

# Standard Configuration



Wire Bonder 3100

W100000 / Issue 07/04

## Features & Benefits

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### TY Technology Bondhead

- TY-technology bondhead
  - Frictionless air bearing and voice coil motors
  - Direct optical position measurement system
  - Integrated, real time dynamic force control
  - Extended bond range
- > accuracy at high speed through revol. design
  - > wear free, no maintenance
  - > high accuracy over lifetime
  - > low impact, no cratering
  - > large devices, matrix applications

### Human Machine Interface

- User optimized keypad with ergonomic design
  - Popular trackball-mouse handling
  - Easy setup → Direct access to 90% of production and assist functions
  - Alphanumeric keyboard as standard accessory
- > optimal operator support
  - > fast and easy handling
  - > fast familiarizing (icon based labeling)
  - > Easy m/c access for senior operators

### Graphical User Interface

- Interactive online help and documentation
  - One screen concept
  - Easy mouse navigation
  - One screen concept
  - Multi language capability
  - Live videos
  - Based on Sematech GUI Style Guide
- > direct access to main functions
  - > Economy of space, less spare parts
  - > user friendly and easy to operate
  - > improved and shortened learning cycles
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  - > better know how on the operator level
  - > Standardised m/c according SEMI

### Bond Process

- Dynamic impact measurement and control
  - Intelligent non stick detector (chip and lead)
  - Closed loop US measurement
  - 125kHz US frequency
  - Statistical Process Control (SPC)
- > enhanced speed and UPH
  - > improved placement accuracy
  - > diagnostics tools for optimization
  - > improved looping algorithms

### Pattern Recognition System

- PatMax® based teach and search algorithms
  - Auto teach functions
  - Retry algorithms with alternative references
  - Ball size and position measurement
  - Measurement while bonding
  - Programmable focus
- > high reliability, high speed
  - > fast conversion, high accuracy
  - > high MTBA
  - > high yield, highly reliable process
  - > real time measurement
  - > optimal productivity

### Calibration Concept

- Mechanical, illumination, force and US calibration
  - Separation of calibration data and teach parameters
  - Recipe transfer via host or 3.5" floppy disk
  - Step by step calibration visualizing by video-animation
- > same process window on all machines
  - > recipe portability, fast conversion time
  - > duplicate recipe on other machines
  - > better know how level of engineers

### **Programmable Indexer**

- Single Clamp Concept
- Fully programmable automated indexer
- Programmable downholder / progr. heater
- Snap-in downholder / Snap-in heater
- Downholder plate X/Y adjustment
- Integrated flex heater interface
- 3 individually programmable heater zones
- Automatic teaching of the indexer

- > less substrate deformation
- > fast conversion time
- > easy handling
- > high process control
- > easy teaching
- > flexible heat distribution
- > easy to operate

### **Hardware**

- Industrial PC - Pentium 4 (2GHz)
- Color LCD TFT monitor-15.2"
- DVD drive
- 512MB DDR-RAM
- LAN - Intel 82562EM

- > proven technology
- > host connection
- > familiar environment - easy to use
- > easy expandable

### **Automation capability (optional, EQC)**

- SECSI+II/GEM compliant host interface
- HSMS

- > advanced host communication
- > reduced operator handling
- > operator independent, high repeatability

## Specifications

### Flying Bondhead:

- Bond placement accuracy:  $\pm 2.5\mu\text{m}$  (3 sigma)
- Sprint UPH: 17 wires/second  
UPH depends on material / process requirements
- Max. bonding area: 52 x 70mm/ 2 x 2.7"

### Indexer:

- Process zone temperature: ambient to 300° C
- Pre-bond temperature: ambient to 250° C
- post-bond temperature: ambient to 200° C
- All 3 zones are individually software controlled
- Pre-/ post-bond heater plates  
standard widths: 8/23/44/60 mm  
0.31/0.90/1.7/2.4"

### Wire:

- Spool diameter: 50.8mm / 2"
- Spool width: 20 to 50.8 mm / 0.8 to 2"
- Windings: Single or multi layer
- Gold wire diameter:  
Standard: 17.5 to 50 $\mu\text{m}$  / 0.7 to 2.0mils  
On request up to 75 $\mu\text{m}$  / 0.7 to 3.0mils

### Capillary:

- Length: 11.1mm / 0.437"
- Diameter: 1.58mm / 1/16"

### PRS System:

- Chip alignment 2 points: <110ms
- Leadframe alignment 2 points: <110ms
- Finger alignment: <2ms/ finger  
(304 lead)

### Looping:

- |  | Height:  | Height variation ( $\sigma$ ): |
|--|--|--------------------------------|
| Flat loop:                                   | 100 to 150 $\mu\text{m}$<br>4 to 6 mils                              | < 8 $\mu\text{m}$<br>< 0.3mils |
| Standard loop:                               | 100 to 300 $\mu\text{m}$<br>4 to 12mils                              | < 8 $\mu\text{m}$<br>< 0.3mils |
| Typical data TSOP:<br>(wire length 2 .. 3mm) | 140 $\mu\text{m}$  | 6 $\mu\text{m}$                |
| Typical data QFP:<br>(wire length 3 .. 4mm)  | 200 $\mu\text{m}$  | 8 $\mu\text{m}$                |
| Max. wire length:                            | 9mm / 360mils  |                                |
| Wire straightness:                           | <1% of wire length<br>(looping depends on leadframe and chip design) |                                |

### Magazine Handling:

- Magazine gripper with self-adjusting clamps
- Magazine width, height, position and number of slots programmable
- Tunnel Buffer system

### Buffer Capacity Magazine Platform:

- Typically 4 magazines for QFP 84 L/F
- Loading/unloading platform dimensions:  
Width (adjustable): accepts magazines with a length from 125mm / 4.92" up to 275mm / 10.82"

### Standards / Safety:

- EC Conformity (CE Mark), includes safety regulations
- SEMI S2, S8 compliant
- Clean room class 10'000

## Miscellaneous:

- Size (w x d x h): 850 x 960 x 2'010mm / 33.5 x 37.8 x 79.1"  
max. width: (if largest possible magazine used) 1100mm / 43.3"
- Weight: Approx. 590kg
- Electrical: 204/230V  
100-120V (on request)  
+10% -10%, 50 to 60Hz.  
Max. 2'900W / typical 1200W
- Compressed air: 5 - 8bar / 73 - 116psi
- Air consumption: Max. 65nl / min (at p = 5 bar)  
Max. 230nl / min with optional Venturi valves for vacuum generation
- Air quality: Max. 1.4g/m<sup>3</sup> (SPT) water contamination  
Max. 0.1mg/m<sup>3</sup> (SPT) oil cont.  
Max. 5mg/m<sup>3</sup> (SPT) particles  
Max. particle size 5µm
- Vacuum: -0.8 to -0.95bar / 24 to 29" Hg  
Typ. 15nl / min
- Vacuum tank: 1.5L volume
- DVD drive:
- Ambient conditions according IEC 721-3-3, class IEC32 with deviations during operation:
  - max. temperature drift  $\pm 2.5^{\circ}\text{C}$
  - max. temperature:  $+30^{\circ}\text{C}$
  - min. temperature:  $+15^{\circ}\text{C}$
- Noise level: <75 dB

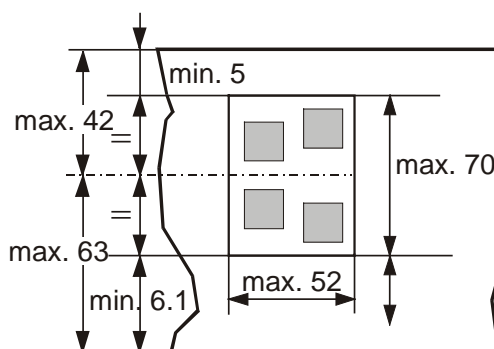
## Materials:

### Leadframe:

- Length: 100 to 270mm / 4.0 to 10.63"
- Width: 15 to 84mm / 0.6 to 3.3"  
84 to 115mm on request
- Thickness: 0.1 to 0.8mm / 4 to 32mils  
standard  
0.8 to 1.6mm / 31 to 63mils  
(on request)
- Pad downset: 0.1 to 2.3mm / 0.4 to 90mils
- Max. pitch: 90mm / 3.5"
- Max. Bond area: 52 x 70mm (x/y)

### Magazines:

- Length: 125 to 275mm / 4.92 to 10.82"
- Width: 20 to 120mm / 0.78 to 4.7"
- Height: 50 to 180mm / 1.97 to 7.08"
- Weight: Max. 4 kg / 8.8lbs
- Magazine type: Open on both sides



### Note:

- The magazine must not be more than 25 mm (0.78") longer than the leadframe

## Description

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### TY Technology Bondhead

- Air bearing rotating bondhead
- Voice coil motor concept
- Optical measurement system
- Programmable linear wire clamp
- Bond range of 52x70mm
- Fixed electrode blade
- ESEC's 125 KHz transducer system

### Magazine Handler

- Front magazine handling system
- Pneumatic robotic magazine handler
- Programmable magazine size and slot counts
- Ergonomic load/unload platform
- Large storage capacity

### Tunnel Buffer System

- Automatic transfer of empty magazine from input to output magazine handler

### Single Clamp Indexer

- Single clamp concept
- 3-axis strip handler system with linear stepper motors on air bearing
- Fully programmable indexing system for different types of leadframes
- Toolless leadframe conversion
- Leadframe incoming orientation check
- Corner push-in system
- Push-out system with ejector-flag

### Downholder / Heater System

- Programmable heater height to ensure orthogonal capillary impact on bond-zero
- Programmable downholder clamp force
- Integrated flex heater interface
- Snap-in downholder clamp
- Heaterplate X/Y adjustment
- 3 independent heater zones
- Snap-in heater plates

### Non-Stick Detector

- Automatic self-teach procedure
- Non-conductive pad detection

### Optical Transducer Calibration

- Calibration of ultrasonic system

### Programmable Focus

- One focus level for each reference system with voice coil motor on air bearing

### Pattern Recognition System Pat Max®

- Leadframe, chip, lead finger alignment
- Auto-teach function for finger and pad alignment
- Automatic finger centering function with programmable tip distance
- 2-dimensional finger alignment for various lead shapes
- Automatic pad centering function
- Measurement of ball size and position
- Real-time and post-bond inspection
- Non chip detection

### Human Machine Interface

- User optimized keypad with ergonomic design
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### Graphical User Interface

- One screen concept
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### Wire Supply System

- $\leq 50\mu\text{m}$  diameter wire handling
- End of spool detection

### Bond Process Analyzer

- Monitors real-time impact
- Statistical process control of machine performance
- VBI Visual Bond Inspection
- CLPC - Closed Loop Placement Control

**Statistical data collection**

- RTC and SPC

**Microscope**

- Adjustable focus
- Adjustable X/Y position
- Magnification 9.5 - 42

**Documentation and Tools**

- Manuals on HMI Info-page:
  - Basic information
  - Service & Maintenance manual
  - Installation and de-installation information
  - Spare parts catalogue
- Manuals on hard copy:
  - Basic information
  - Installation and de-installation information
  - Unpacking and installation
- Manuals on CD:
  - Spare parts catalogue
- Manuals on request:
  - Service & Maintenance manual

**Crate**

- Machine packed in protection foil, evacuated

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**Available Options:**

- Ball Bumping (BABU)
- Bond Position Import (BPI)
- Equipment Connectivity (EQC)
- Venturi Valve Assembly (VV4)
- Multi Language (ML)
- Power Loss Protection (PLP)
- Training
- Installation

**Additional requirements**

- Downholder set (leadframe drawing required), including:
  - Downholder clamp
  - Process heater plate

**Other available accessories:**

- Downholder sets
- Capillaries
- Gold wire
- Calibration tools:
  - Optical Transducer Calibrator (OTC3)
  - Calib tool Case (CTC1)
- Maintenance tools:
  - Maintenance tool Case (MTC1)
  - Torque screwdriver for capillary screw (TSC)
- Various:
  - Dongle
  - Eyepiece glass for inspection microscope (EYP)