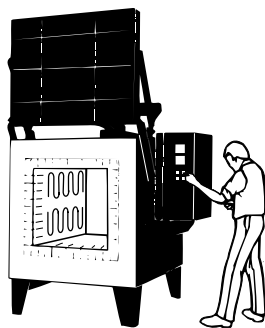




**BULLETIN  
FH-750**

# Box Furnaces



**2000°F  
HEAVY DUTY  
ELECTRIC AND GAS  
HEAT TREATING  
FURNACES**

Grieve standard 2000°F heat treating furnaces are used for a variety of heat treating applications such as tempering, hardening, sintering or firing, including those requiring inert atmospheres. Precision microprocessor based temperature controls and energy-saving insulation maximize the performance of these rugged units. Thirteen standard models from 3.9 to 96 cubic feet, built for long, hard, continuous use.

## STANDARD FEATURES

- **UL LISTED CONTROL PANEL**
- **Standard Box Furnaces from Grieve meet the requirements of National Fire Protection Association Standard 86, Industrial Risk Insurers, Factory Mutual and OSHA standards. For some applications, such as those involving special atmospheres or hazardous locations, the above organizations require additional safety devices.**
- **Controls**
  - Digital, microprocessor based, thermocouple actuated, indicating temperature controller
  - Modulating burner on gas furnaces
  - Motor control push buttons and on-off heat switch
  - LED pilot light
- **Safety Equipment—Electric Furnace**
  - Adjustable, thermocouple actuated, manual reset excess temperature controller
  - Separate heating element control contactors
  - Door interlock switch turns off power to heating elements when door is opened; restores power when door is closed
- **Safety Equipment—Gas Furnace**
  - Adjustable, thermocouple actuated, manual reset excess temperature controller
  - Electronic flame safeguard protection
  - Combustion air blower with air flow safety switch
  - Purge timer
  - High gas pressure switch
  - Low gas pressure switch
  - Two pilot safety shutoff valves with leak test stations
  - Two main safety shutoff valves with leak test stations\*
  - Valve position indicator on main safety shutoff valves
  - Over 400,000 BTU/HR safety shutoff valve interlocked with purge timer
- **Construction**
  - $\frac{3}{16}$ " steel plate reinforced furnace shell
  - $\frac{1}{2}$ " thick steel front plate
  - Brushed stainless steel control panel face
  - Powered vertical lift door
  - Door hot side faces away from operator at all times
  - Energy-saving lightweight ceramic fiber insulation reduces operating costs
  - Heavy duty ceramic hearth plates supported by firebrick piers
  - Excellent temperature uniformity throughout workspace
  - Fast heat-up and cool-down
  - 1 year limited warranty
- **Every furnace fully assembled and individually factory tested**



\*Industrial Risks Insurers vent valve only provided at specific request  
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**MODEL HD-304830 ELECTRIC  
WITH OPTIONAL SHUT DOWN TIMER, BATCH TIMER  
WITH AUDIBLE ALARM, AND ALLOY HEARTH TRAY**

# SPECIFICATIONS

NOT FOR USE WITH FLAMMABLE SOLVENTS, VAPORS OR GASES.

Model	Work Space		Outside Dimensions* (WxDxH)	Height Door Open	Door Type	Hearth Rating Lbs‡	Heat Input		Operating Characteristics†				Approx Shipping Weight
	Dimensions (WxDxH)	Volume Cu Ft					KW	BTU/HR	Control Accuracy	Furnace Uniformity	Rise Time		
											Electric	Gas	
HD-153015	15" x 30" x 15"	3.9	37" x 53" x 63"	78"	Manual♦	230	18**	225,000	±0.3%	±15°F	45 min	35 min	1500 lbs
HD-183618	18" x 36" x 18"	6.7	53" x 73" x 75"	98"	Electric	320	24	300,000	±0.3%	±15°F	175 min	130 min	2650 lbs
HD-243618	24" x 36" x 18"	9	59" x 73" x 75"	98"	Electric	450	33	360,000	±0.3%	±15°F	135 min	120 min	3000 lbs
HD-243624	24" x 36" x 24"	12	59" x 73" x 80"	108"	Electric	450	40	440,000	±0.3%	±15°F	125 min	110 min	3600 lbs
HD-244824	24" x 48" x 24"	16	59" x 85" x 80"	108"	Electric	600	48	525,000	±0.3%	±15°F	120 min	105 min	4100 lbs
HD-304830	30" x 48" x 30"	25	67" x 85" x 86"	116"	Electric	750	56	650,000	±0.3%	±16°F	120 min	90 min	4500 lbs
HD-306030	30" x 60" x 30"	31	67" x 96" x 86"	116"	Electric	850	60	700,000	±0.3%	±16°F	135 min	105 min	5100 lbs
HD-364836	36" x 48" x 36"	36	74" x 85" x 126"	126"	Air	950	66	750,000	±0.3%	±18°F	140 min	100 min	5250 lbs
HD-366036	36" x 60" x 36"	45	74" x 96" x 126"	126"	Air	1150	73	800,000	±0.3%	±18°F	140 min	100 min	5700 lbs
HD-367236	36" x 72" x 36"	54	74" x 108" x 126"	126"	Air	1350	86	950,000	±0.3%	±18°F	140 min	95 min	6300 lbs
HD-484836	48" x 48" x 36"	48	86" x 85" x 126"	126"	Air	1200	78	850,000	±0.3%	±20°F	135 min	90 min	6200 lbs
HD-484848	48" x 48" x 48"	64	86" x 85" x 150"	150"	Air	1400	92	1,000,000	±0.3%	±20°F	130 min	90 min	6900 lbs
HD-487248	48" x 72" x 48"	96	86" x 108" x 150"	150"	Air	2000	135	1,400,000	±0.3%	±22°F	120 min	90 min	8500 lbs

\* All Models—Control panel overhang 9" right side.  
 Gas Models—Combustion blower overhang 36" rear.  
 ♦ Gas spring assists operation. Construction similar to electric door.  
 \*\* Heating elements located on sidewalls and roof only; 13.5 KW and 80 minute rise time on 230 volts.

† Accuracy as percent of controller span. Uniformity at 100°F below maximum temperature. Rise Time in minutes to 100°F below maximum temperature. Tests run with empty furnace. Performance will vary with load and application. See Bulletin TC-920 for additional details.

‡ Uniformly distributed.

## STANDARD EQUIPMENT

### ● All Models

- 208 volts, 3-phase, 60 Hz
- 230 volts, 3-phase, 60 Hz
- 460 volts, 3-phase, 60 Hz
- Other electrical characteristics available

Wall insulation, 7" thick, consisting of:

- 5" of 2300°F, 8 lbs/cf ceramic fiber blanket
- 2" of 1700°F, 4 lbs/cf ceramic fiber blanket

Floor insulation, 6½" thick, consisting of:

- 4½" of 2300°F insulating firebrick
- 2" of 1900°F, 18½ lbs/cf block insulation

Furnace shell is made of 3/16" thick steel plate reinforced with structural steel. Doorsill constructed from firebrick to protect furnace during loading. Ceramic hearth plates are 2" thick and supported by firebrick piers. Soft insulation on door provides an excellent heat seal by pressing against the vestibule refractory and the ½" thick steel front plate. Exterior painted with Trillite Green enamel.

Each features completely wired, side access UL listed control panel assembled on the furnace enclosing terminals for incoming power, temperature controllers, push buttons and pilot lights.

### ● Electric Models

Safety devices as listed on the front of this bulletin. Heating element contactors electrically interlocked with door to shut off power to heaters as door opens and restore power when closed. High temperature alloy wire heating elements supported in vacuum cast ceramic fiber. Heating elements located at sides, rear, door and under hearth, except as noted.

### ● Gas Models

- 1,000 BTU natural gas at 2 psig pressure; 1" NPT inlet up to 800,000 BTU/HR
- 1¼" NPT 850,000 to 1,000,000 BTU/HR
- 1½" NPT at 1,400,000 BTU/HR
- Other gas characteristics available

Safety devices as listed on the front of this bulletin. Automatic pre-ignition purge period and push button electric ignition contributes to ease of operation. Modulating gas burners fire beneath hearth from opposing sides to circulate heated air through the work space. (HD-153015 has single burner firing above load from rear) Gas burners protected with electronic flame safety relay. Door interlock switch drives main

burners to low fire when door is opened and restores control when door is closed.

### ELECTRIC DOOR

Door pivots upward above furnace, clearing front for easy loading. In the closed position, full door weight seats door firmly against furnace face. Structural steel pivot arms are supported at furnace sidewalls by bearings and connected to a heavy duty electromechanical actuator. The door is controlled by a switch at the furnace control panel.

### AIR DOOR

Door rises vertically in front of the furnace hanging from heavy duty roller chain, sprockets, shaft and pillow block bearings. In the closed position, rollers at the sides of the door engage support brackets to force the full door weight against the furnace face. Large diameter air cylinder rotates support shaft to lift the door. The door is controlled by a manual air valve with supply filter, lubricator and regulator. Requires 60 psig compressed air.

## ADDITIONAL EQUIPMENT AVAILABLE\*

● **Programmable Temperature Controller**, microprocessor based, digital indicating, thermocouple actuated, in lieu of standard controller . . . . . **PTC3**

● **Recording Thermometer**, thermocouple actuated, 24-hour, 10" diameter circular chart used in conjunction with standard controller . . . . . **RT**

● **Programmable Recording Temperature Controller**, microprocessor based, thermocouple actuated, digital display, 24-hour, 10" diameter circular chart, in lieu of standard controller . . . . . **PRTC3**

● **Digital Timing Temperature Controller**, microprocessor based, digital indicating, incorporates 99 hour 59 minute timer, starts timing when temperature reaches set point and shuts down oven at end of set time . . **DTS3**

● **Shut Down Timer**, with continuous "hold" feature; 1, 5, 10 or 30 hour range . . . . **SDT**

● **Batch Timer**, for uniformly timing batch operations. Continuous alarm with door interlock; alarms at end of preset time period until door is opened or timer reset; 1, 5, 10 or 30 hour range . . . . . **BT**

● **Alloy Hearth Tray**, made of heat resisting high temperature alloy, for protecting ceramic hearth plates from impact and heavy loading . . . . . **AH**

● **Recirculating Fan**, water cooled fans standard, air cooled available, improves temperature uniformity from 600°F to 1600°F, available on Model HD-30430 and larger, may reduce heat input on electric models, not available on gas models . . **RF**

● **Inert Atmosphere Construction**, electric only, includes continuously welded shell, inert atmosphere gas inlet and outlet, high temperature door gasket, sealed terminal boxes, optional forced cooling systems are available at additional cost. . . . . **IAC**

● **Inert Atmosphere Inlet Piping**, with indicating flow control and manual gas valve. Specify atmosphere . . . . . **IAIP**

\*See Bulletin TC-960 for modifications and other optional equipment.



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