

HIGH EFFICIENCY COMMERCIAL WATER HEATERS

# **COPPER-FIN II<sup>®</sup>**



## **SMART<sup>™</sup> SYSTEM**

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.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 water heater 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 that redefined the industry. The Copper-fin II was the first proportional fired, fan-assisted water heater on the market. Every model features a small footprint for easy passage through a 36" door, low NOx emissions – 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 water heaters.

### THERMAL EFFICIENCY

Copper-Fin II water heaters 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 swept-fin copper tube 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 and 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 five year limited warranty.



### SPACE SAVING, SERVICE FRIENDLY DESIGN

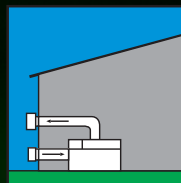
Our enhanced Copper-fin II models offer the same reliable operation in a new service friendly design. The gas inlet, internal controls and Building Management connections have been repositioned to the front of the appliance for easier service and simpler installation. The built-in air filter reduces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

**STACK  
FRAME**

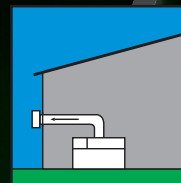
### MULTIPLE VENTING OPTIONS

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 water heater can be installed outdoors with an optional Outdoor Vent Cap.

Aire-Lock® Direct Vent



Sidewall



# High Efficiency Commercial Water Heaters



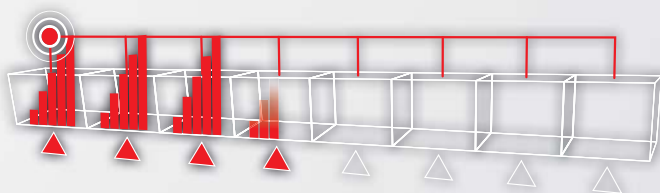
## REFINED DESIGN PUTS MORE CONTROL AND INFORMATION AT YOUR FINGERTIPS

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 WATER HEATERS
- FRONT END LOADING CAPABILITY WITH ARMOR WATER HEATER
- 0-10 VDC BMS INPUT TO CONTROL WATER HEATER OPERATION
- MODBUS PROTOCOL - OPTIONAL

## CASCADE OPTIONS



The "lead unit" water heater stages with demand to capacity. As demand increases, additional water heaters fire and stage to capacity. This continues, with additional water heaters firing and stage to capacity until all units are operating. Every 24 hours, the SMART SYSTEM automatically shifts the lead water heater 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 input rate down to approximately 25% Btu/hr input. This simple but effective design matches the water heater's firing capacity to the constantly changing system demand on the water heating system. 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.

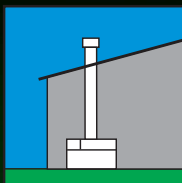
## PACKAGE SYSTEMS

Our uniform fabricated package systems let you create storage and recovery solutions that perfectly match each application. Teamed with our Lock-Temp® tanks, Copper-Fin II® provides the constant water temperature needed to meet load requirements.

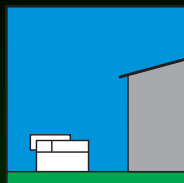
Our package systems are pre-engineered, factory assembled on an I-beam frame and come fully assembled with all piping needed for specific applications.



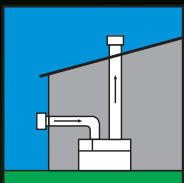
Conventional



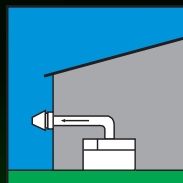
Outdoor



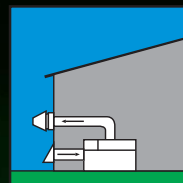
Direct Aire Vertical w-sidewall Inlet



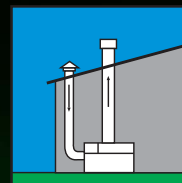
Powered Sidewall



Power DirectAire Horizontal

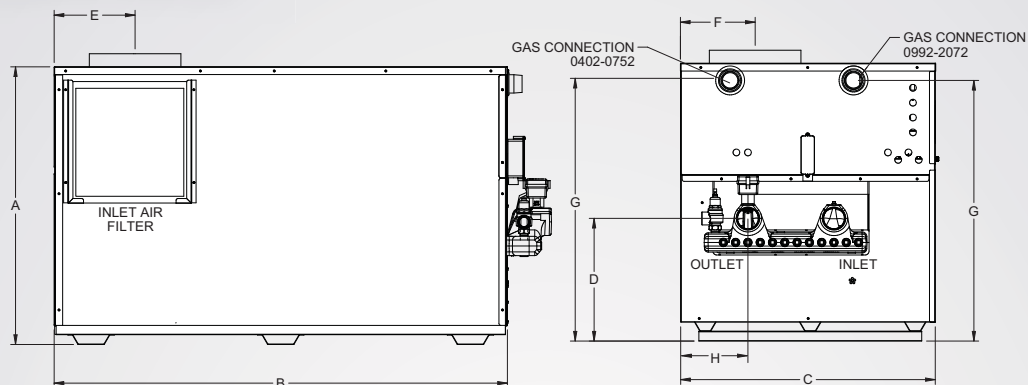


DirectAire Vertical





# COPPER-FIN II® Commercial Gas Water Heater Dimensions & Specifications



Copper-Fin II Water Heater

Dimensions & Specifications

Model Number	Input MBH	GPH @ 100°F Rise	A	B	C	D	E	F	G	H	Vent Size	Air Inlet	Gas Conn	Shipping Weight
CFN0402PM	399	412	31-1/2"	37-3/4"	22-1/4"	12-1/2"	7"	7"	29"	6-1/2"	6"	6"	1-1/4"	454
CFN0502PM	500	515	31-1/2"	45-1/2"	22-1/4"	12-1/2"	7"	7"	29"	6-1/2"	6"	6"	1-1/4"	467
CFN0652PM	650	670	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"	551
CFN0752PM	750	773	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"	611
CFN0992PM	990	1,020	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"	843
CFN1262PM	1,260	1,298	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"	939
CFN1442PM	1,440	1,484	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"	1,035
CFN1802PM	1,800	1,855	36"	82-1/4"	33-1/2"	15-3/4"	11"	11"	33-3/4"	8-3/4"	14"	12"	2"	1,168
CFN2072PM	2,070	2,133	36"	92-1/2"	33-1/2"	15-3/4"	11"	11"	33-3/4"	8-3/4"	14"	12"	2"	1,285

Notes: Change 'N' to 'L' for LP gas models.

No deration on LP models

Header increases "B" dimension 3-1/2" for models CF 0402-0752 and 6-1/4" for models CF 0992-2072

Pump and flanges are shipped loose for field installation.

Water connections for models CF 0402-0752 are 2" NPT on 6-1/2" centers.

Water connections for models CF 0992-2072 are 2-1/2" NPT on 11-1/4" centers.

Performance data is based on manufacturer test results.

## STANDARD FEATURES

- › 85% Thermal Efficiency
- › 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, "HLW" Stamped
  - › Gasketless design
  - › 160 psi working pressure
- › On/Off Switch
- › Combustible Floor Rated (CF 0992-2072)
- › Adjustable High Limit w/ Manual Reset
- › Low Lead Circulating Pump
- › Flow Switch
- › Low Air Pressure Switch
- › Inlet & Outlet Temperature Sensors
- › Easy Access Terminal Strips
- › Downstream Test Cocks
- › 150 psi ASME Temperature and Pressure Relief Valve
- › 1 Year Warranty on Parts (See Warranty for Details)
- › 5 Year Limited Warranty (See Warranty for Details)

## SMART SYSTEM™ FEATURES

- › SMART SYSTEM™ Operating Control
  - › 2 Line/16 Character LCD Display
  - › Built in Cascading Sequencer for up to 8 water heaters
  - › Front-End Loading Capability with Armor Water Heaters
  - › Building Management System Integration with 0-10 VDC Input
  - › 0-10 VDC Rate Output
  - › Password Security
  - › Low Water Flow Control & Indication
  - › Inlet & Outlet Temperature Readout
  - › Freeze Protection
  - › Condensing Protection
  - › Service Reminder
  - › Time Clock
- › Data Logging
  - › Hours Running
  - › Ignition Attempts
  - › Last 10 Lockouts
- › Programmable System Efficiency Optimizers
  - › Night Setback
- › Pump Control
  - › Water Heater Pump
  - › Recirculation 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
- › Alarm on Any Failure Contacts
- › Runtime Contacts
- › Unit Enable/Disable Contacts
- › Tank Sensor Contacts
- › Contacts for Air Louvers
- › Contacts on Any Failure
- › Cascade Contacts
- › 0-10 VDC BMS External Control Contact
- › 0-10 VDC Rate Output Contacts

## 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 (CF 0402-0752)
- › Stack Frame

## FIRING CODES

- › M7 Firing Code - California Code
- › M9 Firing Code - Hot Surface Ignition with Electronic Supervision

## CERTIFICATIONS

- › ANSI Z21.10.3/CSA 4.3 certified
- › South Coast Air Quality Management District
- › Texas Commission on Environmental Quality

For Ease In Ordering By Model Number

CF	N	502	PM	M9
MODEL	FUE TYPE	INPUT	PUMP PROVIDED	FIRING CONTROLS

This heater is 500,000 Btu/hr natural gas Copper-Fin® II water heater with supplied pump. It has M9 firing controls.



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LOW LEAD CONTENT

HLW