



Shuttle star®

BGA Rework Station SV-650A Introduction



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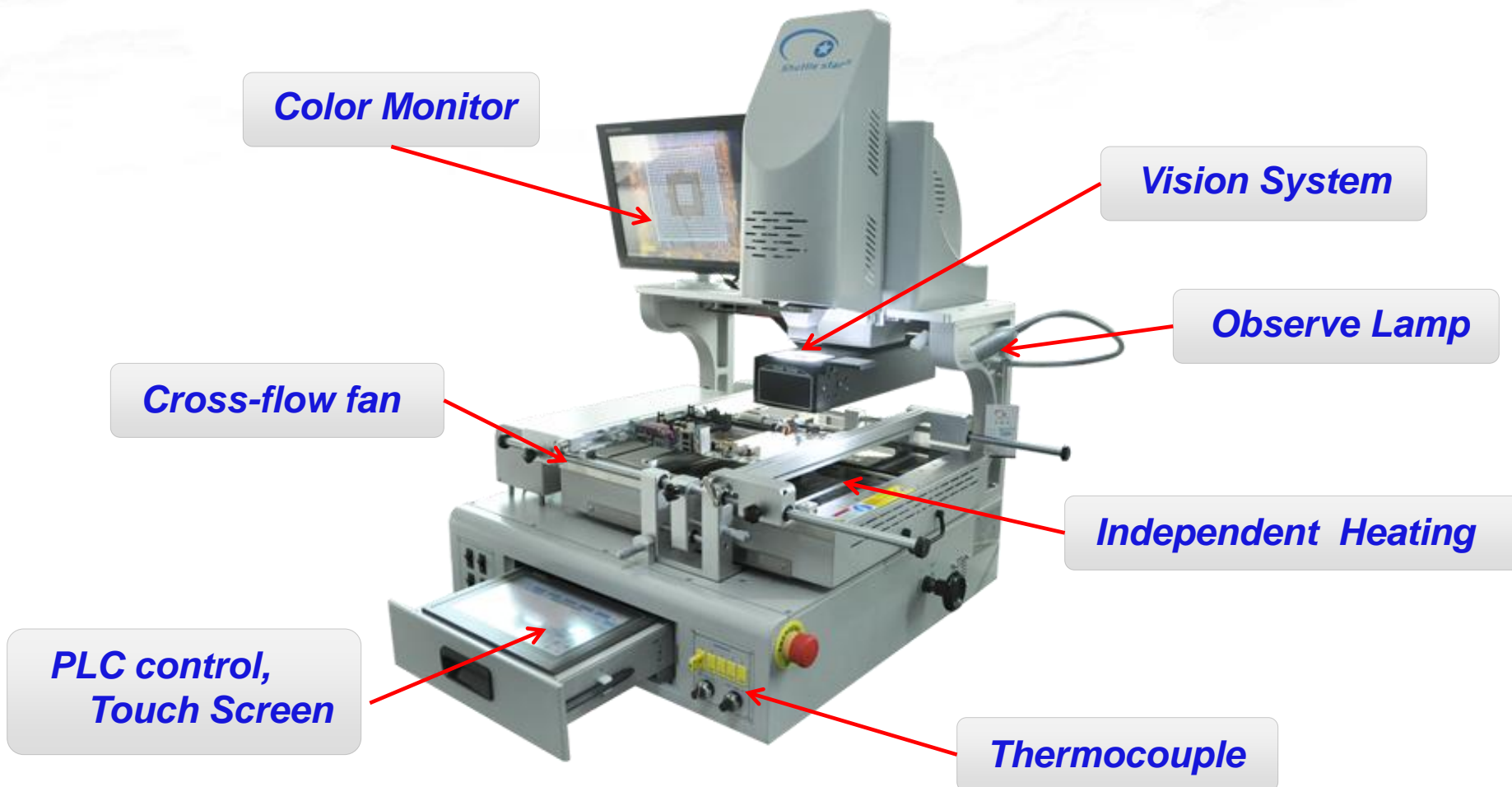
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1.SV-650A Profile—Parts Introduction

BGA rework station SV-650A Introduction



1.SV-650A Profile—Features

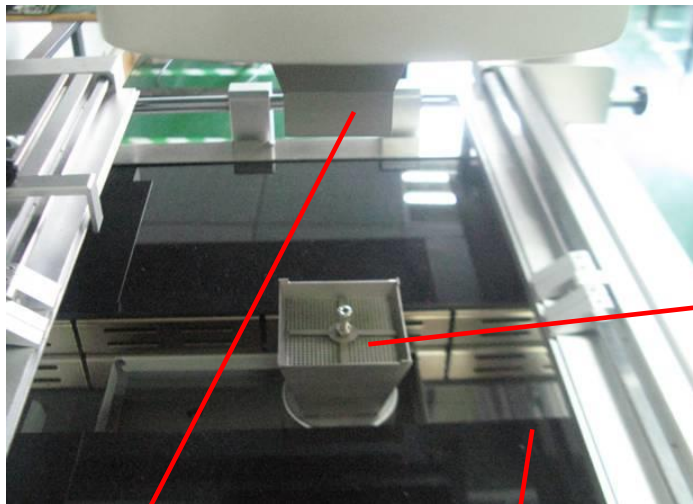
BGA rework station SV-650A Introduction

- Hot air heater head and mounting head are designed 2 in 1, driven by step electric motor, have both the auto soldering and mounting function;
- Three heaters(upper/lower hot air heater, bottom IR heater) heating independently, time and temperature can be displayed digitally on touch screen;
- Upper heater used the auto cooling and heating device, temp be controlled precision and uniform;
- Bottom preheating used the imported IR heating tube, with high temperature glass, which makes heating and cooling quickly, set process curve precisely and the whole piece of PCB deformation, easy to solder, energy conservation and environmental protection;
- Large movable bottom IR heating area, PCB clamps can be adjusted along with X & Y table flexibly, the max PCB size it can handle up to 540*450mm;
- Color optical system with functions of split vision, zoom in/out and micro-adjust, equipped with aberration detection device; with auto focus and software operation function, 1.3 million pixels high definition camera, 18 x optical zoom;
- Embedded industrial computer, touch screen interface, PLC control, real-time profile display, able to display set profile and 5 practically tested profile at the same time; can analyze the five practically-tested profiles;
- High-definition color LCD monitor;
- Built-in vacuum pump, 60 ° rotation in ϕ angle, mounting nozzle is micro-adjustable;
- 8 segments of temperature up(down) and 8 segments constant temperature control, profile saving is unlimited in the industrial computer;
- Suction nozzle can identify material and mounting height automatically, and can control the air pressure within a small range of 30-50g;
- Can automatic absorption and putting the material, automatic solder, placement and welding;
- Equipped with different hot air nozzles, easy to replace and able to locate in any angle.

2.SV-650A Hardware Compose—Heating System

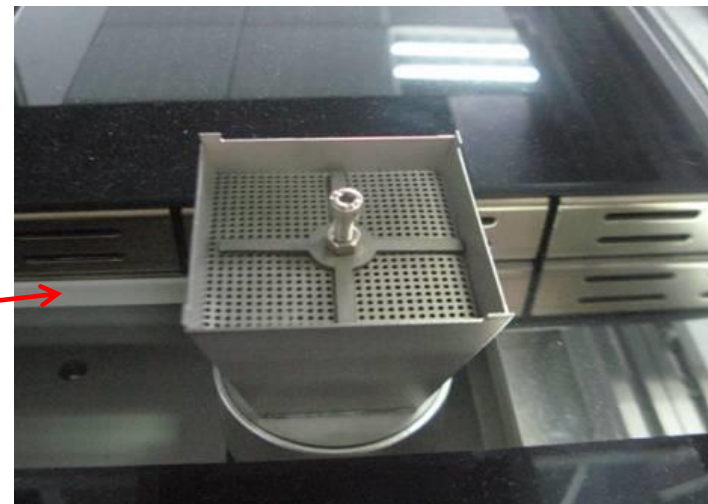
BGA rework station SV-650A Introduction

Heating system: Three independent temperature zones, (top hot air heating, under hot air heating, and bottom IR heating), temperature and time can be displayed digitally on the touch screen, able to rework BGA



Top heater

Bottom IR heater

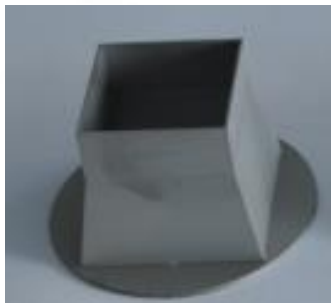


Lower hot air heater

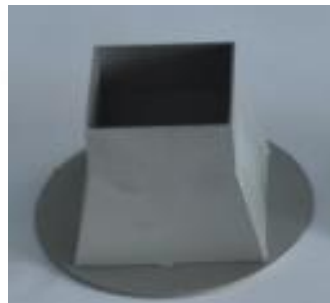
2.SV-650A Hardware Compose—Heating System

BGA rework station SV-650A Introduction

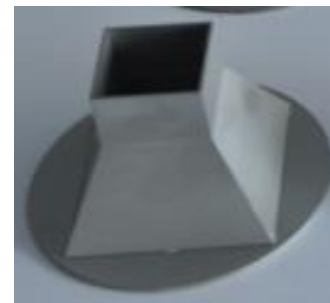
Nozzle: Different-sized nozzles for different-sized BGAs, for particular component, nozzle can be custom-made.



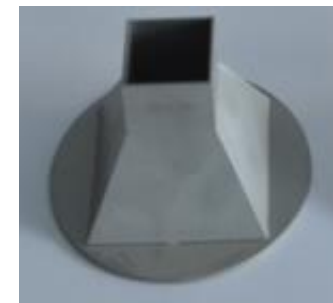
44x44mm



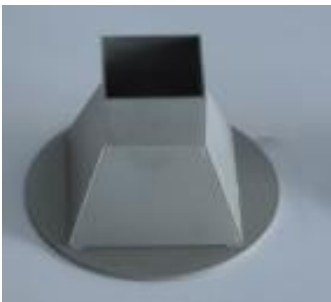
38x38mm



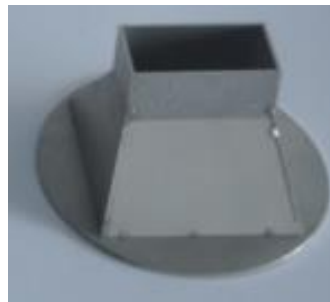
31x31mm



24x24mm



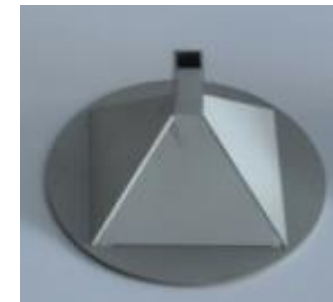
28x28mm



44x28mm



18x8mm



7x7mm

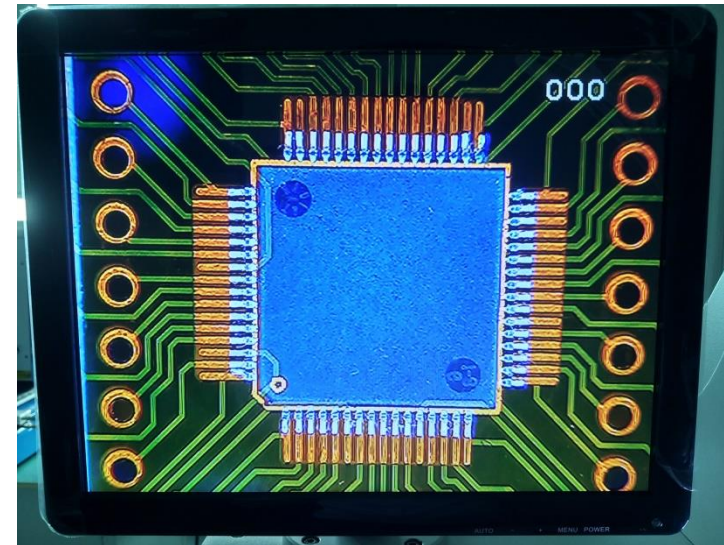
2.SV-650A Hardware—Alignment & Placement System

BGA rework station SV-650A Introduction

Alignment & placement: Mega pixels, high-definition color optical vision system, with functions of spectral, amplification and fine-tuning, including color difference distinguish device, automatic focus, software operation function, applying the prism optical principle to make both up and down image clear and accurate.



Can be automatically
counterpoint, easy and
flexibly to operate

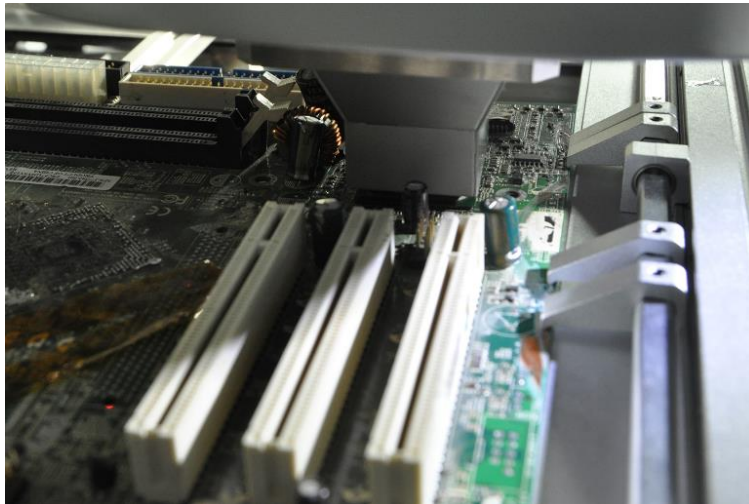


Blue image for IC, yellow
image for PCB

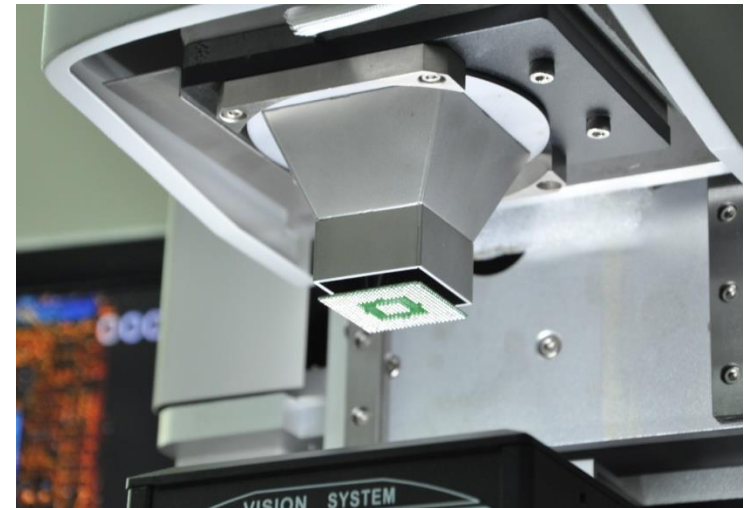
2.SV-650A Hardware—Alignment & Placement System

BGA rework station SV-650A Introduction

Hot air head and mounting head are designed 2 in 1, and have both the auto soldering and mounting function, easy to operate.



SV-650A BGA placement



SV-650A BGA Removal

2.SV-650A Hardware—Alignment & Placement System

BGA rework station SV-650A Introduction

Pressure from the suction to the IC can be micro-adjusted, minimum pressure less than 30g, ensure BGA not leak lead while heating.



Pressure testing

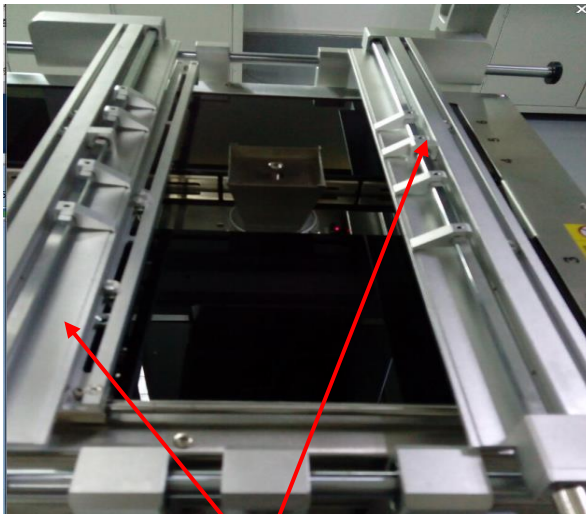


Suction nozzles in package

2.SV-650A Hardware—clamping Device

BGA rework station SV-650A Introduction

Clamping device: Specially designed with flexibly-moving clamping device to clamp all kinds of PCB, also equipped with particular clamps for laptop motherboard



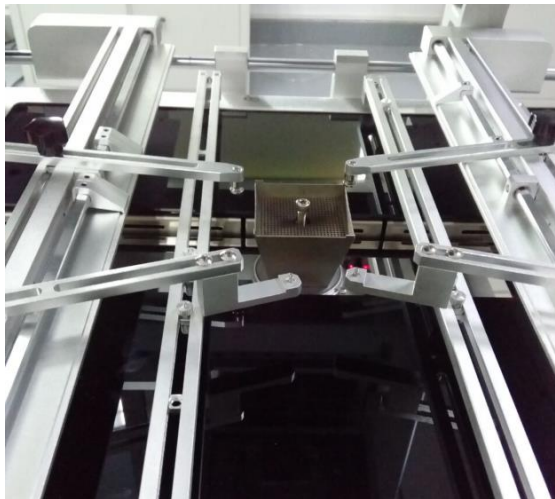
**flexibly-moving
clamping device**



**Particular clamps for
laptop motherboard**

2.SV-650A Hardware—Clamping Device

Clamping device: Clamps installing schematic diagram; the irregular PCB like laptop motherboard can be grasped flatly by the clamps.



Installing diagram

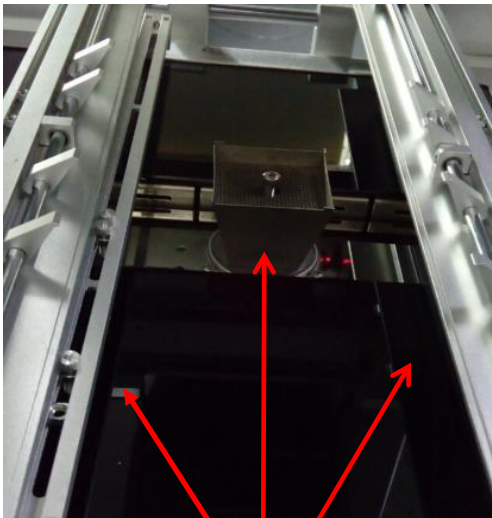


Clamping diagram

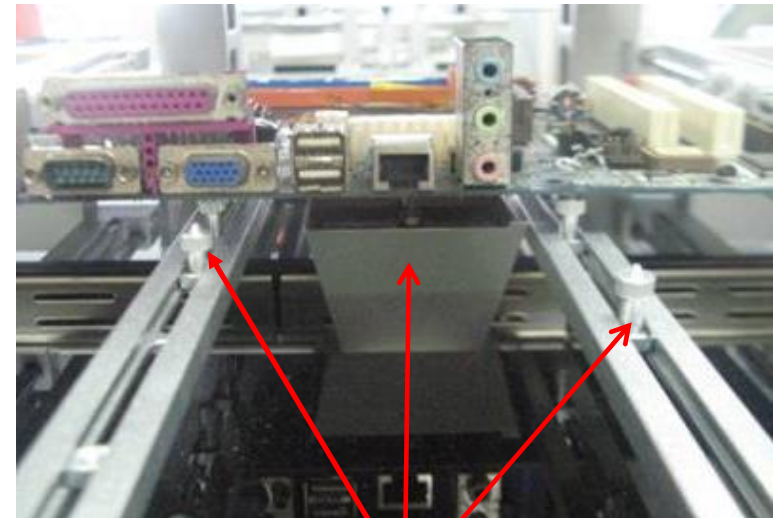
2.SV-650A Hardware—Clamping Device

BGA rework station SV-650A Introduction

Clamping device: Special anti-warpage design ,the support pillars can be adjusted up & down to support the board to prevent the PCBA from sinking while heating.



Anti- Warpage support

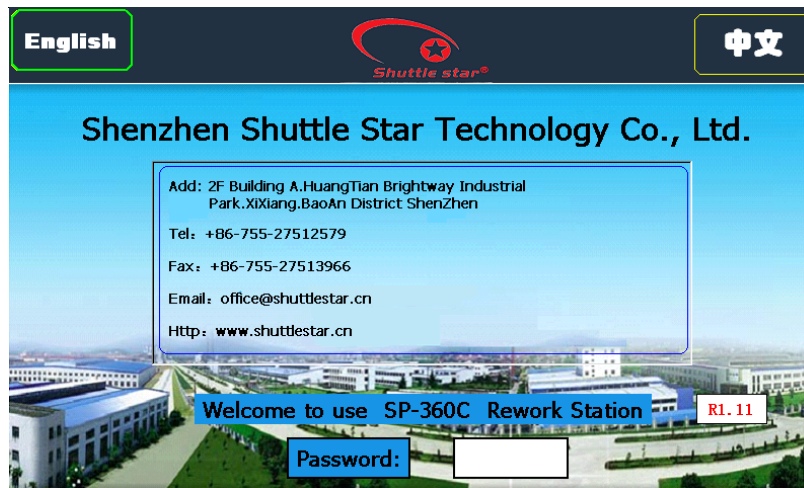


**Anti- warpage support
working diagram**

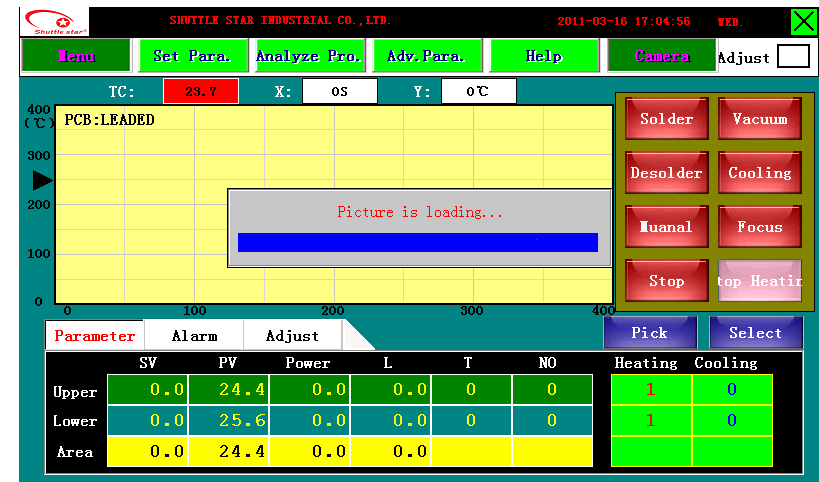
3.SV-650A Software Introduction—Adjustment Interface

BGA rework station SV-650A Introduction

Control interface: RW-SV650A with touch screen interface, PLC control; able to display real-time temperature curves and detecting temperature curves at the same time



Startup screen



Main operation screen

3.SV-650A Software Introduction—Adjustment Interface

Adjustment interface : Able to arrive at three independent temperature zones, temperature and time can be displayed digitally on the touch screen, 8 segments of temperature up (down) and 8 segments constant temperature control, more than 50000 groups of profile can be stored.



SHUTTLE STAR INDUSTRIAL CO., LTD. 2011-03-16 17:05:13 WED.

Menu Set Para. Analyze Pro. Adv. Para. Help Camera Adjust ☐

PCB **LEADED** Nozzle **38**

| Upper | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------|-------|-------|-------|-------|-------|-----|-----|-----|
| Rate | 200.0 | 200.0 | 200.0 | 200.0 | 200.0 | 0.0 | 0.0 | 0.0 |
| Target | 55.0 | 185.0 | 160.0 | 230.0 | 180.0 | 0.0 | 0.0 | 0.0 |
| Dwell | 45 | 75 | 40 | 60 | 5 | 0 | 0 | 0 |

| Lower | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------|-------|-------|-------|-------|-------|-----|-----|-----|
| Rate | 200.0 | 200.0 | 200.0 | 200.0 | 200.0 | 0.0 | 0.0 | 0.0 |
| Target | 55.0 | 185.0 | 160.0 | 240.0 | 260.0 | 0.0 | 0.0 | 0.0 |
| Dwell | 45 | 75 | 40 | 15 | 50 | 0 | 0 | 0 |

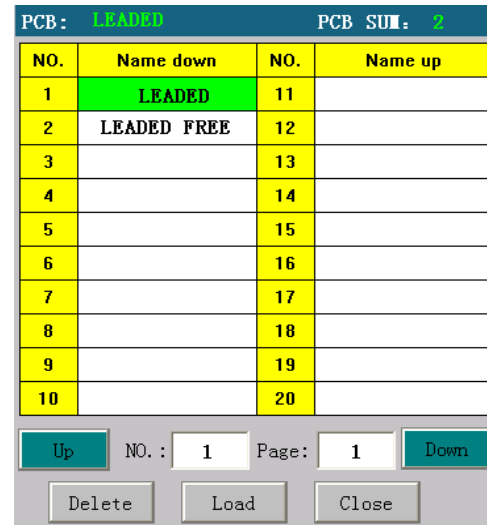
Pre. Temp Offset
0 0

Pre. Power Cooling
0 0

Area Alarm
0 5

Pb ☒ Select Pb ☐

Parameter Setting



PCB: **LEADED** PCB SUM: **2**

| NO. | Name down | NO. | Name up |
|-----|-------------|-----|---------|
| 1 | LEADED | 11 | |
| 2 | LEADED FREE | 12 | |
| 3 | | 13 | |
| 4 | | 14 | |
| 5 | | 15 | |
| 6 | | 16 | |
| 7 | | 17 | |
| 8 | | 18 | |
| 9 | | 19 | |
| 10 | | 20 | |

Up NO.: 1 Page: 1 Down

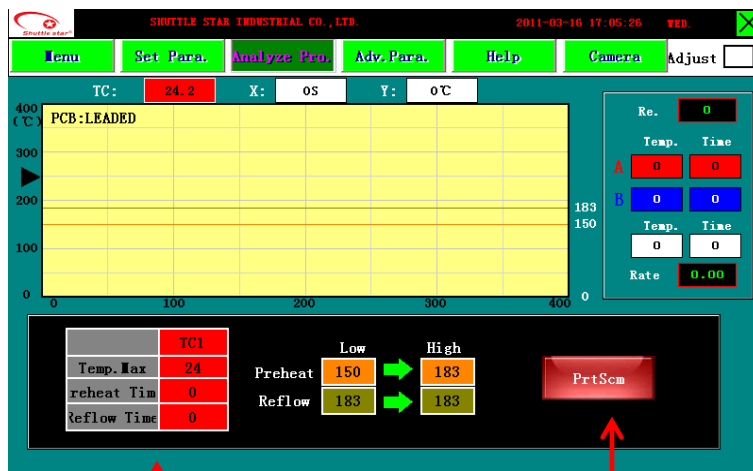
Delete Load Close

Profile Name Setting

3.SV-650A Software Introduction—Analysis Interface

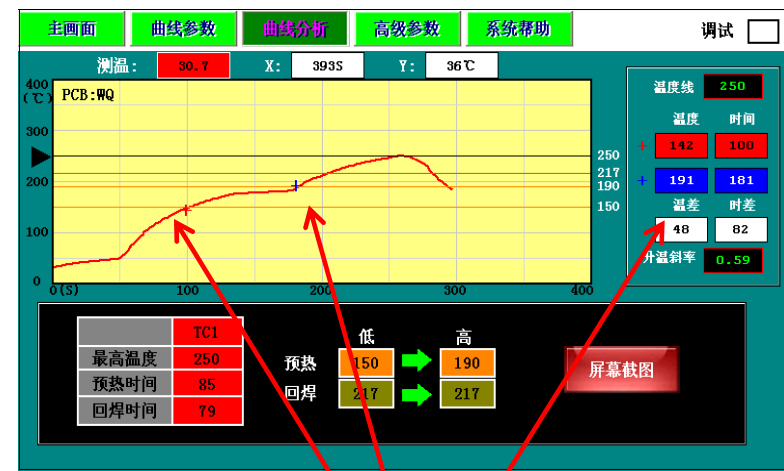
BGA rework station SV-650A Introduction

Analysis interface: able to display 1 practically-tested temperature curve at the same time, and auto-calculate the preheat time, reflow time and max temp, so to control temp. of every point of BGA overall; can create profile for every kind of BGA accordingly.



profile analysis column

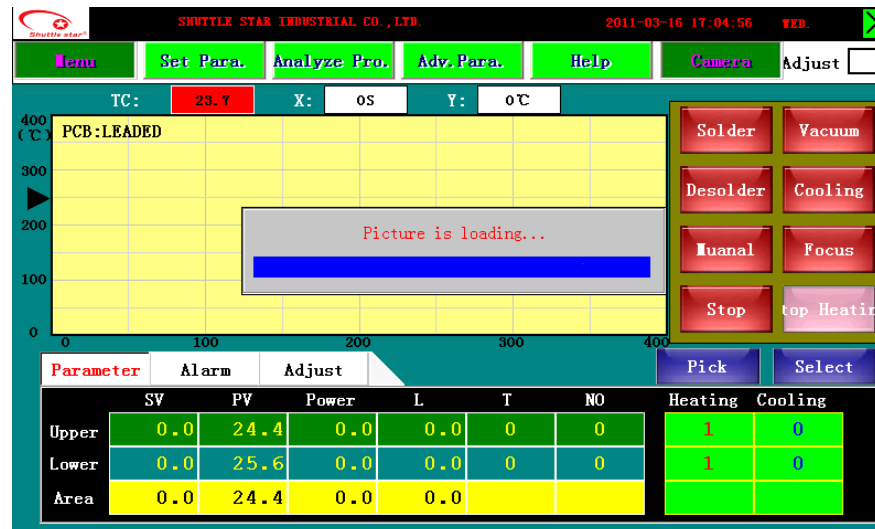
Screenshot



Analysis for points

3.SV-650A Software Introduction—Instant Regulation

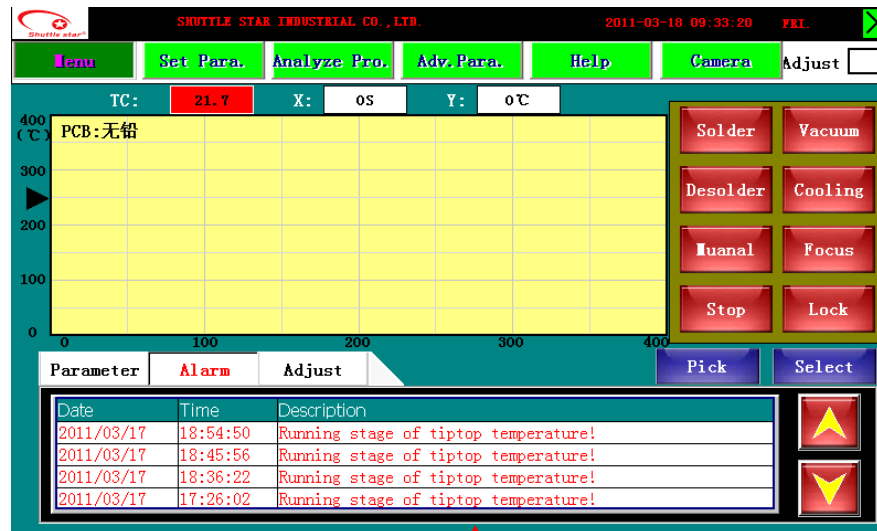
Instant regulation: During heating, if find the TC temperature too low or too high, parameters can be changed while it is heating under the Instant Regulation function to avoid repeat heating.



Click “L” or “T” in the down column to change parameters while heating

3.SV-650A Software Introduction—Alarm Interface

Alarm Interface: Under this menu, it points out troubles and error while machine is working. By this caution, we may know what problem the machine faces and make quick trouble shooting.

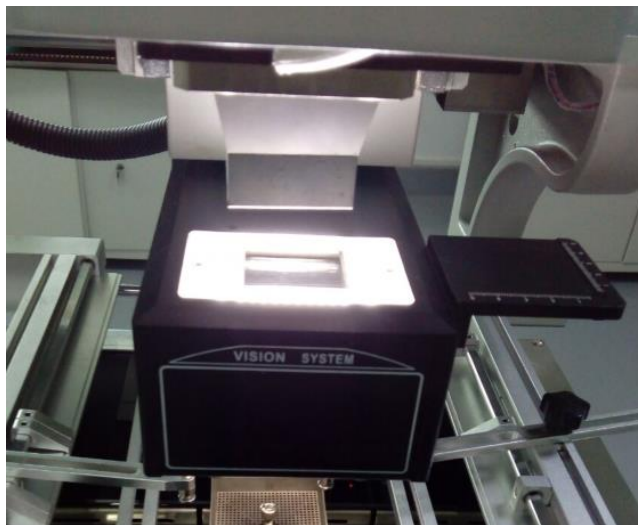


Abnormal alarm event description

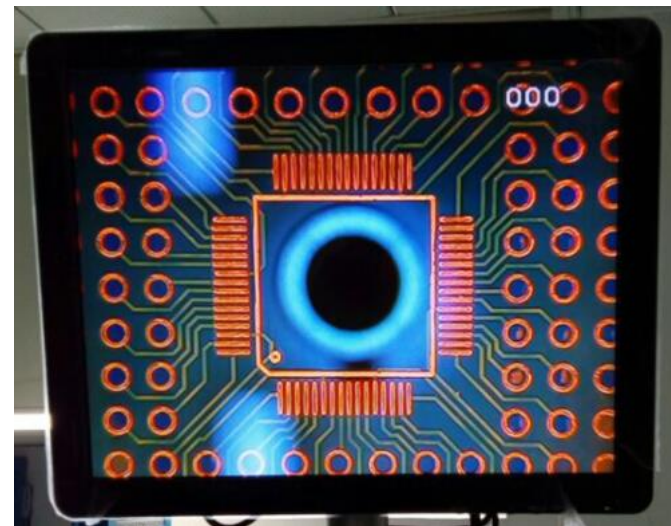
4.SV-650A Accuracy Testing —Placement Accuracy

BGA rework station SV-650A Introduction

Optical Alignment System: Mega pixels, high-definition color optical vision system, with functions of spectral, amplification and fine-tuning, including color difference distinguish device, automatic focus, software operation function, able to rework BGA sized up to 80mm*80mm



Alignment through camera



Color image in display

4.SV-650A Accuracy Testing —Placement Accuracy

BGA rework station SV-650A Introduction

Alignment accuracy: automatic servo system controls BGA placement, desolder and solder; placement accuracy reaches 0.01mm, which is suitable for the smallest IC with pitch of 0.15mm



Desolder & Solder



Placement

4.SV-650A Accuracy Testing —Placement Accuracy

Color optical system with functions of split vision, zoom in/out and micro-adjust, equipped with aberration detection device; with auto focus and software Operation function, 22 X optical focus



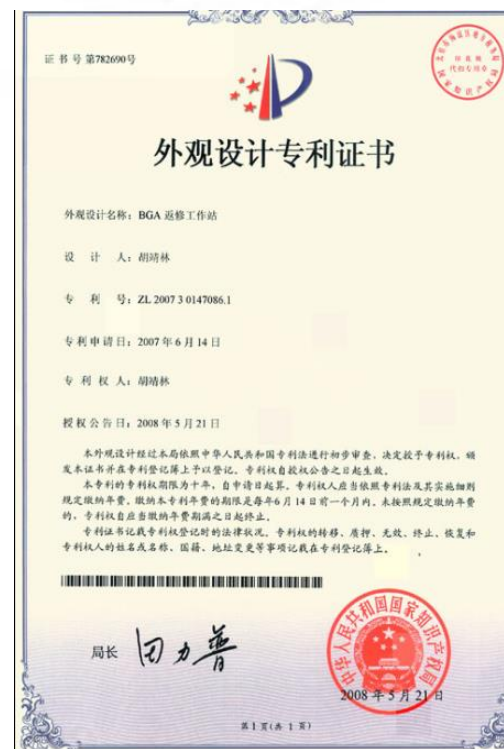
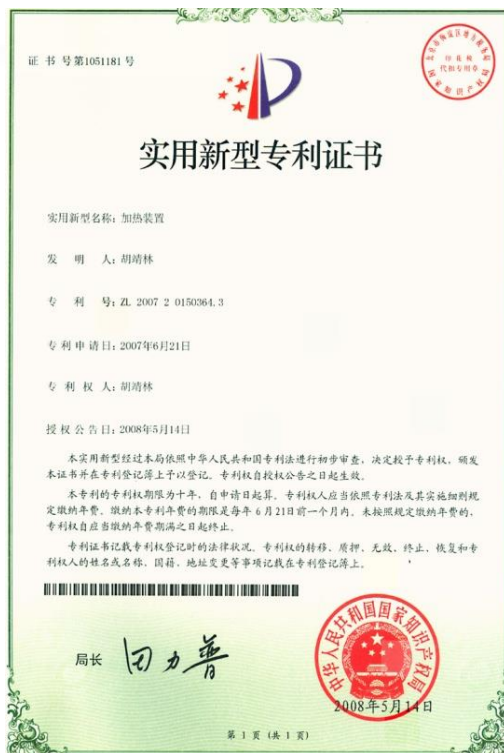
5.SV-650A Specification

BGA rework station SV-650A Introduction

| PCB & Component Requirements | |
|---------------------------------|---|
| Max.PCB size | 540mm x450mm |
| Max.PCB thickness | 0.5~4mm |
| Max.BGA size | 80mm x 80mm |
| Min.BGA size | 4mm x 4mm |
| Max. BGA weight | 80g |
| Vision System Specifications | |
| Max. visible area | 40mm x 40mm |
| Min. Pitch | /0.15mm |
| Micrometer Adjust Range | Front/Rear ± 5 mm Left/Right ± 5 mm |
| Rotation Angle | 360° |
| Thermal Specifications | |
| Max.temp.for hot-air heater | 350° C |
| Max.temp.for IR heater | 400° C |
| Temperature control | 8-Stage Programmable Temperature Settings |
| Upper heater power | 1200W |
| lower heater power | 800W |
| Bottom IR heater power | 3600W |
| Dimensions & Power Requirements | |
| Machine dimension | 746mm (L) 710mm (W) 820mm (H) |
| Weight | Appox 90Kg |
| Power Requirements | Single Phase, 220VAC, 50/60 Hz, |

6.SV-650A Patent & Awards

BGA rework station SV-650A Introduction





Thanks for your time !

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