

CERAMIC FIBER LINED ELECTRIC AND GAS FIRED PIT FURNACES UP TO 2,400°F (1,315°C)

APPLICATIONS

The PT Series are ceramic fiber lined pit furnaces. They can be designed for either air or controlled atmosphere applications, and are built to be located in a pit in the floor. The furnaces load from the top. They can be electric or gas fired. Various kinds of element systems are used for the electric versions. Each one is custom designed for a specific application. Specifications are per detailed quotation. Typical applications include carburizing, carbonitriding and tempering of long shafts. Complete atmosphere control systems are available. Temperatures to 2,200°F (1,200°C) are available. Uniformity of +/-10°F (+/-5°C) is possible.



FEATURES

TYPES OF HEAT SOURCES

Depending on the application, a wide variety of heat sources can be used. Gas fired units can be direct fired when atmosphere control is not important. Radiant tubes are used on gas fired units when atmosphere must be controlled. Electric furnaces can feature coiled, ribbon or rod-type elements or can have elements enclosed in radiant tubes. Top to bottom zoning is possible with some types of elements.

CERAMIC FIBER INSULATION FEATURES FAST HEAT-UP AND COOLDOWN

The entire furnace, except for portions of the hearth, is insulated with ceramic fiber and mineral wool. The total insulation thickness is typically 8." 2,600°F (1,425°C) fiber is used for 2,200°F (1,200°C) furnaces and 2,300°F (1,260°C) fiber is used for 2,000°F (1,095°C) or below. The bottom, where a fan is typically located, normally has castable refractory for erosion resistance. No asbestos is used.

HEAVY-DUTY CASE

The case is typically made of strongly reinforced 3/16"-thick steel. It is primed with 800°F silicon paint and finished in machine enamel. Larger units are fabricated in more than one section for shipping purposes and erected on-site.

DOOR AND SEAL

The typical door seal is a wide pad of ceramic fiber. This seals against a rigid ceramic fiber board attached to the case. Controlled atmosphere furnaces can also feature sand seals. The most common door is a counterbalanced lift and swing door.

FANS

Most of these furnaces feature bottom mounted fans for recirculation of the furnace atmosphere. These are typically water-cooled fans that mount as a plug unit. Recirculation baffles are typically also used.

ATMOSPHERE CONTROL SYSTEMS

The PT Series can be designed for controlled atmosphere. Atmosphere can be inert, endothermic, slightly carburizing, exothermic, etc. See the separate MPN, MPH, NM and EN Series Bulletins for information concerning L&L's atmosphere control panels.

DIGITAL PID CONTROL AND HIGH LIMIT SYSTEM

The standard control is a Honeywell UDC 2500 digital PID 3 mode tuning control. All fuses, transformers, contactors and controls are housed in a floor standing NEMA 12 panel with a fused disconnect switch. Quiet, long-life solid-state contactors are standard, although SCR power control is a common option. Thermocouples are inconel sheathed Type K. Thermocouple break protection is included. A Honeywell UDC 1200 digital high limit back-up control with manual reset, backup contactors and separate thermocouple is provided. A NEMA 13 lighted on/off switch and NEMA 13 door power cutoff switch are included. Control voltage is transformed to 120 volts. The control circuit and each power branch circuit are fully fused. Single-point power connection. Meets National Electrical Code.

TESTING AND INSTRUCTIONS

The furnace is power tested to ensure proper watt ratings. A complete instruction manual includes easy startup instructions, theory of operation, maintenance instructions, parts list, general dimension drawing, general assembly and subassembly drawings where required, and a detailed troubleshooting guide. A ladder logic diagram and panel layout are prepared on CAD for easy readability.

STARTUP SERVICE

L&L will check out and leak test the atmosphere system, inspect the customer's furnace assembly, repair any refractory cracks, check the tightness of the elements, start up equipment, tune the controller, adjust SCR, instruct customer's personnel in how to do this, train operator in the use of the control systems, review the furnace manual, test for proper operation of all components and systems, and start, watch and run the bakeout cycle.

WARRANTY

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

OPTIONS

- **RAMP/SOAK PROGRAM CONTROLS**
- **TEMPERATURE RECORDERS:** Round or strip chart.
- **SCR POWER CONTROL:** For greater precision. Can be multi-zoned with digital biasing.
- **MANUAL OR POWERED VENTURI VENT:** A manual or powered venturi can be provided for fast cooling or venting. This can be programmable.