

TPT HB16 Wire Wedge & Ball bonder

Current and the most used settings of the instrument:

Wedge 25 µm tool, 25 µm Gold wedge bonding wire, ThermoSonic method

For using the other bonding tool or wire contact, please, guarantee of the instrument Zuzana Lišková (ball bonding, AlSi wire available).

Before starting:

Sample preparation – Assure a good adhesion of metal contacts to the substrate and horizontal position with good adhesion of the sample to the chip package/expander is necessary for successful wire bonding.

Place the work stage holding a sample in chip package on the work platform, but **not** below the bonding tool until a program is chosen. Set a suitable working distance by adjusting the stage bottom (use locking screw to lock the position).

Instructions for use:

- Switch on the wire bonder machine – the I/O switch is located on the back side on the left
- Choose your program – double click on the **program number**, specify a number.

(For copying of existing program go to the **ADV. SETTINGS**, **MISC**, **SAVE AS**. Then set a new program number, write down the number and your name to the table.)
- Select a method – manual x **semiautomatic** x automatic (semiautomatic is recommended)
wedge x ball x bump
- Press **HEIGHT SETUP** – move to 1st bond and press the “bond button” on the “Control-Puck”, move to 2nd bond and do the same; values can be find at the **ADV. SETTINGS**. Here the “Work height” means the distance that the bond tool rises after the 2nd bonding.
- Set the **LOOP HEIGHT** = height bond tool rises after the 1st bonding.
- Set **Y-WAY** = Y table travels to the programmed value after 1st bonding and reached height.
- Edit the tool movement sequence in **ADV. SETTINGS**, **LOOP PARAM.** for the defining the loop shape (optional).
- Set the work stage temperature.
- Bonding parameters settings for the **BOND 1** and the **BOND 2** :
 - US** – Adjust the relative strength of the ultrasound signal (0 – 2 000 mW)
 - Time** – Set the time period for the force and the ultrasonic energy application during the bond cycle (15 – 2 000 ms)
 - Force** – Set the amount of force to be applied to the bonding tool during the bonding cycle (1 – 1 500 mN)
- **Bonding** – Move to the 1st bond location, press the “bond button” on the “Control-Puck”, set precisely the positon, release the button.
 - Move to the 2nd bond and do the same.

End of use:

- Put the work stage out of reach of the bonding tool. **Set program No. 1.**
- Switch off the wire bonder instrument.

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Safety instructions and Troubleshooting

- Never use the wire bonder machine if you are not allowed to.
- Do not change the bonding tool by yourself if you are not allowed to – it required precise settings. Contact the guarantee of the instrument Zuzana Lišková.
- Do not touch the special coper screw which holds the wedge tool in the transducer. You can damage it or strongly affect bonding parameters in a negative way.
- Do not change the wire spool by yourself if you are not allowed to. Contact the guarantee of the instrument Zuzana Lišková.
- Before the working distance setting by adjusting the stage bottom always loose the locking screw.
- Both the special tweezers (marked TPT) should be handled carefully.
- Maximum temperature of the heated work holder is 250 °C. Be careful. Let the heated work holder cool down before replacing.
- Do not touch the electrode or the wire during bonding or when manually firing the EFO (Electronic Flam Off – used for Ball bonding). The System produces a high voltage spark. If you are a person with abnormal heart conditions or artificial heart stimulation devices (e.g. pacemakers) you should not operate this instrument.

Troubleshooting

- ERROR during bonding – ERROR on the screen, bleeping, bonding tool stays in the lowest position => press “Reset button! on “Control-Puck”, unscrew the stage bottom to set better working distance (decrease the distance between the tool and the sample).
- The wire is not sticking to the surface during bonding => set a higher value of the “Time” and the “Force”. If this does not help set a higher value of the “US” until the adhesion is sufficient.
- The wire is not sticking to the surface and the metal layer is damaged during bonding => set a lower value of the “US”. If this does not help use a new metal layer with better surface adhesion as an electrode (use a Ti layer below an Au layer, clean the surface before metallization to remove e.g. all the remaining unwanted resist by means of the plasma cleaning).