

## A. General Specifications

|                                    |          |          |
|------------------------------------|----------|----------|
| Maximum temperature rating:        | 350°C    |          |
| Nominal operating temperature:     | 80-350°C |          |
| Number of controlled heated zones: | 8 Top    | 8 Bottom |
| Oven atmosphere:                   | Air      |          |
| Working dimensions:                |          |          |
| Conveyor belt                      | 18 in.   | 457 mm   |
| Product clearance                  | 2 in.    | 51 mm    |

## B. Dimensional Layout

| Description                      | Inches     | Centimeters  |
|----------------------------------|------------|--------------|
| Entrance Onload Area             | 13.0       | 33.0         |
| Lip Vent Exhaust                 | 14.0       | 35.6         |
| Zone 1                           | 12.5       | 31.8         |
| Zone 2                           | 12.5       | 31.8         |
| Zone 3                           | 12.5       | 31.8         |
| Zone 4                           | 12.5       | 31.8         |
| Zone 5                           | 12.5       | 31.8         |
| Zone 6                           | 12.5       | 31.8         |
| Zone 7                           | 12.5       | 31.8         |
| Zone 8                           | 12.5       | 31.8         |
| <b>Total Heated Length</b>       | <b>100</b> | <b>254.0</b> |
| Lip Vent Exhaust                 | 12         | 30.5         |
| Fan Cooling                      | 24         | 61.0         |
| Exit Offload Area                | 20         | 50.8         |
| <b>Total System Length</b>       | <b>183</b> | <b>464.8</b> |
| <b>Total System Width</b>        | <b>60</b>  | <b>152.4</b> |
| <b>Total System Height</b>       | <b>60</b>  | <b>152.4</b> |
| <i>(Assumes 36" Hearth Line)</i> |            |              |

## C. Process Chamber

### Heating Section

- Heating is accomplished via *Forced Impingement Convection* with side to side gas recirculation. Forced convection is provided by a proprietary blower system.
- Each zone utilizes BTU's *Porcupine II heating element*. This element features a low mass, high surface area open coil wire arrangement for fast response time and high reliability.
- Zones 1, 2, 7 and 8 employ *5-kilowatt* heating elements top and bottom. Zones 3, 4, 5 and 6 employ *2.7 kilowatt* heating elements top and bottom. 5-kilowatt heating elements are available for all zones as an option.
- Oven loading capability is 2 lbs/ft<sup>2</sup> (10 Kg/m<sup>2</sup>) based on a nominal conveyor speed of 32 in/min. (81.3 cm/min.). With optional 5kW heaters in all zones the loading capacity increases to 3 lbs/ft<sup>2</sup> (15 Kg/m<sup>2</sup>)
- The process chamber is a clamshell design and includes the capability to process large format printed circuit boards up to 18 X 24 inches (457mm X 610mm). 24 x 24 inch (610mm x 610mm) board capability is available as an option
- Cross belt temperature uniformity is within a 4<sup>0</sup> C delta T in the reflow zone. (using standard BTU uniformity test board)
- Zone to zone temperature isolation is greater than 60<sup>0</sup> C
- Access to the process chamber is accomplished via Powered Hood Lift actuators.

### Cooling Section

- Cooling is accomplished via fans with forced convection.
- Closed loop cooling control is available as an option.

## D. Conveyor System

| <b>Conveyor Belt</b>                 |  |  |
|--------------------------------------|--|--|
| Belt Width                           | 18 in.                                 | 45.7 cm                                |
| Material                             | 302 Stainless Steel Flat Flex          |  |
| Conveyor Speed Range                 | 10 - 60 in/min.                        | 25.4 – 152.4 cm/min.                   |
| Conveyor Speed Nominal               | 32 in/min.                             | 81.3 cm/min.                           |
| Product Clearance                    | 2 in. (3 in. optional)                 | 51 mm (76 mm optional)                 |
| Drive Motor                          | 1/16 hp / brushless DC                 |  |
| Conveyor Height from floor           | 33 - 39 in.                            | 839 - 991 mm                           |
| <b>Rail Edge Conveyor (optional)</b> |  |  |
| Material                             | #35 steel roller chain                 |  |
| Width                                | 2 – 18 in.                             | 5.1 - 45.7 cm                          |
| Support pin length                   | 0.187 in. (std)                        | 4.7 mm (std)                           |
| Pin to pin distance                  | 0.375 in.                              | 9.5 mm                                 |
| Support pin height (clearances)      | 1.2 in. above pin<br>0.8 in. below pin | 30.5 mm above pin<br>20.3 mm below pin |
| Rail parallelism                     | 0.040 in.                              | 1.0 mm                                 |
| Rail height from floor               | 33.8 in. – 39.8 in.                    | 859 mm – 1011 mm                       |

- Programmable (recipe controlled) width adjust is included with the *optional* rail edge conveyor.
- Programmable multi-port lubricator is included with the *optional* rail edge conveyor.
- Belt deviation detection via programmable deviation alarm.
- Belt “Stopped” alarm is standard with over torque protection provided via slip clutch.
- Alarm and motion messaging via WINCON™.

## E. Oven Controls

### Temperature Control

- Temperature control is accomplished by sixteen (16) PID control loops of the Oven Control Unit (microprocessor) and Windows™ WINCON™ operating software. Each zone is divided into independent top and bottom control. Temperature control accuracy is + / - .5° C no-load.
- Optional Cooling control is accomplished by varying blower speed. Cooling rate control is selected via WINCON™ software allowing the user to select the cooling rate.
- Process over temperature protection is accomplished via WINCON™ software using programmable alarm limits. Power to the heaters is removed if the temperature exceeds the high alarm limit.
- *Redundant independent electronic over temperature protection* is standard. In the event of an over-temperature condition, power to the heaters is removed and audible/visual alarm activates. The conveyor continues to operate in this condition.

### Operator Interface

- Controls are located on the **RIGHT HAND SIDE** as viewed from the oven entrance.
- The computer keyboard and flat panel display are located at the entrance front of the oven.
- Programming is accomplished via BTU's WINCON software. WINCON operates on the Windows™ XP platform.
- Thermal profiling can be accomplished using three dedicated thermocouple inputs located at the oven entrance. BTU is compatible with *KIC and ECD* as an integrated software solution.
- Four (4) Emergency power off buttons are provided, two (2) are located at the loading and two (2) at the unloading sections.
- A three color light tower to monitor the oven status is standard. Indicators are Red – Alarm condition, Yellow – Set-up or Alert condition and Green – Ready Condition.
- Smart Tracker provides an entrance and exit photocell, which senses product entering and exiting the oven. This allows the system to count products for a given recipe, detect product drop/lost and display a graphical view of the products. In the event of a product drop, an alarm will sound.
- Smart Tracker also manages the oven SMEMA ready/busy logic for up and downstream communications to other equipment in the assembly line.
- Automatic shutdown sequencing is standard.

## F. Atmosphere System

- The atmosphere system allows for operation in air.

## G. Utility Requirements (Electrical power based on std. Heater config. See Installation drawing for final power)

| Voltage               | Startup Power   | Operating Power                                    |
|-----------------------|-----------------|--|
| 208 3Ø / 3 wire       | 49 kW           | 14-17 kW   |
| 220 3Ø / 3 wire       | 54 kW           | 14-17 kW   |
| 230 3Ø / 3 wire       | 59 kW           | 14-17 kW   |
| 240 3Ø / 3 wire       | 65 kW           | 14-17 kW   |
| 440 3Ø / 3 wire       | 54 kW           | 14-17 kW   |
| 480 3Ø / 3 wire (STD) | 65 kW           | 14-17 kW   |
| 380/220 3Ø / 4 wire   | 54 kW           | 14-17 kW   |
| 400/230 Ø / 4 wire    | 59 kW           | 14-17 kW   |
| 415/240 3Ø / 4 wire   | 65 kW           | 14-17 kW   |
| Utility               | Supply Pressure | Maximum Flow Rate                                  |
| Exhaust Entrance      | 0.1 - .05 iwc   | 300 ft <sup>3</sup> /min / 8.5 m <sup>3</sup> /min |
| Exhaust Exit          | 0.1 - .05 iwc   | 300 ft <sup>3</sup> /min / 8.5 m <sup>3</sup> /min |

(NOTE: Consult final installation drawing for precise specifications. This is to be used a guide)

- Electrical values are estimated. Actual startup power may vary depending on oven configuration. Operating power is typical and dependent on product loading. Soft start power limiting is possible via WINCON™ software and should be specified at time of order.

## H. Physical Characteristics

- Standard Color: Pillar White
- Dry Weight: 3,800 lbs. / 1,727 kg
- Shipping Weight: Skid: 4,200 lbs. / 1,909 kg  
Crate: 4,500 lbs. / 2,045 kg

## I. Documentation

- System includes BTU's electronic documentation package, which is shipped on the oven PC and on Compact Disc. The package includes:
  - User Documentation
  - Maintenance Documentation
  - Troubleshooting and Repair Documentation
  - Part Identification Software
  - 1 Hard Copy manual