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Bonder Description

The 3700*Plus* is a single-head, large-area wedge bonder designed for small-wire applications [25 - 75 μm (1 - 3 mils) in diameter] mainly in the hybrid automotive and power module markets.

The bonder has dual operating systems that are internally Ethernet connected. DataManager, the bonder-control software, is a real-time operating system, and Microsoft Windows® XP, the operator interface software, allows communication with other bonders and computers.

NOTE:

This guide is meant to help Orthodyne factory-trained personnel operate a 3700*Plus* bonder. Do not operate a bonder if you are not properly trained to do so.

3700*Plus* Specifications

This section gives brief descriptions of the general and technical aspects of the bonder.

Motion Systems

Bond Area	150 mm (Y) x 250 mm (X), 0.1 μm table resolution
Z Axis	50 mm Z - stroke, 0.5 μm resolution
Theta Axis	$\pm 220^\circ$, 0.00352° resolution
Programmable Focus	Z-axis range, 0.5 μm resolution

User Features

Microscope	Stereo zoom with adjustable work distance
Monitor	17-inch color flat panel
Work Height	1000 mm from the floor (nominal), adjustable (934 - 1050 mm), meets SMEMA requirements (940 - 965 mm)

Bondhead

Type	Orthodyne rotary; low mass; deep access
Tear and Feed	Programmable clamp tear, optional table tear
Bond Force	10 - 200 g, ± 1 for force settings < 50 g; $\pm 2\%$ for force settings > 50 g; 1 g programmable resolution
Transducer	Orthodyne miniature; 120 kHz
Bondtool	0.062 in x 30.5 mm long
Positioning Referencing/ Touchdown	Linear encoder with 0.1- μ m resolution
Wire Feed Angle	45° or 60° angles (contact Orthodyne for a full set of clearance specifications)

Wire Handling

Wire Range	25 - 75 μ m (1 - 3 mils) in diameter
Wire Feed	Motorized dereeler with an optical encoder
Missing Wire Detection	Wire deformation monitoring
Wire Spool Size	60 mm OD, 26 - 55 mm Width, 49 mm ID

Pattern Recognition

Vision System	Enhanced Orthodyne GSIII pattern recognition
Optics	Option 1: (1.5x): 2.4 mm (H) x 1.8 mm (V) field of view; option 2: (2.3x): 1.6 mm (H) x 1.2 mm (V) field of view
Lighting	Homogenous area lighting, programmable bondhead illumination with co-axial and direct lighting
Die rotation	$\pm 7^\circ$ from nominal for single- and dual-point modes; $\pm 20^\circ$ from nominal for edge mode

Control and Interface

CPU	VME PowerPC for Real-Time System (RTS); CPCI Pentium III for DataManager
File Storage	Hard disk, CD-RW
Communication Ports	Ethernet, USB, printer; optional SECS-GEM interface, serial port
Discrete I/O Lines	Standard: 32 lines, expanded: up to 64 lines (optional); two 32-line ports available on the front panel
Operating System	VxWorks for Real Time Function, Windows XP for graphical user interface (GUI)

Process Programs

No. of Bonds/Program	5000
No. of PR Strategies	250

Installation Requirements

IMPORTANT: Overcurrent protection must be provided for the bonder. Orthodyne suggests a trip current of 10 amps.

Primary Power	The input power cable must be filtered and overcurrent protected before connecting it to the bonder; must meet or exceed 230 VAC at 5 A with 5 kA interrupting capacity.
Power Requirements	180 - 240 VAC, single phase, 50/60 Hz line conditioner included
Power Consumption	4A at 230V
Nitrogen Supply	2 - 4 L/minimum @ 40 - 145 psi
Vacuum	Vacuum generated by air pressure and a Venturi nozzle
Weight	430 kg (946 lb) uncrated
Operating Temperature	12° - 35° C
Operating Relative Humidity	30% - 80%
Max Workholder Weight	50 kg (110 lb)
CE Certification	Standard
Factory Floor Space	Min. floor space: 814 mm W x 1345* mm DMax. floor space: 814 mm W x 1710** mm D *Electronics cabinet drawer (front) in and card cage (rear) closed; **Electronics cabinet drawer out and card cage open; contact Orthodyne for a complete Outline Dimensions drawing if needed

Transportation and Storage	<p>Before transport/storage, recreate the bonder (see Crating and Uncrating Instructions, D-73729). Use commercial movers who meet/exceed:</p> <ul style="list-style-type: none"> • Shipping space: 168 W x 122 D x 203 H cm (48 W x 48 W x 80 H in = 122.5 sq ft) • Temperature: -10 to 60°C (14 to 140°F) • Relative humidity: 10 - 85% • Altitude: 3719 m (12,200 ft) maximum
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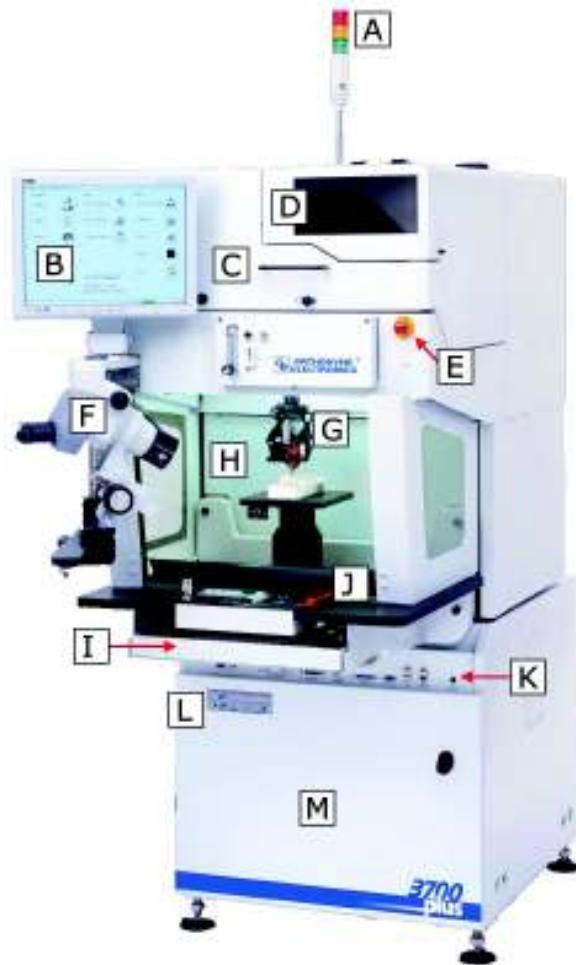
Options

Lift Kit	Raises the bonder assembly and increases its working distance
Expanded I/O Lines	Full XMI - 64 lines
BPM	Bond process monitor
Casters	Frame with wheels to move the bonder
SECS/GEM	Remotely integrates a bonder into an automated factory operation; the SECS (SEMI Equipment Communications Standard) interfaces with a host computer; the GEM (Generic Equipment Model) defines the equipment behavior during the interface.
GBS (Graphical Bondhead Setup)	<p>The GBS is a configurable optical option installed in the bonding area. The camera displays an image of the bondtool, cutter, and wire guide on the monitor so you can:</p> <ul style="list-style-type: none"> • see the bondtool, cutter, and wire guide from the side or bottom • use the default graphics sets as guides to adjust the cutter and wire guide positions in relation to the bondtool

Bonder Components

This figure identifies the basic parts of the bonder.

3700Plus Bonder



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|-------------------------------|-----------------------------|
| A Status light tower (option) | H Safety work enclosure |
| B LCD monitor | I Keyboard |
| C Motion system enclosure | J Control panel |
| D Small-Wire dereeler | K Interface connector panel |
| E Emergency-stop button | L CD-RW drive |
| F Microscope | M Main electronics cabinet |
| G Large-wire bondhead | |

Small-Wire Bondhead Components

The small-wire bondhead uses 25- to 75- μm (1- to 3-mil) diameter wire. This bondhead does not cut the wire after a bond. Instead, its clamp grip the wire, and the tear-and-feed axis moves and breaks the wire.