Technical Specifications for a Dual Chamber Heat Treat Furnace  
Keith Model no.: K-12 12 20-D*

(*will vary upon selected options)

1.0 General

1.1 The Keith Dual Chambered electrically heated furnace we propose to supply will be described in the specifications that follow. This special furnace comprises two independently operated furnace chambers that have been assembled one above the other, and then integrally wired to create a single space saving unit.

1.2 The upper heating chamber is intended for hardening metals at higher temperatures. Compactly stored beneath the furnace is an optional rollout quench tank so metal parts may be taken directly out of the hardening chamber and quickly quenched. The independently operated lower furnace chamber is then available for tempering or drawings at lower processing temperature.

1.3 Hearth space in the (upper) hardening chamber is 12-inch wide by 20-inch deep, and the chamber has a 12-inch tall setting height. The lower tempering chamber with fan recirculation measures 12-inch wide by 17-inch deep, and the chamber has a 12-inch tall setting height.

1.4 Exterior construction of the furnace consists of heavy gauge sheet metal enclosures around each heating chamber. A strong structural steel framework supports the two heating chambers.

1.5 Operating & Service manual will be provided with electrical diagram together with instruction booklets for the model of Watlow temperature controllers you order.

2.0 Upper Furnace Chamber

2.1 Walls, roof, door and floor are each insulated with 2-1/2 inches of thermally efficient insulating firebrick backed up by 1900°F rated board insulation and rated for use up to 2250°F.

2.2 The door opens by rising vertically while keeping the heated surface hot face safely away from the furnace operator.
2.3 Coiled wire heating elements are installed in porcelain element plates that are mounted to each sidewall of the furnace heating chamber. Total heating capacity of the upper high temperature heating chamber is 6.2 kilowatts.

2.4 Temperature will be automatically controlled by a Watlow series PM3E set point temperature controller (with timer function). More information about this instrument as well as two upgraded models of Watlow instrument (e.g., Watlow series PM4R programmable ramp/soak controller with up to 4 different programs each with up to 10 steps; or the very nice series F4 programmable controller that is fully featured with up to 256 programming steps in 40 different programs) are featured on our website. A separate type “K” thermocouple will be supplied for each instrument purchased.

2.5 Power to the heating elements is controlled steplessly and silently by a solid-state relay.

2.6 An optional high limit temperature protection is also available by choosing to purchase a Watlow LV series instrument with separate type “K” thermocouple. We highly recommend the purchase of this protection for each heating chamber so expensive tooling you are producing or the fan in the lower chamber cannot be damaged due to overheating.

3.0 Lower Furnace Chamber

3.1 Walls, roof, door and floor are each insulated with thermally efficient firebrick and board insulation that is well rated for use up to a 1250°F operating temperature.

3.2 The door in this chamber is hinged and swings opens to the side.

3.3 Coiled wire heating elements are installed in porcelain element plates that are mounted to each sidewall of the furnace heating chamber. Total heating capacity of the lower high temperature heating chamber is 4.3 kilowatts.

3.4 Temperature controls, thermocouples, power control for this chamber are much the same as the upper chamber except as any difference are explained here, including alternative choices of Watlow temperature controllers, as well as optional high limit protection that is highly recommended.

3.5 Circulation of the atmosphere within this chamber is produced by a 500 CFM capacity alloy fan that is belt driven by a 1/4 h.p. motor. The fan creates a high rate of circulation and temperature uniformity within this furnace chamber.
4.0 Temperature & Power Control Enclosure

4.1 Furnace controls for both heating chambers will be mounted in a single control panel mounted to the side of the furnace that has been integrally wired to the rest of the furnace. Operating controls include the temperature controllers, as well all operating switches and indicator lights.

5.0 Optional Quench Tank

5.1 The 17-inch square by 17-inch deep quench tank is fabricated with 3/16-inch thick steel sheet that is continuously welded and then painted with a good quality industrial paint.

5.2 Tank rolls on 2-inch diameter wheels so it can be easily moved in and out from under the furnace as needed.

6.0 Utilities Required

6.1 Standard Voltage for this furnace at no additional expense is 240 Volt, single phase, 60 Hz. Nominally this furnace may be connected to a 50 Amps rated electrical service consisting of 240 Volt, single phase.

6.2 Alternatively, this furnace can be wired for use with 208 or 480 Volt, single or 3-Phase, 60 Hz electrical power for a nominal increase in price. Please specify your choice when ordering. The Amperage draw alternative Voltage and phase for this furnace will depend upon the chosen Voltage and/or phase.

7.0 Heat Treat Wrap

7.1 Keith stainless steel heat treat tool wrap is the common and most cost-effective solution for preventing your parts from oxidizing during heat-treating. A small amount of paper or charcoal wrapped inside the heat treat foil often helps to consume fugitive oxygen within the package.

7.2 Two grades of heat-treat wrap foil are available. Our premium high temperature grade stainless steel foil is #309 grade that is suitable for use to 2240°F, or our most popular #321 grade that is suitable for use to 2000°F.