

**Model 4KE / 4KEH Series: Semi-Automatic, Motorized Y/Z Axes, Wedge-Wedge, Ball-Wedge Triple-Convertible Wire Bonders**

*Last revised: 01/16/2015*

*Series Overview*

Application and Function:

Series 4KE models are three-way convertible Semi-Automatic wire bonders of a gantry design. The entire mechanism is arrayed above the work plane, so that it is wide open to accommodate different size and style of work packages. Two-axes X and Y are driven manually by unique West-Bond micro-manipulator for positioning. Microprocessor controlled W (in Y direction) and Z axes are driven by program controlled motors to arch the connection. It is capable of creating a series of parallel, single or multiple arched wires while maintaining identical loop and bond shapes. Cross roller bearings rigidly guided axes are moving orthogonally, with independent pneumatic brakes in X and Y applied on signal. Target the critical bond location manually with the manipulator via moving the crosshairs generated on the screen and image captured from vertical view CCTV camera, then the target will be secured by the brakes to proceed with programmed bonding.

A dual force mechanism, operated pneumatically, acts to change between two pre-set force values, and either high or low force may be programmed for any bond. Radiant tool heat with panel mounted, controlled by constant current.

With simple exchange of clamp assemblies, bond tool, and wire path provided with the software mode will allow quick conversion between conventional 45° wire feed, deep access wire or ribbon, ball bonding, insulated wire and single point tab / lead bonding. All programmed bond variables as well as machine settings for each bond mode are retained in the machines memory.

Programming and Interface:

1. *Keypad.* Twelve-key pad for entry of program data, setting of Modes, and direct control of machine actions. All machine configuration constants and bond settings are programmable at the machine panel, prompted by a series of "screens" displayed on a 4-line 40-character LCD.
2. *X-Y Manipulator.* Moves tool head, TV camera, and motorized slides atop X-Y-Axes with 8/1 mechanical advantage.
3. *Ball Button.* Push-button switch in the manipulator control ball. Parallels the G Key but also acts to lock only the X-Axis for scanning the bond path along the Y-Axis, front-to-back.
4. *Modes of Operation.* Monitor or Microscope Modes; Fully-auto or Semi-auto modes; Inch mode.

*Definitions of Models of this Series*

<b>4KE</b>	<b>Low Frequency (63kHz) Wedge-Wedge and Ball-Wedge Bonding Machine come with Standard -79 Adjustable Height Working Platform.</b>
<b>4KEX</b>	<b>Low Frequency (63kHz) Wedge-Wedge and Ball-Wedge Bonding Machine specified as Model 4KE without Base or Working Platform.</b>
<b>4KEH</b>	<b>High Frequency (110kHz) Wedge-Wedge and Ball-Wedge Bonding Machine come with Standard -79 Adjustable Height Working Platform.</b>
<b>4KEHX</b>	<b>High Frequency (110kHz) Wedge-Wedge and Ball-Wedge Bonding Machine specified as Model 4KE without Base or Working Platform.</b>

## *Mechanical*

Ultrasonics:	
Frequency	63 kHz (Model 4KE Series), 110kHz (Model 4KEH Series)
Time	up to 999 ms; programmable
Power	Low Power:2.5 Watts; High Power 4 Watts; programmable
Bond Force:	10 – 250 grams; (High / Low programmable)
Bond Tool:	
Diameter	1/16"
Length	0.625" capillary, 0.750" 45 & 90 degree wedge (Model 4KE Series) 0.750" capillary, 0.828" 45 & 90 degree wedge (Model 4KEH Series)
Tool Heat:	Adjustable radiant heater
Wire Clamps:	
Actuation	Air opened / spring closed
Adjustment	X/Y/Z position; clamp force (through change of spring); opening gap
Bond Wire:	
Size	Au / Al: 0.7 to 3 mil Ribbon: 0.5x2 to 1x10 mil Au Ball Bonding: 0.7 to 2 mil Cu Ball Bonding: 0.7 to 1.5 mil (Special Wire Clamp Assemblies required for wire size above 2 mil or ribbon)
Spool	1/2" diameter Standard, 2" Optional
X/Y/W/Z:	
X axis	Manual; 8 : 1 reduction; 0.625" travel
Y axis	Manual; 8 : 1 reduction; 0.625" travel
W axis	Motorized; 0.500" Travel; 0.150" Forward, 0.350" Rearward from Target Point; 0.000208" resolution
Z axis	Motorized; 0.500" Travel; 0.000208" resolution
Brakes	X and Y axes
Max. Bond Span:	0.349"
Work Elevation:	5.00" nominal above tabletop, actual work elevation vary with different tool configurations

## *Electrical Software and Hardware*

Process Control:	West-Bond Part No. 8750 CPU w/ Motorola 68000 microprocessor, 512 KB of Battery Back-up RAM; Data Entry by 12-Key Key Pad via LCD Display; Bond Targeting by Cross Hair Generator via 15" LCD Monitor and CCTV
Program Buffers:	40 Device Buffer with 30 Types; up to 5 bonds per wire, individual power, time and loop control data per wire type.
Display:	4-line, 40-character LCD

### *ESD Protection*

Protection against Electrostatic Discharge is implemented by finishing exposed tool assemblies and other moving parts by Electroless Nickel plating, which is conductive; and all exposed painted parts with a powder-coated paint that is dissipative (1 - 10 MΩ).

### *Machine Configuration*

Microscope:	Olympus SZ51-60E or Nikon SMZ660 (recommended; not included)
Illumination:	"Luxuray" #10265.00 or #10265.01 (recommended; not included)
Bond Tool:	(1) 1 mil, capillary, (1) 1 mil, 45 degree wedge & (1) 1 mil, 90 degree wedge tool (included)
Work Holder:	Workholders are not included, and are priced separately. A large number of previously designed special work holders are available. Those with Status of <i>Current</i> can be selected for delivery in the same time span as the machine, while those of Status <i>Available Not Stocked</i> must be ordered separately. Workholders for new work pieces requiring custom design and fabrication will be quoted upon receipt of drawings and samples: These must be ordered on separate purchase orders.
Temperature Controller:	West-Bond K~1200D / 1201D (recommended; not included)

## *Options Available for this Series*

- K~1100: Automatic Wire Despooler**  
Pays out bond wire at 1.0 in. /sec. from ½ in to 2 in. wire spool. Maintains constant slack with zero drag. Announces end of wire stock.
- 72E: External View TV Camera**  
Color external view TV camera with magnification adjustment within a range of 30X to 55X. Flat screen monitor & power supply included.
- 4141.008: Spool Mount, 2" Nickel Plated, Used "A, C, D, 4KE & 5KE" Series Machines (ESD)**  
Spool Mount: Universal 2" dia. spool mount, is housed into a Nickel plated aluminum enclosure. The wire is fed through a 6" long Stainless Steel funnel, which serves as a wire guide.
- 9048.004: Assembly, Clamp Blade 45°, 4 Mil Wire, Models "D", "E"**  
45° Feed Clamp Blade Assembly to hold 2 to 3 mil wires.
- 9049.003: Assembly, Clamp Blade 90° 1/2-1Mil x 1-5 Mil Wide Ribbon, Model "D", "E"**  
90° Vertical Feed Clamp Blade Assembly to hold ½ to 1 x 1 to 5 mil ribbon.
- 9049.004: Assembly, Clamp Blade 90°, 1/2-1Mil x 6-10 Mil Wide Ribbon, Model "D", "E"**  
90° Vertical Feed Clamp Blade Assembly to hold ½ to 1 x 6 to 10 mil ribbon.
- 9221: 20" x 20" Platform with extended manipulator arm. Model 4KE & 5KE Series**  
Extra-large 20" x 20" Work Platform Assembly with extended manipulator arm.
- 9221.001: 20" x 20" Platform with extended manipulator arm, Extra 1" Risen, Model 4KE & 5KE Series**  
Extra-large 20" x 20" Work Platform Assembly with extended manipulator arm. Extra 1" Risen.
- 9221.002: 20" x 20" Platform with extended manipulator arm, exclude Legs, Model 4KE & 5KE Series**  
Extra-large 20" x 20" Work Platform Assembly with extended manipulator arm. Exclude Mounting Legs.
- 10600.xx: Assembly, Machine Spacer Block**  
Spacer block kit for shimming machine up to specific height requirements. Check for different height specification available.
- 11067: Thin Clamps Assembly, 45° Guide, Model "E"**  
45° Feed Clamp Blade Assembly with exceptional back and side clearance to hold 1 to 1.5 mil wires.
- 11630.01: Adapter Kit, Inert Atmosphere for Cu Ball Bonding , Model 4KE**  
Attachment to provide Inert Atmosphere to protect the Cu Ball formation from oxidation.

### *Services Required*

Compressed Air: 50 psi; clean dry air  
Regulating valve & pressure gauge provided. Connection is via 1/4-inch tubing.

Vacuum: 22 in/Hg min. (Required if equipped with Vacuum Clamping Workholder)

Electrical: 50-60 Hz, single-phase, either 115 VAC or 230 VAC; selected automatically. A fuse and three-prong power cord connector is provided for 115 VAC: For 230 VAC, these must be changed to conform to local requirements.

### *Weights & Dimensions*

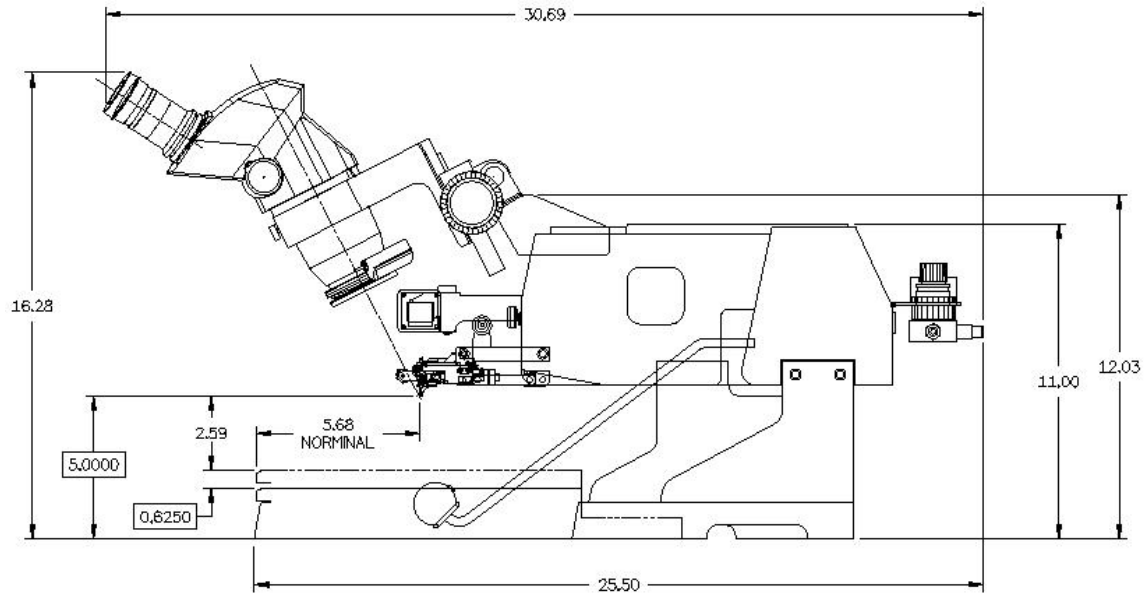
Uncrated: 75 lbs; w/o platform

Crated: 165 lbs; w/ accessories

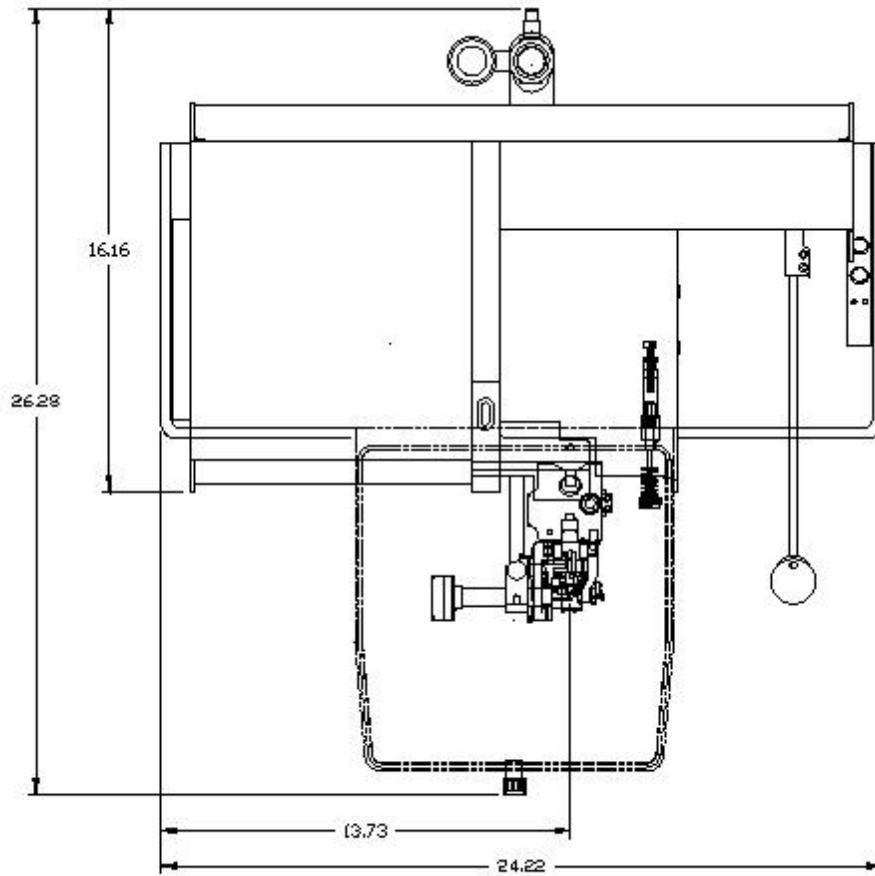
Overall  
Dimensions:

Width	24.22"
Depth	25.05"
Height	12.03" w/o microscope

*Dimensional Drawings*



**SIDE VIEW  
WEST.BOND MODEL 4KE WIRE BONDER**



**TOP VIEW  
WEST.BOND MODEL 4KE WIRE BONDER**