

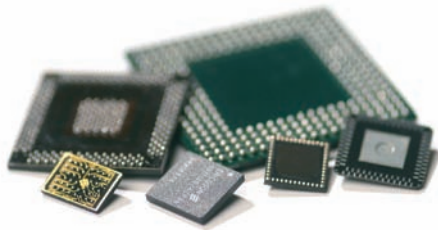
Weller®

# BGA / QFP Repair and Rework



**COOPER** Tools

# Components Identification Chart



## Components with no direct access to the solder joint

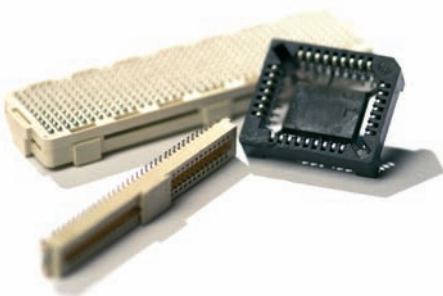
To this group, belong the Ball Grid Array family of devices such as (PBGA, CBGA, CCGA), CSP's or Micro BGA and components with more recently developed housings such as QFN, LLC and LLP devices.

All of these components demand precise placement and accurate control of the temperature profile to ensure the reliability of the repair.



## Leaded components with external solder joints

To this group belong the L-leaded (QFP), the J-leaded (PLCC) and SOP components. These devices can have many leads on a very fine pitch and require delicate handling in the placement process to avoid damage to the leads.



## Special modules

These include the various types of reflow solderable SMT sockets and also through hole mounted devices such as Pin Grid Arrays (PGA).

**Weller remains at the forefront of Rework Technology.**

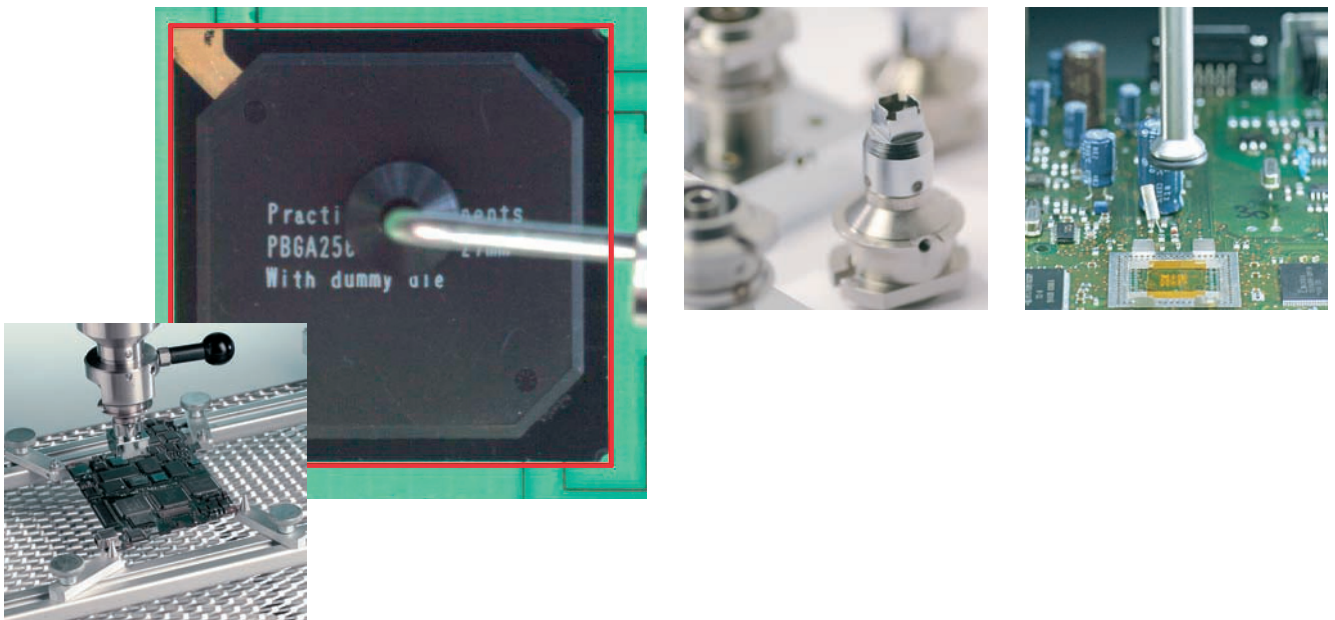
**As on board components have become more and more complex Weller has led the field with innovative, user friendly repair and assembly tools that solve the rework problem.**

The introduction of the BGA was no exception, with its small footprint area, hidden connections, and high connection density, rework operators have been presented with very real placement and thermal problems.

The WQB 3000 machines are the second generation of the Weller BGA/SMT repair system. They meet the exceptional demands required of a modern rework tool and deliver the benefits at a value for money price.

Weller has developed a comprehensive user friendly programme for the removal and reballing of BGA components, site preparation, solder paste printing / flux application, placement and reflow, without the risk of thermal damage to the component or the circuit board.

No matter what the component, BGA, QFN, QFP, PLCC, SOP, PGA or surface mounted sockets, Weller has the rework answer.



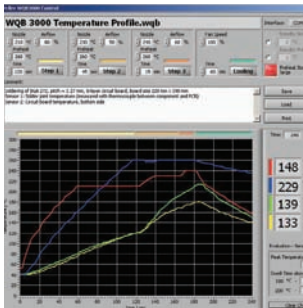


# The Problems

Due to the rapid advances in SMD component development, increasingly complex processes are demanded for assembly and rework. Ball Grid Array and fine pitch leaded component rework need considerable technical expertise to achieve a successful repair.

The Weller WQB 3000 system has this capability.

## The Rework Cycle:



### Development of the temperature profile

- Repeatable results can only be achieved by a process cycle that considers all the parameters of the repair operation.
- To allow removal of the component from a circuit board without damage to the board, a temperature profile of the operation must be established. The "Self Teach" feature of the WQB 3000 provides a quick and easy method of finding the parameters of the process cycle, without the need of in depth operator knowledge.

### Component Removal

- Necessary for successful re-flow of the solder joints is the ability to preheat the circuit board and a temperature/time controlled process.
- A vacuum actuated lift to automatically remove the component from the board with minimum force at the end of the reflow cycle to ensure no damage to the solder pads.

### Cleaning of the circuit board

- Residual solder should be removed from the board with a desoldering iron or desolder wick.
- Residual contaminants should be removed with a suitable solvent spray.

### Solder Application.

- Stencil printing should be used to apply fresh solder to the pads, this ensures that the correct volume of solder paste is deposited.
- Additional to the WQB 3000 system, Weller offers the MSP 2000 solder paste printer. For further details contact your local Cooper Tools office.

### Positioning of the component

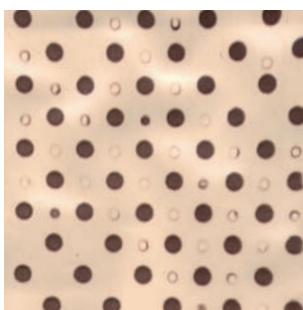
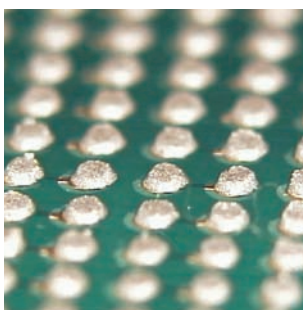
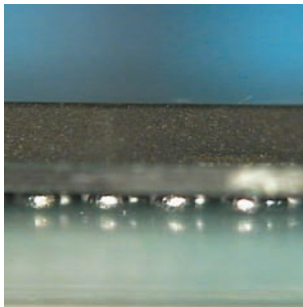
- A precise positioning system is required to place components with hidden joints, Weller offer two distinct systems.
- WQB 3000 uses the patented Weller template positioning process, a low cost but precise operation.
- A wide range of templates, for BGA, QFP and PLCC components are listed on page 11 of this brochure.
- WQB 3000 OPS uses a computer aided camera placement system, which is particularly useful if it is necessary to place a wide range of components.

### Soldering of the component

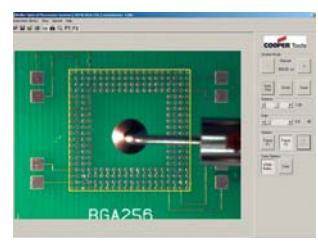
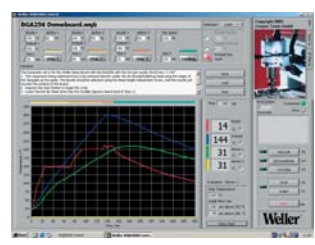
- Reflow of the replaced component is a repeat of the removal process except the vacuum lift is not initiated at the end of the profile.
- To cater for the many body sizes of BGA devices, a wide range of hot gas nozzles are listed on page 12 of this brochure.
- To solder QFP and PLCC packages, an adapter is available to permit the use of the Weller NQ/ND family of hot gas nozzles.

### Inspection of the solder joint

- Once the rework process has been verified by inspection of the completed repair, then the repeatable profile controlled by the stored programme can be applied ensuring that all subsequent repairs are carried out to the same parameters reducing the necessity of inspection to a minimum.



# The Solutions



**WQB 3000 OPS**  
BGA/SMT rework system  
for component placement  
with camera aided position-  
ing system



**WQB 3000**  
BGA/SMT rework system  
for component placement  
with templates

# Weller WQB Repair System

The new WQB Repair System upgrades the Weller product range in the SMD repair tool sector. A well thought-out design concept combines reliability and maximum process control with ease of use and technically mature detail solutions. Useful accessories increase the possible uses of this repair work station.

For the universal circuit board repair of SM components, it is necessary to effectively pre-heat the circuit board from below, and from above to precisely heat the components to be repaired to the reflow temperature, as well as to reliably control the process. On the WQB 3000 the temperature-regulated 2-zone infrared bottom heater provides rapid warm up and homogeneous substrate temperatures. The hot gas top heater, with digital control electronics for temperature monitoring and regulation of the air flow rate, facilitates the finely metered supply of heat to the components. A temperature sensor placed directly in the hot gas nozzle efficiently regulates the top heater and thus provides maximum process control.

For the repositioning of components after desoldering, two system versions are available:

1. The **WQB 3000 OPS** with the camera aided positioning system. Regulation and control via PC
2. The **WQB 3000**. The positioning ensured by the proven and patented template system from Weller. Control is via the programming unit, which can store up to 30, programmed profiles. Alternatively, the WQB 3000 can be controlled with the Weller software package "WQB 3000 CONTROL" via a PC.

1

## Base unit

- Robust, torsion-free welded design
- Antistatic, powder paint coating
- Height adjustable table feet
- 2 horizontal independent sliding arms with placement head and soldering head fitted to precision linear feed
- Pneumatically driven locking mechanism for the two arms
- 2 additional thermocouples type K can be connected for determining temperature profiles
- Tunnel-shaped duct in the housing for very long circuit boards
- Process state indication by means of light emitting diodes
- RS-232 interface for programming unit or PC control

2

## Preheater

- High temperature infrared radiation elements 2 zones switchable:
- Small preheating zone: 400 Watt approx. 125 x 125 mm<sup>2</sup>
- Large preheating zone: 1600 Watt approx. 270 x 270 mm<sup>2</sup>
- Temperature regulation by means of thermocouple sensor
- Protection against accidental contact by means of cover plate
- Bottom heater can be moved in the longitudinal direction along the base table

3

## Soldering Head

- Precision linear feed for Z adjustment
- Continuously adjustable depth stop
- Fan with speed control for cooling at the end of the process
- Theta rotation of the heater head in the range from -5° to 95°
- Bayonet fixing for hot gas nozzle with locking ring
- Vacuum pick up with lift to automatically raise the desoldered component from the board. The pick up tube height above the component is adjustable upto 10mm.
- Connection for the hot gas nozzle temperature sensor in the soldering head
- Heater element max. 700 W rating
- Damped lowering of the soldering head
- Swivelling halogen light

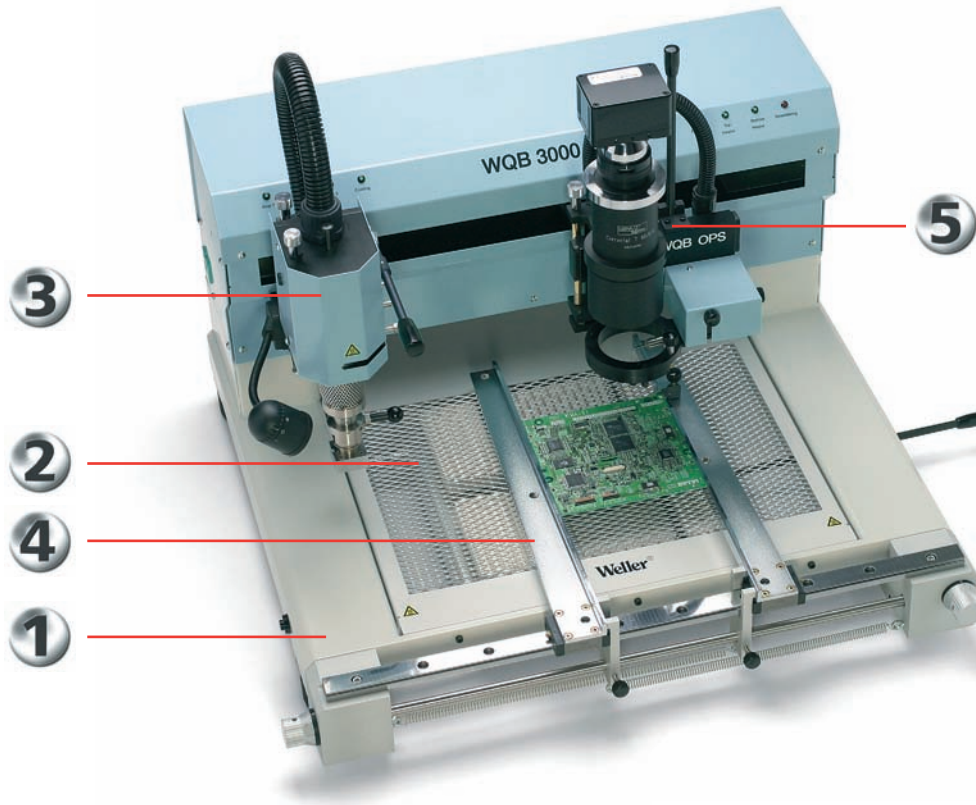
4

## Circuit Board Holder

- Precision linear feed unit with 2 slides for the clamping arms
- Precision drive in x and y direction
- Adjustment range +/- 10 mm
- Accuracy +/- 0.05 mm
- Board size
- wide max.: 495 mm
- wide min.: 30 mm
- length: unlimited

## WQB 3000 OPS

### Component placement with camera aided positioning system



5

#### Camera aided positioning system

- Precision linear feed for Z adjustment
- Adjustable depth stop
- Automatically vacuum activation
- Telecentric precision objective lens
- Progressive Scan CCD Color camera with full digital data transfer
- 3 different vacuum pick ups
- x-, y- and Theta precision drive



#### Scope of supply of the WQB 3000 OPS

- Base unit with top heater, bottom heater, control electronics and pneumatic unit
- Positioning unit with digital camera and telecentric objective
- Circuit board holder with fine adjustment in x- and y- direction
- Illumination for soldering head
- Temperature sensor PT 100
- Push rod for bottom heater
- Nozzle change tool
- 5 pieces suction insert Ø 4.5 mm
- 5 pieces suction insert Ø 10 mm
- Mains cable
- Software "WQB 3000 CONTROL" and "WQB OPS"
- Serial interface cable
- Calibration tool
- 3 changeable vacuum pick ups
- 2 m connecting tube for compressed air
- Instruction manual

#### System requirements

- Requirement for use of the positioning system is a standard PC with the following recommended equipment:
- Intel Pentium with minimum 1 GHz, CD-ROM, minimum 128 MB RAM
  - Operating system: Windows NT 4.0, Windows 2000, Windows XP
  - RS 232 & IEEE 1394 (FireWire™)
  - Graphics card with direct-draw support, recommended resolution 1280 x 1024, minimum 16-bit colour resolution

With the new WQB 3000 OPS, Weller underscores its high capability for innovation in the repair sector and presents a new type of camera-supported positioning system for the WQB 3000 re-work system, allowing all popular components up to edge length of 45 x 34 mm to be securely and precisely mounted.\*

At the heart of the placing systems is the modern Progressive Scan CCD colour camera with fully digital data transfer. The high image resolution, the superb image quality at high dynamics and the very low image noise create the basis for universal, precise and ergonomic component mounting. A IEEE 1394 FireWire™ interface controller ensures rapid data transmission from camera to PC. The telecentric precision objective lens produces an image of the component to be placed free of perspective distortion and has a wide depth of focus.

The delivered positioning software contains a component library, from which the component to be placed is selected. New components can be edited very easily by the user and added to the library.

Using the built-in positioning frame in the live image from the camera, the circuit board and the component can be aligned independently of each other using the x, y and theta axis fine adjustment drives. The component is deposited on the circuit board under spring damping, which is simplified by automatically switching the vacuum off, thus preventing any unintended movement of the component.

#### Technical Data WQB 3000 OPS

Dimensions (L x B x H):	Approx. 650 x 600 x 500 mm
Mains Voltage:	230 V, 50 / 60 Hz
Rating:	
Top / Bottom Heater:	700 W / 1600 W
Temperature Control:	Continuous 50°C – 400°C; Control Accuracy ± 10°C
Flow Rate Control:	Continuous 5 – 50 l/min.
Air consumption:	60-100 l/min at 4 bar
Compressed air supply:	400 – 600 kPa purified, dry compressed air
Total Weight:	Approx. 43 kg

#### Accessories (Optional)

- Large range of different hot gas nozzles
- Clamping set for circuit boards 005 87 549 24
- Support for large-sized circuit boards 005 87 557 45
- Manual control console for easy process control 005 87 549 42
- Thermocouple Type K, Ø 0.5 mm 005 31 190 99
- Thermocouple Type K, Ø 0.25 mm 005 87 549 51
- NO nozzle adapter for WQB 3000 005 87 549 70
- 10 pc. vacuum inserts Ø 4.5 mm 005 87 137 99
- 10 pc. vacuum inserts Ø 10 mm 005 87 137 98
- Temperature sensor for top heater 005 87 549 48
- Circuit board block 005 87 548 73
- Suppressing device for Circuit boards 005 87 557 41

\* Larger image sizes on request



# Rework cycle

## WQB 3000 OPS

### 1. Removal of the defective component

The soldering head fitted with the correct hot gas nozzle is lowered over the component. The required profile that will have been established from the self teach mode will be initiated and the desoldering process will start.

At the end of the process the component will be automatically lifted from the board by the vacuum pick up.

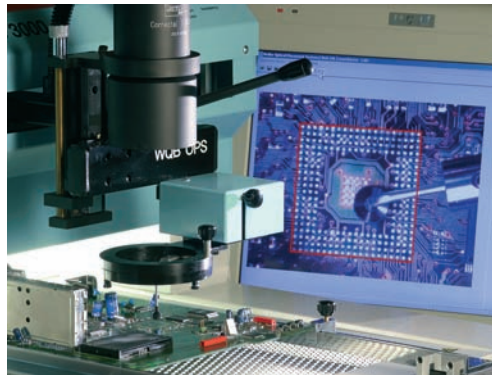


### 2. Positioning step 1

After removing the residual solder and cleaning the board. The board is then replaced into the board holder and the positioning unit is locked into place.

The program of the component is then chosen from component library stored on the computer and the positioning frame 1 is overlaid onto the image of the pad layout displayed on the computer monitor.

Using the x and y fine adjustment of the circuit board holder the frame and the pad layout are superimposed.



### 3. Positioning step 2

The new component is then picked up with the vacuum nozzle of the positioning unit and by means of the x, y and theta adjustments the component is placed inside the outline of the component being generated by the computer. The component is now placed down onto the circuit board.



### 4. Soldering of the new component

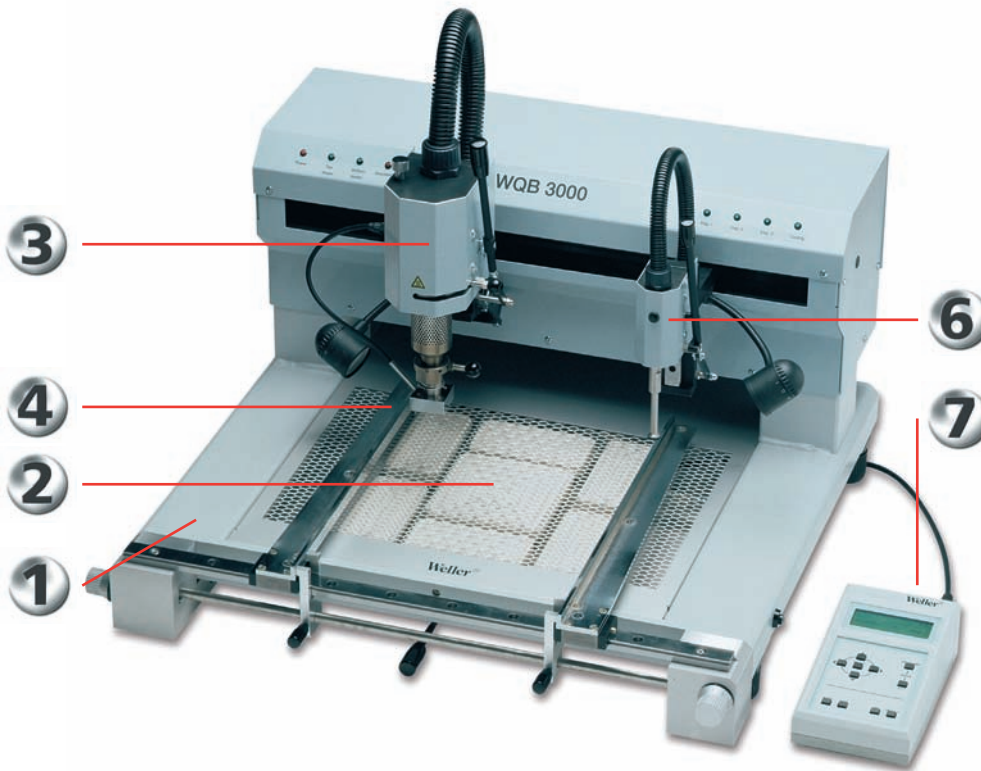
The positioning unit is now moved away and the soldering head moved into position and locked into place. The hot air nozzle is lowered over the component and profile that was used to desolder the component is initiated.

After completion of the process the hot air nozzle is raised and cold air blown over the component to cool the circuit board.





## WQB 3000 Component placement with templates



The WQB 3000 differs from the WQ3000 OPS in so much that it uses a template positioning system in place of computer /camera system.

The Weller template system offers a low cost but still precise positioning system for BGA and leaded components.

The templates can be used on populated boards and are manufactured for most BGA, QFP and PLCC components.

On the digital programming unit all process steps can be programmed, saved, and, if necessary, protected against unauthorized use as required. The most important process parameters are optionally displayed on the LC display during operation. The programming unit assists with the determination of temperature profiles and in this way facilitates the definition of optimal soldering process data in the easiest possible manner. Optionally the WQB 3000 can be controlled with a PC using the software "WQB 3000 CONTROL". The programming of comprehensive special functions permits the adaptation of the process to a very wide range of boundary conditions, and thus enables repairs to be made even on the most difficult assemblies.

### 6

#### Positioning head

- Precision linear guide for Z adjustment
- Lowering of placement head with shock absorption
- Reducer insert of vacuum pickup for small components
- Swivelling halogen light

### 7

#### Programming unit

- LCD display
- Key switch
- Connection to the base unit via RS-232 interface
- 30 programmable program sets
- Three process steps and subsequent cooling phase. The following parameters can be programmed separately for each process step:  
Temperature of bottom heater: 50°C - 400°C  
Temperature of top heater: 50°C - 400°C  
Air flow: 10 % - 100 % (5 l/min. 50 l/min.)  
Process time: 0 sec. - 999 sec.

#### additional:

- Cooling time: 0 sec. - 999 sec.
- Size of bottom heater: small - large
- Large range of special features like Standby temperature for top and bottom heater and Teach-In mode for determining temperature profiles.

#### Scope of delivery of the WQB 3000

- Base unit with bottom heater, soldering head, placement head, control electronics and pneumatic unit
- Circuit board holder with precision drive in x and y direction
- Lighting for soldering head and placement head
- Programming unit with RS-232 connecting cable
- Temperature sensor PT 100
- Push rod for bottom heater
- Nozzle change tool
- 5 pc. vacuum inserts Ø 4.5 mm
- 5 pc. vacuum inserts Ø 10 mm
- Reducer insert for the vacuum pickup
- Mains cable
- 2 m connecting tube for compressed air
- Instruction manual
- Software "WQB 3000 CONTROL" for the optional use of the system with PC

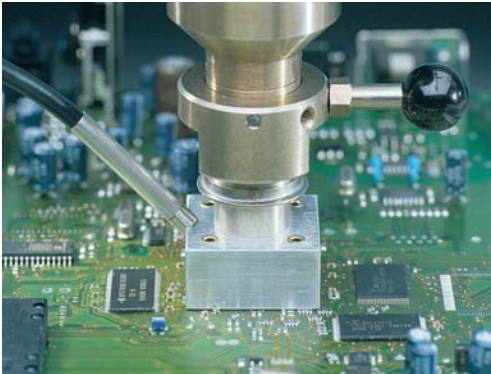
#### Technical Data WQB 3000

Dimensions (L x B x H):	Approx. 650 x 600 x 500 mm
Mains Voltage:	230 V, 50/60 Hz
Rating:	
Top / Bottom Heater:	700 W / 1600 W
Temperature Control:	Continuous 50°C - 400°C; Control Accuracy ± 10°C
Flow Rate Control:	Continuous 5 - 50 l/min.
Air consumption:	60-100 l/min at 4 bar
Compressed air supply:	400 - 600 kPa purified, dry compressed air
Total Weight:	42 kg

#### Accessories (Optional)

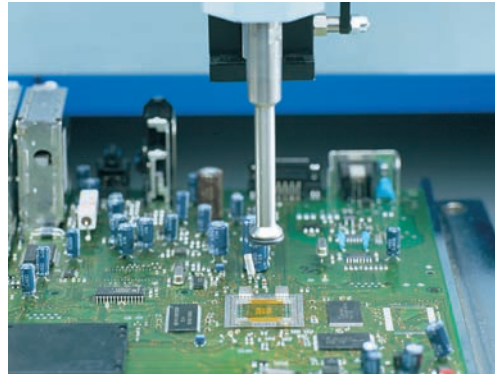
- Large range of different hot air nozzles and positioning templates
- Clamping set for circuit boards 005 87 549 24
- Support for large-sized circuit boards 005 87 557 45
- Manual control console for easy process control 005 87 549 42
- Thermocouple Type K, Ø 0.5 mm 005 31 190 99
- Thermocouple Type K, Ø 0.25 mm 005 87 549 51
- NQ nozzle adapter for WQB 3000 005 87 549 70
- 10 pc. vacuum inserts Ø 4.5 mm 005 87 137 99
- 10 pc. vacuum inserts Ø 10 mm 005 87 137 98
- Temperature sensor for top heater 005 87 549 48
- Circuit board block 005 87 548 73
- Camera aided positioning system WQB OPS 005 33 576 99
- Serial interface cable 005 31 191 99
- Suppressing device for Circuit boards 005 87 557 41

# Rework cycle WQB 3000



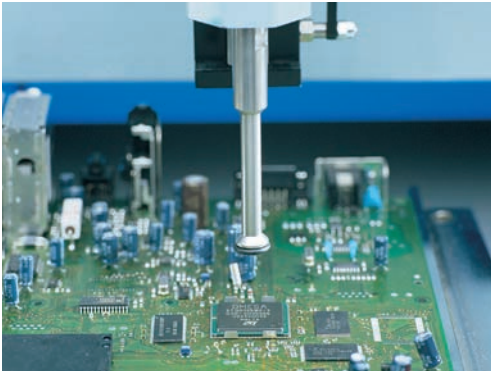
### 1 Desoldering of the defective component

The soldering head with suitable nozzle heats up the component in a temperature controlled reflow process. The "Vacuum Lift" allows the automatic take off of the component from the circuit board after the end of the process time.



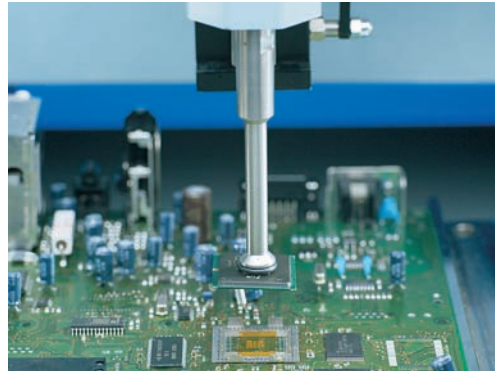
### 2 Alignment of the positioning template

After cleaning the circuit board (removal of the residual solder and flux) the positioning template will be aligned to the circuit board and fixed.



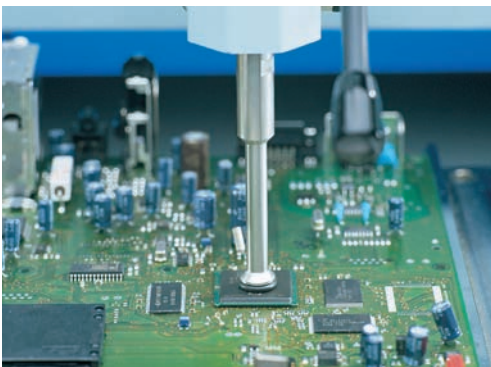
### 3 Insert new component onto the template

The connection balls of the BGA component centre the component exactly in the template



### 4 Placement head takes the component off from the circuit board

After the component is picked up with the vacuum pipette, the positioning template can be removed from the circuit board.



### 5 Placement head sets the component precisely positioned down to the circuit board



### 6 Soldering of the new component

The hot gas top heater and the infrared bottom heater enables a safe and purposeful heat up of the solder joints to the soldering temperature.

# Positioning templates for WQB 3000

## 1. BGA components

Matrix	Pitch mm	Positioning Template
23x23	0.5	005 87 549 45
29x29	0.5	005 87 479 32
35x35	0.5	005 87 549 46
<hr/>		
6x10	0.75	005 87 479 63
<hr/>		
10x10	0.8	005 87 479 58
12x12	0.8	005 87 549 81
13x13	0.8	005 87 479 59
14x14	0.8	005 87 479 34
15x15	0.8	005 87 479 73
16x16	0.8	005 87 557 05
17x17	0.8	005 87 479 71
18x18	0.8	005 87 479 64
19x19	0.8	005 87 548 41
20x20	0.8	005 87 557 06
21x21	0.8	005 87 557 07
22x22	0.8	005 87 557 08
<hr/>		
6x 8	1.0	005 87 479 33
9x13	1.0	005 87 548 46
11x19	1.0	005 87 548 47
12x12	1.0	005 87 479 29
14x14	1.0	005 87 479 30
16x16	1.0	005 87 479 31
18x18	1.0	005 87 547 78
22x22	1.0	005 87 547 60
24x24	1.0	005 87 547 79
26x26	1.0	005 87 547 77
29x29	1.0	005 87 547 61
30x30	1.0	005 87 548 49
32x32	1.0	005 87 548 74
34x34	1.0	005 87 548 50
39x39	1.0	005 87 479 87
<hr/>		
7x17	1.27	005 87 479 74
10x30	1.27	005 87 548 79
10x40	1.27	005 87 47 983
13x13	1.27	005 87 477 83
16x16	1.27	005 87 478 57
16x19	1.27	005 87 478 47
17x17	1.27	005 87 478 61
19x19	1.27	005 87 477 81
19x25	1.27	005 87 47 948
20x20	1.27	005 87 479 66
21x24	1.27	005 87 54 750
23x23	1.27	005 87 479 11
24x26	1.27	005 87 548 48
25x25	1.27	005 87 478 94
26x26	1.27	005 87 477 79
29x29	1.27	005 87 478 73
30x30	1.27	005 87 478 76
31x31	1.27	005 87 478 59
32x32	1.27	005 87 477 78
33x33	1.27	005 87 478 97
35x35	1.27	005 87 479 13
36x36	1.27	005 87 479 37
<hr/>		
15x15	1.5	005 87 477 82

## 2. QFP Components

Component	Pitch mm	Positioning Template
TQFP 100	0.5	005 87 478 44
TQFP 128	0.5	005 87 549 82
QFP 176	0.5	005 87 478 69
QFP 208	0.5	005 87 478 40
QFP 240	0.5	005 87 478 67
QFP 52	0.65	005 87 479 90
QFP 80	0.65	005 87 548 75
QFP 100	0.65	005 87 479 24
QFP 112	0.65	005 87 478 85
QFP 160	0.65	005 87 478 38
QFP 64	0.8	005 87 479 82
QFP 80	0.8	005 87 478 42

## 3. PLCC Components

Component	Pitch mm	Positioning Template
PLCC 20	1.27	005 87 548 08
PLCC 28	1.27	005 87 548 09
PLCC 44	1.27	005 87 548 10
PLCC 52	1.27	005 87 548 11
PLCC 68	1.27	005 87 548 12
PLCC 84	1.27	005 87 548 13



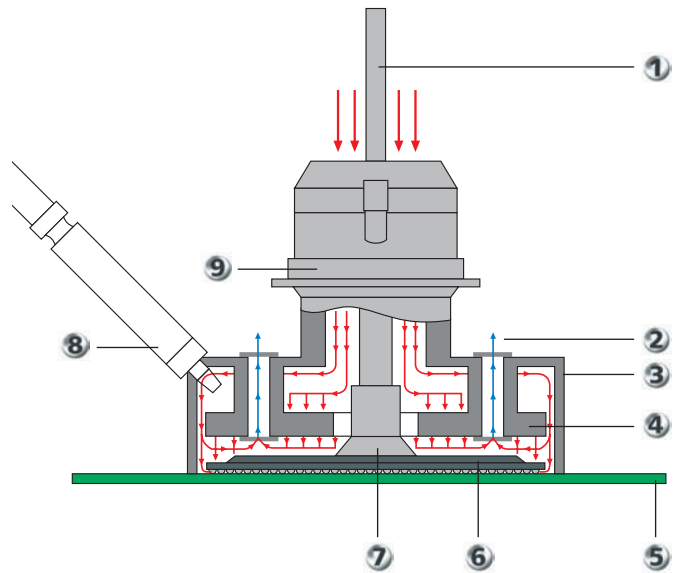
Note:  
Printing stencils for many components on request!



# Hot air nozzles for WQB 3000 OPS + WQB 3000

The patented hot air nozzles of the WQB rework stations, coupled with digital control of the hot gas temperature and its flow rate provide an even convective heating of the component. This in turn ensures repeatability of the reflow process. The drawing to the right illustrates the the reflow process.

- ① "Vacuum Lift" for automatic take off of the component at the end of the desoldering process
- ② Airflow outlet
- ③ Nozzle housing
- ④ Dash plate  
The advantageous use of the "swim-in" effect by BGAs is exploited by contact less heating of the module
- ⑤ Circuit board
- ⑥ BGA component
- ⑦ Suction insert
- ⑧ Temperature sensor  
Due to the arrangement of this sensor as near as possible to the component an effective temperature regulation is obtained, which prevents a thermal overloading of the component.
- ⑨ Mounting ring  
For easy change of nozzle, a tool is provided to enable hot nozzle changes.



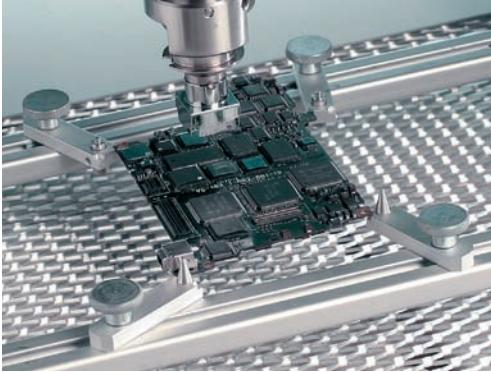
Overview of the hot air nozzles for the WQB 3000 OPS + WQB 3000

Order No.	Nozzle Housing Inside mm x mm	Nozzle Housing Outside mm x mm
005 87 479 47	7.6 x 7.9	8.6 x 8.9
005 87 479 43	6.5 x 6.5	7.5 x 7.5
005 87 479 45	8.5 x 8.5	9.5 x 9.5
005 87 479 61	8.5 x 10.6	9.5 x 11.6
005 87 549 67	10 x 10	11 x 11
005 87 478 48	12 x 12	13 x 13
005 87 479 04	13.5 x 13.5	14.3 x 14.3
005 87 479 35	15.5 x 15.5	16.5 x 16.5
005 87 478 93	15 x 11	16 x 12
005 87 548 36	18.5 x 10	19.5 x 11
005 87 479 77	15.5 x 23.5	16.5 x 24.5
005 87 478 33	18 x 18	20 x 20
005 87 547 70	21 x 21	23 x 23
005 87 548 20	22 x 22	24 x 24
005 87 477 64	25 x 25	27 x 27
005 87 479 93	27 x 23	29 x 25
005 87 478 50	27 x 27	29 x 29
005 87 479 27	29 x 29	31 x 31
005 87 479 99	28 x 32	30 x 34
005 87 479 06	33 x 33	35 x 35
005 87 548 87	35 x 35	37 x 37
005 87 477 53	37 x 37	39 x 39
005 87 478 71	39.5 x 39.5	41.5 x 41.5
005 87 478 74	42 x 42	44 x 44
005 87 549 03	45 x 11	47 x 13
005 87 549 05	45 x 26	47 x 28
005 87 477 63	46 x 46	48 x 48
005 87 479 16	47 x 47	49 x 49
005 87 479 41	49 x 49	51 x 51
005 87 557 49	55 x 45	57 x 47
005 87 479 85	57 x 18.5	59 x 20
005 87 557 50	70 x 60	72 x 62



Special hot air nozzles available on request

## Accessories



### Clamping set for circuit boards

Universal accessory for the circuit board holder, which allows the adaptation of the most difficult circuit board geometry's.

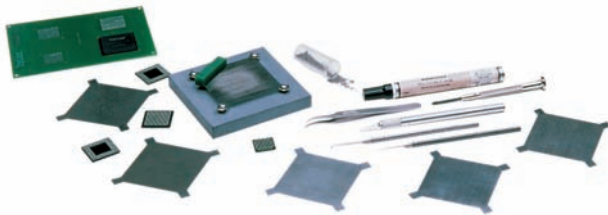
Order No. 5 87 549 24



### NQ nozzle adapter

This adapter allows the use of the Weller NQ/ND hot gas nozzle family in the soldering head

Order No. 5 87 549 70



### WPRB 1000 Reballing kit for Plastic BGA components

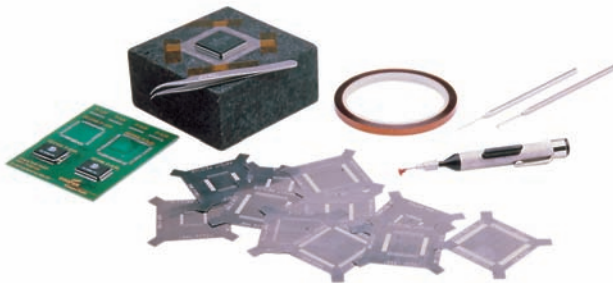
A simple and convenient way to replace solder balls on P-BGA components.

Once the P-BGA has been thoroughly cleaned the component is lined up with a printing screen such that the sites of the solder balls register with the holes in the screen. Eutectic solder paste is then printed onto the component using a spatula. The solder is then reflowed using hot air from a weller rework station such as the WHA 300, WHA 700 or WHA 2000 allowing dimensionally correct solder balls to form. Alternatively instead of printing solder paste onto the component solder balls can be used and reflowed in the same way.

### The WPRB1000

#### reballing kit contains:

- 6 screening templates for the most common BGA pitches 1.5 mm, 1.27 mm and 1 mm (Full- and staggered matrix)
- Template clamping fixture
- Spatula and squeegee
- 1 dummy BGA for training
- Precision tweezers, screwdriver and flux pen
- Eutectic solder balls (Ø 0.76 mm for pitch 1.5 mm and 1.27 mm)
- Rugged storage box
- Illustrated instruction manual
- Kapton tape



### WLSK 1000 Lead Straightening Kit for QFPs

This is a convenient and easy-to-use repair kit to realign bent and deformed gull wing connections on QFP components.

Kapton adhesive tape holds the chosen template on the granite work surface. The damaged component is placed into the alignment template using the vacuum pick-up tool.

Leads are straightened perfectly into the pocket of the templates using the straightening probes or the tweezers.

More templates for nearly all common QFP components available on request!

### The WLSK 1000

#### Lead straightening kit contains:

- Patented precision alignment templates for the most commonly used QFP's
- Lab grade granite surface plate
- Precision tweezers
- Vacuum pick-up tool
- Kapton tape
- Rugged storage case
- Illustrated instruction manual

## WQB 3000 OPS

### Consists of:

- Base unit with top heater, bottom heater, control electronics and pneumatic unit
- Positioning unit with digital camera and telecentric objective
- Circuit board holder with fine adjustment in x- and y-direction
- Illumination for soldering head
- Temperature sensor PT 100
- Push rod for bottom heater
- Nozzle change tool
- 5 pieces suction insert Ø 4.5 mm
- 5 pieces suction insert Ø 10 mm
- Mains cable
- Software "WQB 3000 CONTROL" and "WQB OPS"
- Serial interface cable
- Calibration tool
- 3 changeable vacuum pick ups
- 2 m connecting tube for compressed air
- Instruction manual

### Order No.

**005 33 516 99**  
**(UK: 005 33 513 99)**

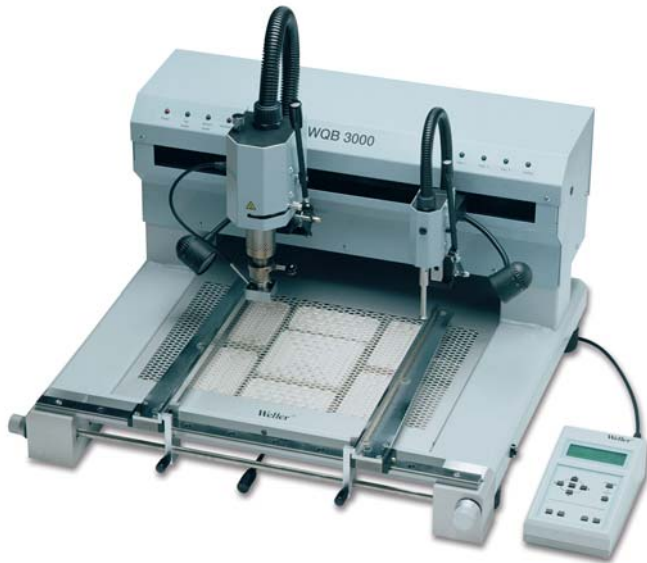
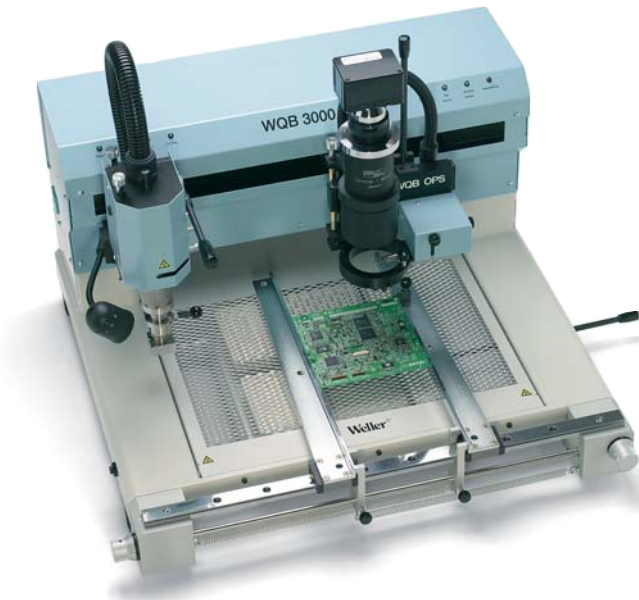
## WQB 3000

### Consists of:

- Base unit with bottom heater, soldering head, placement head, control electronics and pneumatic unit
- Circuit board holder with precision drive in x and y direction
- Lighting for soldering head and placement head
- Programming unit with RS-232 connecting cable
- Temperature sensor PT 100
- Push rod for bottom heater
- Nozzle change tool
- 5 pc. vacuum inserts Ø 4.5 mm
- 5 pc. vacuum inserts Ø 10 mm
- Reducer insert for the vacuum pickup
- Mains cable
- 2 m connecting tube for compressed air
- Instruction manual
- Software "WQB 3000 CONTROL" for the optional use of the system with PC

### Order No.

**005 33 506 99**  
**(UK: 005 33 503 99)**



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