

HEAVY DUTY 1850°F (1010°C) ELECTRIC OR GAS FIRED CARBURIZING BOX FURNACES

APPLICATIONS

The CB Series box furnaces are specifically designed for carburizing, neutral hardening and, optionally, carbonitriding. They are front loading box furnaces with vertical doors, very tight atmosphere seals and complete atmosphere flow control systems. They have a normal maximum temperature of 1,850°F (1,010°C.)



FEATURES

KANTHAL APM ELEMENTS OR RADIANT GAS FIRED

Heavy duty Kanthal APM rod/overbend elements are standard. This alloy is highly resistant to carburizing. The elements are typically located on the sides, back and door for good uniformity. Gas fired radiant tubes with ignitors are also available.

INSULATION

The standard insulation is 4-1/2" of 2,300°F (1,260°C) low iron firebrick backed up with 4" of mineral wool. The roof is made of 2,300°F Pyroblock ceramic fiber modules. All-fiber insulation is an option. No asbestos is used.

HEAVY DUTY ATMOSPHERE TIGHT CASE

The case and base are reinforced 3/16" steel welded gas tight with full gasketing where necessary. The case is primed with 800°F silicone paint and finished in machine enamel.

TWO TYPES OF ATMOSPHERE SYSTEMS AVAILABLE

Two types of atmosphere systems are offered, the NM Nitrogen/Methanol and the EN Endothermic Gas atmosphere control system. Both feature the addition of natural gas or propane as the carburizing agent in a carrier gas of approximately 40% nitrogen, 40% hydrogen and 20% carbon monoxide. Ammonia can be added for carbonitriding. See NM and EN Bulletins for details. The atmosphere systems are designed to NFPA 86 guidelines. L&L will submit certified drawings such as FM or IRI to the customer's insurance carrier.

AUTOMATIC CARBON CONTROL WITH BOOST/DIFFUSE PROGRAM

The carbon level is controlled by a carbon control with oxygen probe for automatic carbon control. The desired carbon level is set in percentage of carbon desired. The standard carbon controller is a Honeywell UDC 3200. The standard oxygen probe is a Furnace Control Corp. AQ604-K-1 oxygen probe. This probe has a 12-month nonprorated warranty, which means that nothing is deducted for use if something goes wrong within 12 months. The boost/diffuse cycle is accomplished by changing a digital input on the carbon control automatically using an event switch on the program control. Details are included on EN and NM Bulletins.

WATER COOLED, ATMOSPHERE TIGHT FAN SYSTEM

A water cooled, atmosphere tight plug fan provides good temperature uniformity of +/-15°F (+/-8°C) within the working dimensions and uniform atmosphere distribution. This ensures consistent metallurgical results.

ELECTRIC VERTICAL DOOR WITH PNEUMATIC DOOR CLAMPS AND DOUBLE GASKETING

The door is counterbalanced and driven up and down by an electric gear motor with a torque limit safety. When the door is in the full down position, four pneumatic clamps automatically pull the door closed tightly against the two gasketed seals and into the heat interlock. This allows for an ex-

remely tight interlocking door seal with double gasketing that won't wear too rapidly. Because the presence of air leaks would decarburize and provide unpredictable results, this super tight door seal is critical.

FLAME CURTAIN

A flame curtain helps prevent air inrush when the door opens. It also ignites flammable gas when the door opens.

SAMPLE PORT

A combination atmosphere sample port and uniformity survey port includes a stainless steel shut off valve.

VARIOUS HEARTH AND LOADING SYSTEMS

The standard hearth is a series of piers for forklift or hydraulic loader loading. Cast or serpentine trays are common, as are loading baskets. Roller hearths are available on smaller models.

PROGRAM CONTROL SYSTEM WITH PLC LOGIC CONTROL AND SCR POWER CONTROL

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 a zero fired SCR. All logic control is accomplished on an Allen Bradley SLC500 programmable logic control. All fuses, transformers, contactors and controls are located in a NEMA 12 floor standing panel with a fused disconnect switch. Thermocouples are heavy wall inconel sheathed Type K. The control voltage is 20 volts. A Honeywell UDC 1200 digital high limit backup control with manual reset is included with backup contactors and separate thermocouple. It includes a door power cutoff switch and single point power connection, and meets National Electrical Code.

TESTING AND INSTRUCTIONS

The furnace is fully shop tested. A complete instruction manual includes easy startup instructions, theory of operation, maintenance instructions, parts list, detailed troubleshooting guide, ladder logic diagram, panel layout, and general dimension and assembly drawings on CAD.

STARTUP SERVICE

An L&L factory technician will review and check out the customer's installation, startup, burn in furnace, and train the operators. Typically this takes one week.

WARRANTY

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

OPTIONS

- **TEMPERATURE RECORDERS:** Round or strip chart. Recorders record both temperature and carbon levels.
- **AGITATED HEATED QUENCH TANKS**
- **LOADER:** A special hydraulic forklift loader is available. This allows for easy loading and unloading.
- **VIEW PORT:** Atmosphere tight with sliding damper.

SPECIFICATIONS

Model Number	Working Dimensions			Inside Dimensions			Outside Dimensions			Stand K.W.	High K.W.	Load Weight	Ship Weight
	W	H	D	W	H	D	W	H	D				
CB 222	24	24	24	34	45	34 1/2	60	108	66	51	68	400	5,500
CB 223	24	24	36	34	45	46 1/2	60	108	78	63	84	600	6,000
CB 224	24	24	48	34	45	58 1/2	60	108	90	74	99	800	6,800
CB 324	36	24	48	46	45	58 1/2	72	108	90	89	118	1,200	7,500
CB 326	36	24	72	46	45	82 1/2	72	108	114	115	150	1,800	9,000

Larger sizes are available. Dimensions are in inches. Weight is in pounds. Add another 60" to width for control and atmosphere panel floor space requirements. Hearth height is 42". Special sizes are available. 240 or 480 volts is normal. 208, 380 or 575 are optional. 3 phase is normal although single phase is available. Specifications subject to change without notice.

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