

HIGH EFFICIENCY COMMERCIAL BOILERS

# COPPER-FIN II<sup>®</sup>



**SMART SYSTEM<sup>™</sup>**

ADVANCED OPERATING CONTROL  
FEATURING A BUILT-IN CASCADING SEQUENCER

9 MODELS - 400,000 - 2,070,000 BTU/HR

PROPORTIONAL FIRING UP TO 4:1

LESS THAN 20 ppm NOx

VENT FLEXIBILITY TO 100 FEET



**85%**  
**THERMAL EFFICIENCY**



**Lochinvar<sup>®</sup>**  
High Efficiency Water Heaters, Boilers and Pool Heaters

[Lochinvar.com](http://Lochinvar.com)

# COPPER-FIN II®

## THE FOUNDATION OF LOCHINVAR BECOMES STRONGER

Copper-finned tube, non-condensing appliances are the foundation of Lochinvar's success. In 1993, Lochinvar introduced the Copper-Fin II, the first horizontal chassis, copper-finned tube boiler to operate with fan-assisted combustion. Now, the Copper-fin II is even better. Along with high thermal efficiency, gasketless heat exchangers and multiple venting options we have added Lochinvar's exclusive SMART SYSTEM™ control.

Nine models from 399,999 to 2,070,000 Btu/hr input provide you with exceptional products with a long list of new features in addition to the established features which redefined the industry. The Copper-fin II was the first proportional fired, fan-assisted boiler on the market. Every model features a small footprint for easy passage through a 36" door, low NOx – third party tested to less than 20 PPM, Stack Frames that can put twice the Btu/hr input in the same space and vent diameters up to 8" smaller than conventional atmospheric boilers.

### THERMAL EFFICIENCY

Copper-Fin II boilers offer a remarkably high 85% thermal efficiency. This means that 85¢ out of every fuel dollar goes into heating the water, dramatically reducing the operating cost of the equipment. Copper-Fin II achieves this efficiency through the combination of an advanced fan assisted combustion system and gasketless heat exchanger. The heat energy from the combustion process is transferred to the water as it passes through the solid copper finned tube heat exchanger. The sealed combustion design of the Copper-Fin II eliminates external heat losses, this means that the energy dollars heat the water, not the mechanical room.

### GASKETLESS HEAT EXCHANGER

In 1989, Lochinvar was the first water heater manufacturer to offer gasketless cast iron & copper-finned tube heat exchangers. Our unique gasketless design enhances reliability by eliminating o-rings and gaskets found on other brands. The heat exchanger features glass lined headers and copper-finned tubes with extruded integral fins spaced 7-fins per inch for exceptional heat transfer. The heat exchanger is built to ASME construction standards for 160 psi working pressure and is backed by a ten year limited warranty.



### SPACE SAVING, SERVICE FRIENDLY DESIGN

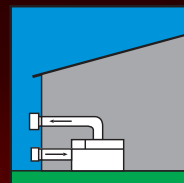
Our enhanced Copper-fin II models offer the same reliable operation in a new service friendly design. The gas inlet, internal controls and Building Management connections have been repositioned to the front of the appliance for easier service and simpler installation. The built-in air filter reduces maintenance and improves performance with a field convertible option to install the air intake on the rear or the right side of the boiler. In addition, Lochinvar was the first manufacturer to offer factory welded Stack Frames that allow you to put two boilers in the space for one.

**STACK  
FRAME**

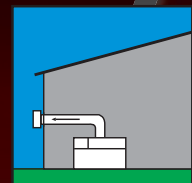
### MULTIPLE VENTING OPTIONS

The Copper-fin II offers **eight venting options** to meet the most challenging installation requirements. The Copper-fin II can vent vertically in Category I with double wall "B" vent or horizontally in Category IV with AL29-4C stainless steel vent material. Vent termination can be Rooftop or Sidewall with combustion air drawn naturally from the equipment room or via dedicated air intake piping. And if floor space is limited, the Copper-fin II boiler can be installed outdoors with an optional Outdoor Vent Cap.

Aire-Lock® Direct Vent



Sidewall



# High Efficiency Commercial Boilers



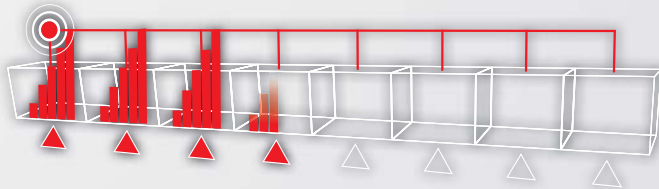
## REFINED DESIGN PUTS MORE CONTROL AND INFORMATION AT YOUR FINGERTIPS

The most exciting addition to the Copper-Fin II is the SMART SYSTEM™ control. The SMART SYSTEM is an advanced, state of the art integrated operating control. We introduced the SMART SYSTEM control in 2005 and it has delivered proven operation in thousands of demanding commercial applications. The control provides the installer, owners and operators with precise temperature control and diagnostic information.

### Advanced features include:

- 2-LINE, 16 CHARACTER LCD DISPLAY OF SETUP, SYSTEM STATUS AND DIAGNOSTIC DATA IN WORDS, NOT CODES
- BUILT-IN CASCADE SEQUENCER CONTROLLING UP TO 8 BOILERS
- FRONT END LOADING CAPABILITY WITH CREST OR KNIGHT BOILERS
- OUTDOOR RESET ADJUSTS SETPOINT BASED ON RESET CURVE
- DOMESTIC HOT WATER PRIORITIZATION ALLOWS THE BOILER TO PROVIDE SPACE HEATING AND PRODUCE DOMESTIC HOT WATER ALL IN ONE SYSTEM
- 0-10 VDC BMS INPUT TO CONTROL BOILER OPERATION
- MODBUS PROTOCOL - OPTIONAL

### CASCADE OPTIONS



The “lead unit” 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.

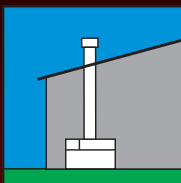


### PROPORTIONAL FIRING

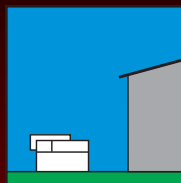
Proportional firing divides a single manifold of multiple burners into smaller, independent stages.

With up to four stages of individual operation, the Smart System control can reduce the firing rate down to approximately 25% Btu/hr input. This simple but effective design matches the boiler’s firing capacity to the constantly changing system demand. Full Fire or On/Off combustion systems often fire the entire gas train in short, inefficient bursts. Stage firing delivers the Btu’s required in smoother and longer burn cycles which will improve operation and reduce component fatigue.

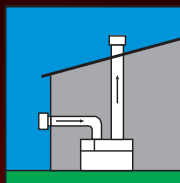
Conventional



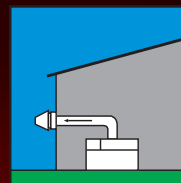
Outdoor



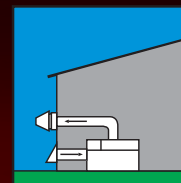
Direct Aire Vertical w-sidewall Inlet



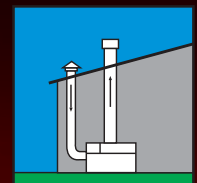
Powered Sidewall



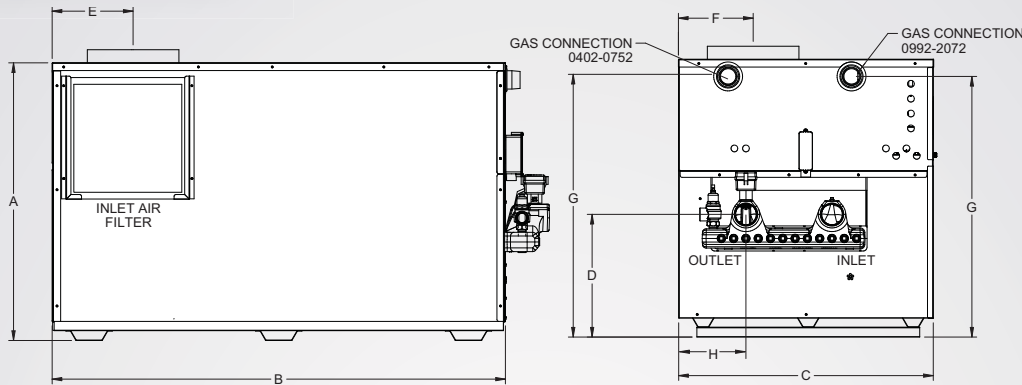
Power DirectAire Horizontal



DirectAire Vertical



# COPPER-FIN II<sup>®</sup> Commercial Gas Boiler Dimensions & Specifications



Copper-Fin II Heating Boiler					Dimensions & Specifications											
Model Number	Input MBH	Thermal Efficiency	Output MBH	Net I=B=R MBH	A	B	C	D	E	F	G	H	Vent Size	Air Inlet	Gas Conn	Shipping Weight
CHN0402	399	85%	339	295	31-1/2"	37-3/4"	22-1/4"	12-1/2"	7"	7"	29"	6-1/2"	6"	6"	1-1/4"	378
CHN0502	500	85%	425	370	31-1/2"	45-1/2"	22-1/4"	12-1/2"	7"	7"	29"	6-1/2"	6"	6"	1-1/4"	414
CHN0652	650	85%	553	481	31-1/2"	56-3/4"	22-1/4"	12-1/2"	8-1/2"	8-1/4"	29"	6-1/2"	8"	8"	1-1/4"	500
CHN0752	750	85%	638	555	31-1/2"	64"	22-1/4"	12-1/2"	8-1/2"	8-1/4"	29"	6-1/2"	8"	8"	1-1/4"	543
CHN0992	990	85%	842	732	36"	48-1/4"	33-1/2"	15-3/4"	8-1/2"	8-1/2"	33-3/4"	8-3/4"	10"	10"	2"	773
CHN1262	1,260	85%	1,071	931	36"	58-1/2"	33-1/2"	15-3/4"	10-1/2"	9-1/2"	33-3/4"	8-3/4"	12"	12"	2"	863
CHN1442	1,440	85%	1,224	1,064	36"	68-3/4"	33-1/2"	15-3/4"	10-1/2"	10-1/2"	33-3/4"	8-3/4"	12"	12"	2"	965
CHN1802	1,800	85%	1,530	1,330	36"	82-1/4"	33-1/2"	15-3/4"	11"	11"	33-3/4"	8-3/4"	14"	12"	2"	1,100
CHN2072	2,070	85%	1,760	1,530	36"	92-1/2"	33-1/2"	15-3/4"	11"	11"	33-3/4"	8-3/4"	14"	12"	2"	1,219

Notes: Change 'N' to 'L' for LP gas models. No deration on LP models. Water connections for models CH 0402-0752 are 2" NPT on 6-1/2" centers. Header increases "B" dimension 3-1/2" for models CH 0402-0752 and 6-1/4" for models CH 0992-2072. Water connections for models CH 0992-2072 are 2-1/2" NPT on 11-1/4" centers.

## STANDARD FEATURES

- 85% Thermal Efficiency (AHRI Certified)
- Proportional Firing up to 4:1 Turndown
  - Hot Surface Ignition
  - Low NOx Operation
  - Sealed Combustion
  - Low Gas Pressure Operation
- Vertical & Horizontal Venting
  - Category I Venting
    - Double Wall "B" Vent Material
  - Category IV Venting
    - AL29-4C Stainless Steel Vent Material
- ASME Copper Finned Tube Heat Exchanger
  - ASME Certified, "H" Stamped
  - Gasketless design
  - 160 psi working pressure
  - On/Off Switch
  - Combustible Floor Rated (CH 0992 - 2072)
  - Adjustable High Limit w/ Manual Reset
  - Flow Switch
  - Low Air Pressure Switch
  - Inlet & Outlet Temperature Sensors
  - Easy Access Terminal Strips
  - Downstream Test Cocks
  - 50 psi ASME Pressure Relief Valve
  - Temperature & Pressure Gauge
  - 1 Year Warranty on Parts (See Warranty for Details)
  - 10 Year Limited Warranty (See Warranty for Details)

## OPTIONAL EQUIPMENT

- Alarm
- High & Low Gas Pressure Switches w/ Manual Reset
- Cupro-Nickel Heat Exchanger
- Low Water Cut Off, Probe Type w/ Manual Reset & Test
- Modbus Communications
- BMS Gateway - BACnet or LonWorks
- Combustible Floor Kit (CH 0402-0752)
- Stack Frame
- Low Temperature Protection Valve

## SMART SYSTEM™ FEATURES

- SMART SYSTEM™ Operating Control
  - 2 Line/16 Character LCD Display
  - Built in Cascading Sequencer for up to 8 boilers
  - Front End Loading Capability with Crest or Knight Boilers
  - Building Management System Integration with 0-10 VDC Input
  - Outdoor Reset Control with Outdoor Air Sensor
  - Password Security
  - Domestic Hot Water Prioritization
  - Low Water Flow Control & Indication
  - Inlet & Outlet Temperature Readout
  - Freeze Protection
  - Service Reminder
  - Time Clock
  - 0-10V DC Rate Output
  - Condensing Protection
  - 0-10V System Pump Speed Input
- Data Logging
  - Hours Running, Space Heating
  - Hours Running, Domestic Hot Water
  - Ignition Attempts
  - Last 10 Lockouts
- Programmable System Efficiency Optimizers
  - Night Setback
  - Anti-Cycling
  - Outdoor Air Reset Curve
  - Boost Temperature & Time

## FIRING CODES

- M7 Firing Code - California Code
- M9 Firing Code - Hot Surface Ignition with Electronic Supervision
- M13 Firing Code - CSD1 / Factory Mutual / GE Gap

## CERTIFICATIONS

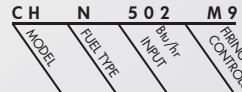
ANSI Z21.13/CSA 4.9 certified  
 South Coast Air Quality Management District  
 Texas Commission on Environmental Quality

## Three Pump Control

- System Pump
- Boiler Pump
- Domestic Hot Water Pump
- High Voltage Terminal Strip
  - 120 VAC / 60 Hertz / 1 Phase Power Supply
  - Pump Contacts with Pump Relay
- Low Voltage Terminal Strip
  - 24 VAC Auxiliary Device Relay Output - Louvers
  - Auxiliary Proving Switch Contacts - Louvers
  - 3-way Valve Contacts for Low Temperature Protection
  - Alarm on Any Failure Contacts
  - 0-10V System Pump Speed Contacts
  - Runtime Contacts
  - DHW Thermostat Contacts
  - DHW Tank Sensor Contacts
  - Unit Enable/Disable Contacts
  - System Sensor Contacts - Supply and Return
  - Outdoor Air Sensor Contacts
  - Contacts for Air Louvers
  - Contacts on Any Failure
  - Cascade Contacts
  - 0-10 VDC BMS External Control Contact
  - 0-10 VDC Rate Contacts

Registered under U.S. Patent # 5,989,020

## For Ease In Ordering By Model Number



This heater is 500,000 Btu/hr natural gas Copper-Fin™ II boiler. It has M9 firing controls.



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