L&L Special FURNACE CO, INC

TB Series

2,100°F (1,150°C) CERAMIC FIBER LINED SPLIT TUBE FURNACES

APPLICATIONS

The TB Series bench mounted electric tube furnaces feature even heating around the perimeter of the tube, ceramic fiber insulation and split tube construction for easy changing of the tubes. A variety of tubes may be used or supplied by L&L, depending on the application. The sizes listed in the specification sheet are easily modified to suit various applications. The TB Series is normally limited to 2,100°F (1,150°C.) Elements are rated for 2,200°F (1,200°C.)

FEATURES

LOW MASS INSULATION

The furnace is insulated with 6" of low "K" factor ceramic fiber and mineral wool insulation. Two inches of this insulation consists of a removable molded element/insulation module that lines the interior of the furnace. It is not brittle, so maintenance is minimal. The insulation has a very low thermal mass and hence heats up very quickly. Heat-up to 1,800°F (980°C) takes approximately 45 minutes. No asbestos is used.

CERAMIC FIBER MOLDED ELEMENTS

The elements are embedded in ceramic fiber and are made of iron-aluminum-chrome alloy. They are preoxidized (which is what protects

this alloy from the high temperatures). Element sections are easily replaced. The elements are evenly spaced along the entire surface of the interior and hence will provide the maximum in temperature uniformity by consistently radiating along the entire surface of the tube. The insulation is fitted with vestibules at both ends. These protect the elements and help hold the tube in place, as well as hold heat in around the tube. The vestibules split open with the furnace case.

BENCH MOUNTED CASE CONSTRUCTION

The furnace case is constructed of welded 10- and 14-gauge steel. There is a detached control panel that contains all controls, control components and power supply. The case is primed with 800°F silicone paint and finished in machine enamel. The hinged case splits open in the center from one side and latches closed on the other side.

DIGITAL PID CONTROL SYSTEM

The standard control is a Honeywell UDC 2500 digital PID 3 mode control. Solid-state contactors are standard. SCR power controls are optional. Thermocouples are Type K. The control voltage is transformed to 120 volts. Control and power circuits are branch fused. A NEMA 13 lighted on/off switch is included. All fuses, transformers, contactors and controls are located in a bench mounted NEMA 1 panel. The customer must connect fused power supply to a single point on the panel.

TESTING AND INSTRUCTIONS

The furnace is power tested to ensure proper watt ratings. The controls are fully calibrated and the control system is thoroughly tested. A complete instruction manual includes startup instructions, theory of operation, maintenance instructions, parts list and a detailed troubleshooting guide. A ladder logic diagram and panel layout are prepared on CAD for easy readability.

WARRANTY

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

OPTIONS

- **HIGH UNIFORMITY OPTION:** See the TBU Bulletin.
- **SCR POWER CONTROLS:** These provide more even heating, longer element life and greater uniformity.
- **OVERTEMPERATURE SYSTEM:** Honeywell UDC 1200 digital high limit backup control with manual reset, backup contactors and separate thermocouple.
- **JIC CONTROL OPTION:** This includes a NEMA 12 control cabinet, all oil tight switches and a panel mounted fused disconnect switch.
- **ATMOSPHERE CONTROL:** Inert atmosphere and combustible atmosphere systems are both available. See H2 and MPH Bulletins, which explain the various safety systems for hydrogen and forming gas atmospheres.
- **TUBES AND RETORTS:** Alloy retorts are made of 304, 330 or 601 alloys, typically with water-cooled "O" ring seals; ceramic and quartz tubes are also available.
- **RAMP/SOAK PROGRAM CONTROLS**
- **TEMPERATURE RECORDERS:** Round and strip chart.
- **ANGLE IRON STAND:** Includes braced angle iron legs with leveling bolts.

SPECIFICATIONS

Model Number	Tube Diameter	Element Diameter	Heated Length	Outside Dimensions			K.W.	Ship Weight
TB 112	1	2	12	12	18	15	1.1	200
TB 124	1	2	24	12	18	27	2.2	250
TB 212	2	3 ½	12	14	20	16	1.8	250
TB 224	2	3 ½	24	14	20	28	3.6	300
TB 312	3 ½	5	12	17	23	18	2.5	300
TB 324	3 ½	5	24	17	23	30	5.0	350
TB 336	3 ½	5	36	17	23	43	7.1	400
TB 512	5	6 ½	12	19	25	19	3.0	350
TB 524	5	6 ½	24	19	25	31	6.0	400
TB 536	5	6 ½	36	19	25	43	8.4	450
TB 612	6 ½	8	12	21	27	19	3.6	400
TB 624	6 ½	8	24	21	27	31	7.0	450
TB 636	6 ½	8	36	21	27	43	10.0	500
TB 824	8	10	24	23	29	31	8.4	500
TB 836	8	10	36	23	29	43	12.0	575
TB 1224	12	14	24	27	33	31	12.0	600
TB 1236	12	14	36	27	33	43	16.8	700
TB 1248	12	14	48	27	33	56	24.0	800
TB 1272	12	14	72	27	33	79	33.6	1000
TB 1424	14	16	24	29	35	31	14.0	700
TB 1436	14	16	36	29	35	43	18.0	825
TB 1448	14	16	48	29	35	56	28.0	950
TB 1472	14	16	72	29	35	79	36.0	1,200

Dimensions are in inches. Weight is in pounds. Above are standard sizes; however, any diameter up to 60" is possible and any length is possible. The typical control panel is 17" wide by 38" high by 20" deep. Voltage can be 208, 240 or 460 single phase except the TB 112, which can only be 240 or 208 volts; other voltages are optional. Three phase is possible but some models will have unbalanced loads. Specifications are subject to change without notice.

20 Kent Road • PO Box 2129 • Aston, PA 19014 T: 610.459.9216 • F: 610.459.3689 • llfurnace.com• sales@llfurnace.com