than ever before. It's easier to access all the information they need to setup, troubleshoot and monitor all boiler functions. Additionally, two new 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 domestic hot water applications.*

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**WALL-MOUNT MODELS**

5 space-saving KNIGHT Wall-Mount Boilers are available from 50,000 to 210,000 Btu/hr.

**FLOOR STANDING MODELS**

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

**KNIGHT XL COMMERCIAL**

Need more BTU’s? KNIGHT XL Commercial Boilers are available in 5 sizes from 399,000 to 800,000 Btu/hr. See KNIGHT XL literature for more details.

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All KNIGHT Boilers meet or exceed the most stringent requirements, with less than 20 ppm NOx.

The KNIGHT Boiler has earned the ENERGY STAR, signifying that it has met strict energy-efficiency guidelines set by the EPA and U.S. Department of Energy.
**Refined Design Puts More Control and Information at Your Fingertips**

The new 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.

- **New 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.
Factory Supplied and Shipped with Every Model

5 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 3" PVC, CPVC or stainless steel pipe. Three Wall-Mounted KNIGHT models (WBN 51 -106) also permit intake and vent runs up to 40 feet using 2" pipe
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.
**Smart System™ Features**

- SMART SYSTEM Digital Operating Control
- Multi-Color Graphic LCD Display with Navigation Dial and Soft Keys
- Three Setpoint Temperature Inputs
- Built-in Cascading Sequencer for up to 8 Boilers
- Programmable System Efficiency Optimizers
- Night Setback w/Override Function
- Outdoor Air Reset Curve
- Ramp Delay
- Boost Temperature & Time
- Three Pump Control
  - System Pump with Parameter for Continuous Operation
  - Boiler Pump with Variable Speed Pump Control*
  - Domestic Hot Water Pump
- 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 SH/DHW Switching Times*
- Building Management System Integration
  - 0-10VDC Input to Control Modulation or Set Point
  - 0-10VDC Modulation Rate Output
  - 0-10VDC Input Signal from Variable Speed System Pump*
  - 0-10VDC Input to Enable/Disable call for heat
*Exclusive feature, available only from Lochinvar

- High-Voltage Terminal Strip
  - 120 VAC / 60 Hz / 1 Phase Power Supply
  - Three Sets of Pump Contacts
- Low Voltage Terminal Strip
  - 24 VAC Device Relay
  - Proving Switch Contacts
  - Flow Switch Contacts
  - Alarm on Any Failure Contacts
  - Runtime Contacts
  - DHW Thermostat Contacts
  - 3 Space Heat Thermostat Contacts
  - System Sensor Contacts
  - DHW Tank Sensor Contacts
  - Outdoor Air Sensor Contacts
  - Cascade Contacts
  - 0-10VDC BMS External Control Contact
  - 0-10VDC Boiler Rate Output Contacts
  - 0-10VDC Variable Speed System Pump Signal Input
  - 0-10VDC 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
- Access to BMS Settings through Graphic LCD Display
- Maintenance Reminder
  - Custom Maintenance Reminder with Contractor Info
  - Installer Ability to De-activate Service Reminder
- Low-Water Flow Safety Control & Indication
- Dual Level Water Security
- Customizable Freeze Protection Parameters

**Standard Features**

- Energy Star™ Qualified
- Up to 96% DOE AFUE Efficiency
- Modulating Burner with 5:1 Turndown
- Direct-Spark Ignition
- Low-Nox Operation
- Field Convertible from Natural to LP Gas
- ASME Stainless Steel Heat Exchanger
- 3 psi ASME Relief Valve
- Vertical & Horizontal Direct-Vent
- PVC, CPVC or SS Venting up to 100 feet
- Factory Supplied Sidewall Vent Termination
- Smart System Control
- Condensate Trap
- Other Features
  - Automatic Reset High Limit
  - Adjustable High Limit w/Manual Reset
  - Boiler Circulating Pump
  - Adjustable Leveling Legs (KB Models only)
  - Wall-Mount Bracket (WB Models only)
  - Zero Clearances to Combustible Materials
- 12-Year Limited Warranty (See Warranty for Details)

**Optional Equipment**

- Modbus Communication
- Condensate Neutralization Kit
- Flow Switch
- Low-Water Cutoff w/Manual Reset & Test
- Alarm Bell
- Concentric Vent Kit
- SMART SYSTEM PC Software
- Stack Frame

**Firing Codes**

- M9 Standard Construction
- M7 California Code

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**Notes:** Indoor installation only. All information subject to change. Change “N” to “L” for LP gas models.