

HEAVY DUTY 2,250°F (1,230°C) ATMOSPHERE CONTROLLED NEUTRAL HARDENING TOOL ROOM FURNACE

APPLICATIONS

- The CBH 124 box furnace is specifically designed for neutral hardening. In the basic model with inert atmosphere, some decarburization will be experienced because “inert” atmosphere is not totally neutral with regards to most carbon steels. The higher the carbon level of the steel, the less protection. This is because the carbon in the steel is highly reactive at high temperatures, with even the trace levels of oxygen and water vapor in a furnace purged with inert gas.
- With the Nitrogen/Propane Atmosphere Package, the furnace will do neutral hardening with virtually no decarburization or oxidation. Gas levels and resulting carbon levels obtained with the propane are set empirically with the manual controls.
- The CBH 124 incorporates many features such as a compact control panel/stand, pneumatic vertical door; silicon carbide hearth; heat shield; peephole; heavy gauge, low voltage elements; program control; high limit control; low mass ceramic fiber insulation that are normally options on many of L&L’s other furnaces. This makes for a very complete and “choice free” versatile oven. The maximum temperature of 2,250°F (1,230°C) allows this furnace to be used for high speed tool steels. The CBH 124 is highly uniform in temperature gradient.



FEATURES

KANTHAL APM HEAVY ROD OVERBEND ELEMENTS

Heavy duty, low voltage Kanthal APM sintered iron-aluminum-chrome alloy rod/overbend elements are standard. This alloy is highly resistant to carburizing and will take the high temperatures as well. The elements are located on the sides and bottom. These are particularly suited for carbon-rich atmospheres. With regular burnout in air, they will provide excellent life. The elements rely on their protection from the atmosphere by forming a thin aluminum oxide coating on the surface of the element. Because they have a thick (6mm) cross section, they are more resistant to breakage, cracking and embrittlement than thinner gauge wire coiled elements.

CERAMIC FIBER LIGHTWEIGHT INSULATION

The CBH 124 includes 2-1/2" of 2,600°F (1,442°C) low iron ceramic fiber board backed up with 2" of 1,900°F board and 4" of mineral wool. No asbestos or asbestos products are used in manufacture. This combination of insulation provides very efficient heat up characteristics and low heat losses.

HARD BRICK VESTIBULE

A refractory vestibule protects the elements, supports the hearth, minimizes the door opening to promote temperature uniformity, and allows for a very efficient interlocking door seal. The door seal includes a fiber gasket.

HEAVY DUTY ATMOSPHERE TIGHT CASE

The case and base are reinforced 10 gauge steel welded gas-tight with full gasketing. An integrated heavy duty stand is included. The case is primed with 800°F silicone paint and finished in machine enamel.

DOOR HEAT SHIELD

A heat shield is attached to the furnace door. This maintains an external door case temperature of 120°F.

BUILT-IN VENT HOOD

A vent hood is included to collect products of combustion from the burnoff and unspent gases when the door opens. This vent hood terminates in a 4" diameter standard duct fitting.

PNEUMATIC LIFT DOOR

A pneumatic cylinder lifts and tightly seals the vertical door. The door rides in guide tracks. Door operation is with a pneumatic hand-operated valve that allows the door to be raised or lowered with one switch.

SILICON CARBIDE HEARTH WITH MOLDED SIDES

The hearth is 1" thick silicon carbide with 1/2" high molded sides. Silicon carbide has excellent heat transfer characteristics, remains flat at high temperatures, and is strong.

PEEPHOLE

A 3/4" diameter peephole allows viewing inside the furnace without disturbing the atmosphere.

N₂/PROPANE ATMOSPHERE PREVENTS DECARB

In the nitrogen/propane system, the propane cracks into hydrogen, carbon monoxide, nitrogen and free carbon. This counteracts the decarburizing effect of trace oxygen and water vapor at high temperatures. The flow

system consists of a nitrogen and propane line. All necessary flowmeters, regulators, pressure gauges, pressure relief valves, solenoids and shutoff valves are piped in a self-contained flow panel that is mounted under the furnace (as shown) or under the control panel on the side of the unit. An integrated annunciator system with audible piezo-type buzzer alarm and push button silencer is provided to indicate any alarm condition. There is a 1,400°F alarm, below which propane does not flow. A nitrogen low flow switch prevents propane from flowing unless a minimum flow is achieved. Emergency purge is activated if there is a power failure. This atmosphere system is designed to meet or exceed the regulations of the National Fire Protection Agency for controlled atmosphere furnaces (NFPA86C).

HONEYWELL PROGRAM CONTROL SYSTEM

The standard control is a Honeywell UDC 3200 digital PID 3 mode tuning control program control with six ramps and six soaks. The power control is either a solid-state contactor or zero fired SCR. A power transformer supplies low voltage to the elements. All fuses, contactors and controls are located in a NEMA 12 panel with a fused disconnect switch. This can be mounted either under the furnace (as shown in the photograph) or on the side. The thermocouples are inconel sheathed Type K. The control voltage is transformed to 120 volts. A Honeywell UDC 1200 digital FM-approved high limit backup control with manual reset is included with backup contactors and a separate thermocouple element. The furnace features a door power cutoff switch. There is a single point power connection. The CBH 124 meets National Electrical Code.

TESTING AND INSTRUCTIONS

The furnace is tested to ensure proper watt ratings. A complete instruction manual includes easy startup instructions, theory of operation, maintenance instructions, a parts list, a detailed troubleshooting guide, a ladder logic diagram, panel layout, and general dimension and assembly drawings. Startup service and training is optional.

WARRANTY

The CBH 124 is warranted for one year except for elements and thermocouples, which are warranted for six months.

OPTIONS

- **TEMPERATURE RECORDERS:** Round or strip chart
- **AGITATED QUENCH TANKS & COOLING TABLES**
- **FLOOR MOUNTED PNEUMATIC DOOR SWITCH**
- **SCR POWER CONTROL**

SPECIFICATIONS

- **WORKING DIMENSIONS:** 12"W x 12"H x 24"D
- **INSIDE DIMENSIONS:** 17"W x 18-1/2"H x 29"D
- **HEARTH HEIGHT:** Hearth is 48-1/2" from floor
- **OUTSIDE DIMENSIONS:** 38"W x 112"H x 70"D
- **K.W.:** 12.5 **VOLTS:** 208/1/60, 240/1/60 or 480/1/60
- **MAXIMUM TEMPERATURE:** 2,250°F (1,230°C)
- **UNIFORMITY:** +/-15°F from 1,200°F to 2,250°F
- **MAXIMUM LOAD WEIGHT:** 150 Pounds