

## A. General Specifications

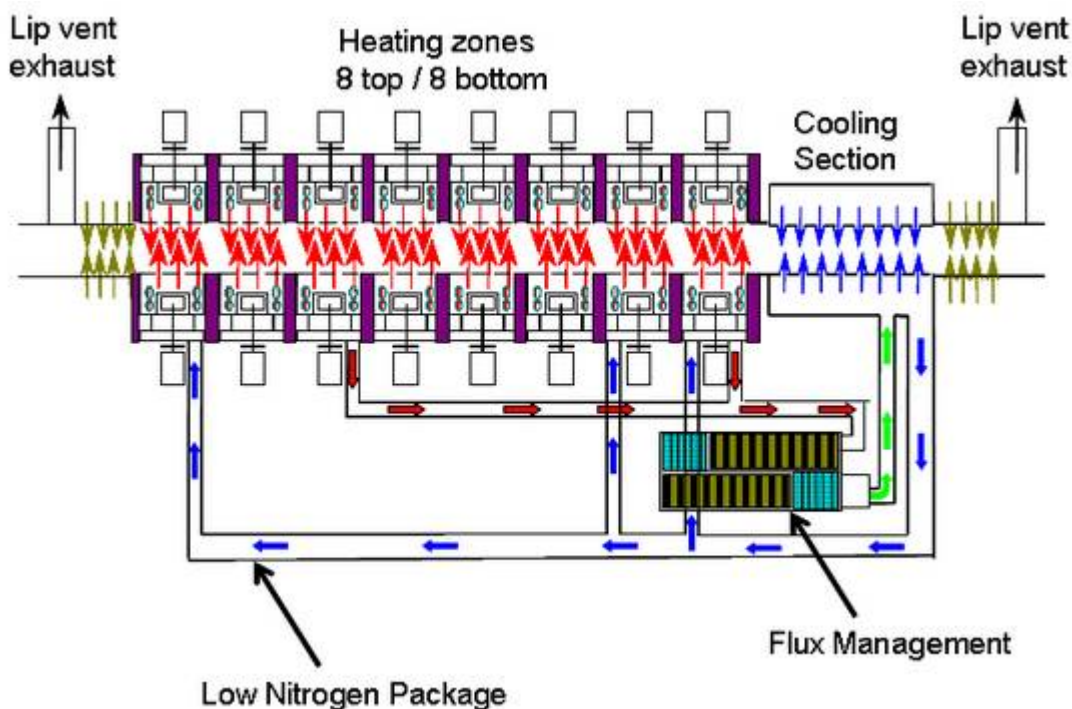
Maximum temperature rating (all zones):	350°C
Nominal operating temperature:	80-350°C
Number of controlled heated zones:	8 Top 8 Bottom
Oven atmosphere:	Air/N <sub>2</sub>
Working dimensions:	
Conveyor belt	457 mm
Product clearance (standard).	50,8 mm
[Other clearances available]	(+30,5/-20,3)



## B. Dimensional Layout



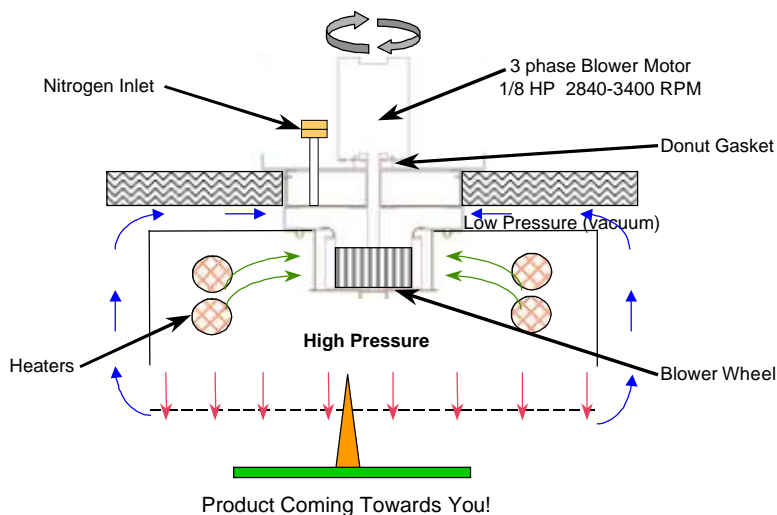
Description	mm
Entrance, Lip Vent Exhaust and Inert Baffle Curtain	660
Zone 1	318
Zone 2	318
Zone 3	318
Zone 4	318
Zone 5	318
Zone 6	318
Zone 7	318
Zone 8	318
<b>Total Heated Length</b>	<b>2540</b>
Cooling Transition Vestibule	76
Cooling Zone (Top and Bottom)	712
Exit, Inert Baffle Curtain and Lip Vent Exhaust	660
<b>Total System Length</b>	<b>4648</b>
<b>Total System Width</b>	<b>1524</b>
<b>Total System Height</b> (Assumes 914 mm Hearth Line)	<b>1524</b>



## C. Process Chamber

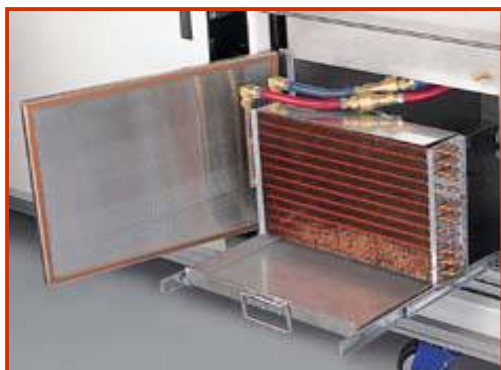
### Heating Section

- 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 10 kg/m<sup>2</sup> based on a nominal conveyor speed of 80 cm/min. With optional 5kW heaters in all zones the loading capacity increases to 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 457 mm wide. 610mm board capability is available as an option.
- Cross belt temperature uniformity is within a +/- 2°C delta T in the reflow zone (using standard BTU uniformity test board).
- Zone to zone temperature isolation is greater than 60°C between zone 6 and zone 7 transition.
- Access to the process chamber is accomplished via Powered Hood Lift actuators.



### Cooling Section

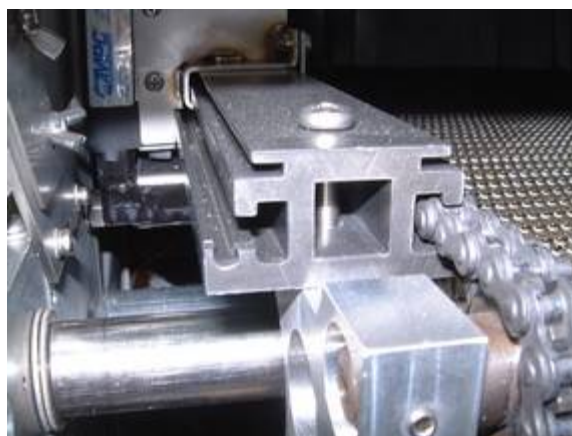
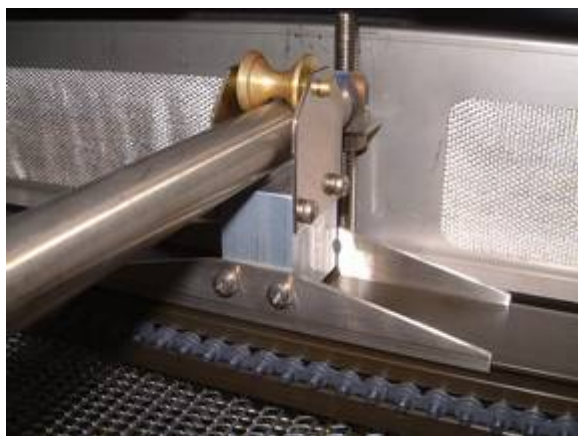
- Two (2) cooling zones are provided (1 top / 1 bottom). Four cooling zones are optional.
- Cooling is accomplished via top and bottom forced convection cooled by a water heat exchanger.
- Cooling Water Flow Fail Alarm and water detection are standard.
- Closed Loop cooling control is available as an option.
- Access to heat-exchangers is very easy and parts can be removed within minutes



## D. Conveyor System

<b>Conveyor Belt</b>	
Belt Width	457 mm
Material	302 Stainless Steel Flat Flex
Conveyor Speed Range	25,4 – 152,4 cm/min.
Conveyor Speed Nominal	80 cm/min.
Product Clearance	51 mm (76 mm optional)
Drive Motor	1/16 hp / brushless DC
Conveyor Height from floor	839 - 991 mm
<b>Rail Edge Conveyor (optional)</b>	
Material	#35 steel roller chain
Width	51 – 457 mm
Support pin length	4,75 mm (std) 9,5 mm and others available on request
Pin to pin distance	9,5 mm
Support pin height (clearances)	30,5 mm above pin 20,3 mm below pin
Rail parallelism	+/- 0,5 mm
Rail height from floor	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 +/- 0,5°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 Pro platform.
- Thermal profiling can be accomplished using the three dedicated thermocouple inputs located at the entrance of the oven. 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 four color light tower to monitor the oven status is standard. Indicators are Red – Alarm condition, Yellow – Set-up or Alert condition, Green – Ready Condition and Blue – N2 on.
- 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

### Gas Distribution System

- The atmosphere system allows for operation in either air or nitrogen atmospheres. Process gas is delivered via flow meters located at the front exit area of the oven.

Qty.	Location
1	Entrance Curtain Top/Bottom
1	Zone 1 Top/Bottom
1	Zone 5/6 Top/Bottom
1	Zone 7/8 Top/Bottom
1	Cooling Zone
1	Exit Curtain Top/Bottom

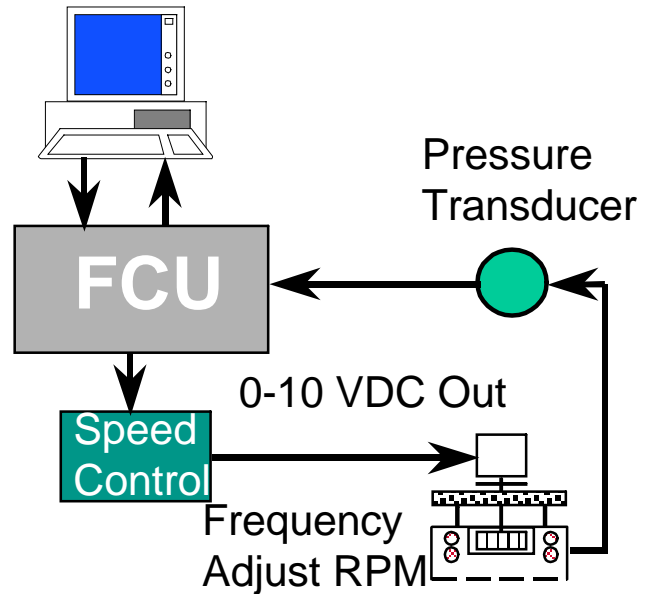
- Nitrogen containment capability  $\leq 50$ ppm above source gas purity in the heated section. The cooling section containment to  $\leq 100$ ppm above source gas purity.
- A dual atmosphere inlet provides programmable switching between process gas atmospheres. This is accomplished via the WINCON software and gas solenoid valves, which switch between the selected process gas of air or nitrogen.
- A nitrogen gas idle mode reduces N2 consumption when the oven is not running product.

## G. Lead-Free Soldering

All Pyramax reflow solder ovens are Lead Free compatible as standard. The Pyramax's high efficiency heat transfer characteristics provide more than sufficient scope to process all popular lead free pastes. BTU's experience in high temperature furnaces has proved invaluable in developing the optimum engineering technology to ensure that both materials used and design parameters are compatible with robust and continuous production at elevated soldering temperatures.



In order to provide a fully closed loop control of the process BTU have developed a unique (optional) feature: - Closed Loop Blower Speed Control. This option was developed for various applications such as flip chip, BGA, CSP, 0201, lead-free, etc... With this option the convection rate is programmable and continuously monitored and controlled. It is a lot easier with this option to maintain the profile in the tighter process window dictated by the lead-free solder pastes.



### H. Flux Management System (Optional)

The Pyramax 100N reflow solder oven features the new high efficiency Tandem flux manager system. The tandem features dual water-cooled heat exchangers, which collect twice as much flux as conventional systems, the additional gas cooling effect provided by the secondary heat exchanger allows the tandem to extract flux constituents, which elude other systems. The high volume flux removal trays can hold 100% more collected flux than earlier models, providing a significantly extended maintenance Interval.

In order to provide a maximum “Uptime” of the Pyramax systems the Flux Management system can be cleaned during production without disturbing the temperature profile and the atmosphere. The new filters catch the smaller particles and reduce significantly the residues in the cooling zones.



### I. Utility Requirements (Electrical power based on std. Heater configuration. See Installation drawing for final power). Other voltage requirements available on demand.

Voltage	Startup Power	Operating Power
380/220 3Ø / 4 wire	54 kW	14-17 kW
400/230 3Ø / 4 wire	59 kW	14-17 kW
415/240 3Ø / 4 wire	65 kW	14-17 kW
Utility	Supply Pressure	Maximum Flow Rate
Nitrogen	4 Bar	30 m <sup>3</sup> /hr
Water Supply	2 Bar	15 lpm
Exhaust Entrance	0,1 – 0,05 iwc	510 m <sup>3</sup> /h (typical 300 m <sup>3</sup> /h)
Exhaust Exit	0,1 – 0,05 iwc	510 m <sup>3</sup> /h (typical 470 m <sup>3</sup> /h)

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

- Electrical values are estimated for full load. 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.
- All utility values must be finalized at time of order. A detailed installation drawing is provided once final configuration is established.

## J. Physical Characteristics

- Standard Color: Pillar White      Shipping Weight: Skid: 2.365 kg
- Dry Weight: 2.140 kg      Crate: 2.640 kg

## K. Documentation

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

## L. CE MARK

The furnace complies with following CE standards and directives:

EN292-1 / 1991	Safety of machinery - Basic concepts, general principals for design, Part 1: Basic terminology, methodology.
EN292-2 / 1991	Safety of machinery - Basic concepts, general principals for design, Part 2: Technical principals and specifications.
EN60204-1 / 1997	Safety of machinery – Electrical equipment of machines.
EN50081-2 / 1993	Electromagnetic compatibility - Generic emission standard.
EN50082-2 / 1995	Electromagnetic compatibility - Generic immunity standard.
EN55011 / 1998	Limits and methods of measurement of radio disturbance characteristics of industrial equipment.

Following the provisions of Directives:

73/23/EEC	Low Voltage Directive- with Amendments: 93/68/ECC, OJEC No. L220, 30 August 1993
2004/108/EC	EMC Directive
98/37/EC	Machinery Directive with Amendments: 98/79/EC, OJ 331, 12 July 1998

CE plate is applied and CE certificate is included.