Advance Package Rework Systems
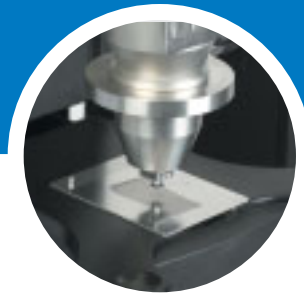
OKi

OK International has been a leading manufacturer of tools for the electronics assembly work bench for almost 60 years. And, as the industry has evolved, our rework and repair tools have grown to keep up with increasingly sophisticated packages. Now, our previously Metcal branded APR-5000 Series features the OK International brand logo.

While the name on the product has changed, these are the same systems that are designed by working closely with component suppliers and customers to develop powerful, user friendly systems and process solutions.

In fact, now, all of our products feature the OK International name. The APR-5000 Series is part of our family of complementary products that also includes soldering, benchtop fume extraction and fluid dispensing systems. Our systems are all developed to incorporate innovative designs, professional performance and ease of use.
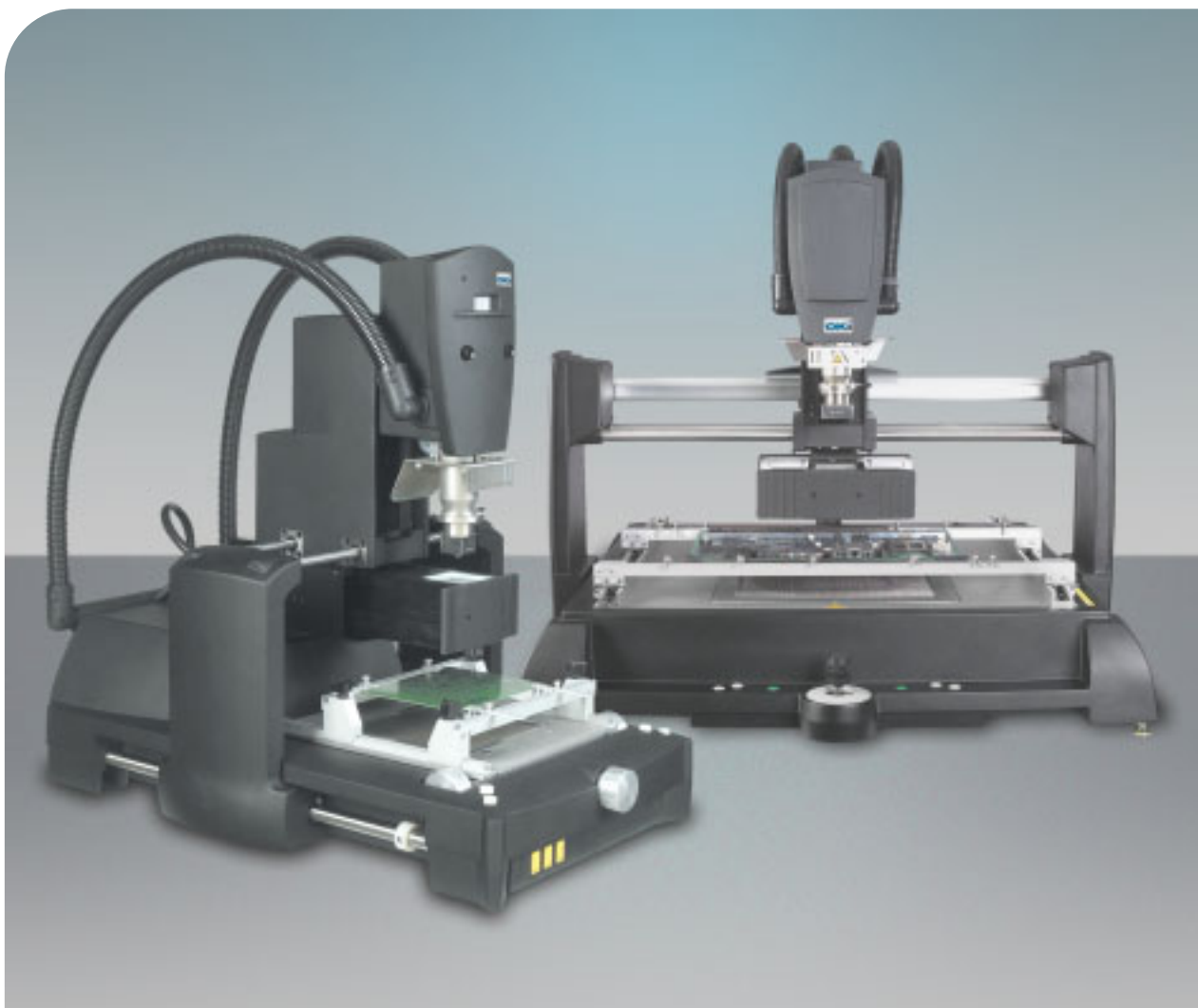
Known. Trusted. Quality. That's OK International. With decades of experience we are committed more than ever to provide customer driven solutions and the reliable products you demand.

Page

*Contents of this brochure subject to change without notice.*

Precision Array Package Rework

The APR-5000 Series Array Package Rework Systems incorporate state-of-the-art vision, and closed-loop time, temperature and airflow control. Precision placement and powerful software make the rework of complex array packages easy, fast and reliable.

Economical and easy-to-use, the APR-5000 Series Array Package Rework Systems deliver best-in-class BGA/CSP functionality with professional performance at an affordable price. All machines incorporate the ideal combination of hardware features and automated software necessary for reworking today's array packages.

Easy-to-program multi-lingual software manages the five stages of the reflow profile: pre-heat, soak, ramp, reflow and cooling. In addition, board temperature can be monitored using integrated flying thermocouples. Real-time adjustments can be made to all parameters while the profile is running.
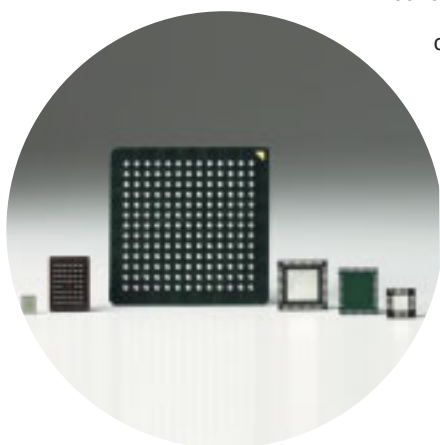
To help guarantee uniformity and higher process yields, the APR-5000 Series employs a single reflow/placement head that moves to the correct position for rework, allowing the PCB to remain stationary during the process. Plus, the PCB is centralized relative to the pre-heaters to provide superior uniformity of heating during rework.

The enhanced software is instructive and intuitive, walking the engineer through the steps of process development and then instructing the operator to ensure consistent, repeatable execution of the automatic profile functions

Lead-Free Compatible

As the implementation of lead-free assemblies intensifies, the APR-5000 Array Package Rework Systems have the power, size and sophistication to meet the required higher, cost-sensitive performance criteria.

The innovative OK International single reflow/placement head design helps achieve a consistently small Delta T across the board and the component. Thermal damage is precluded due to the system's precisely controlled pre-heaters; lead-free profiles can be quickly developed via the system's five thermocouples; and closed-loop, computer controls and intuitive software help operators maintain the ideal process from start to finish.

The APR-5000 Array Package Rework Systems provide full convection in both reflow heater and pre-heaters to provide fast ramp and precise peak reflow temperature without thermal damage to sensitive components unsuitable for heating above 240°C. And with four heating zones and one cooling zone, the precise profiles needed for successful soldering/desoldering of lead-free packages are easily delivered.
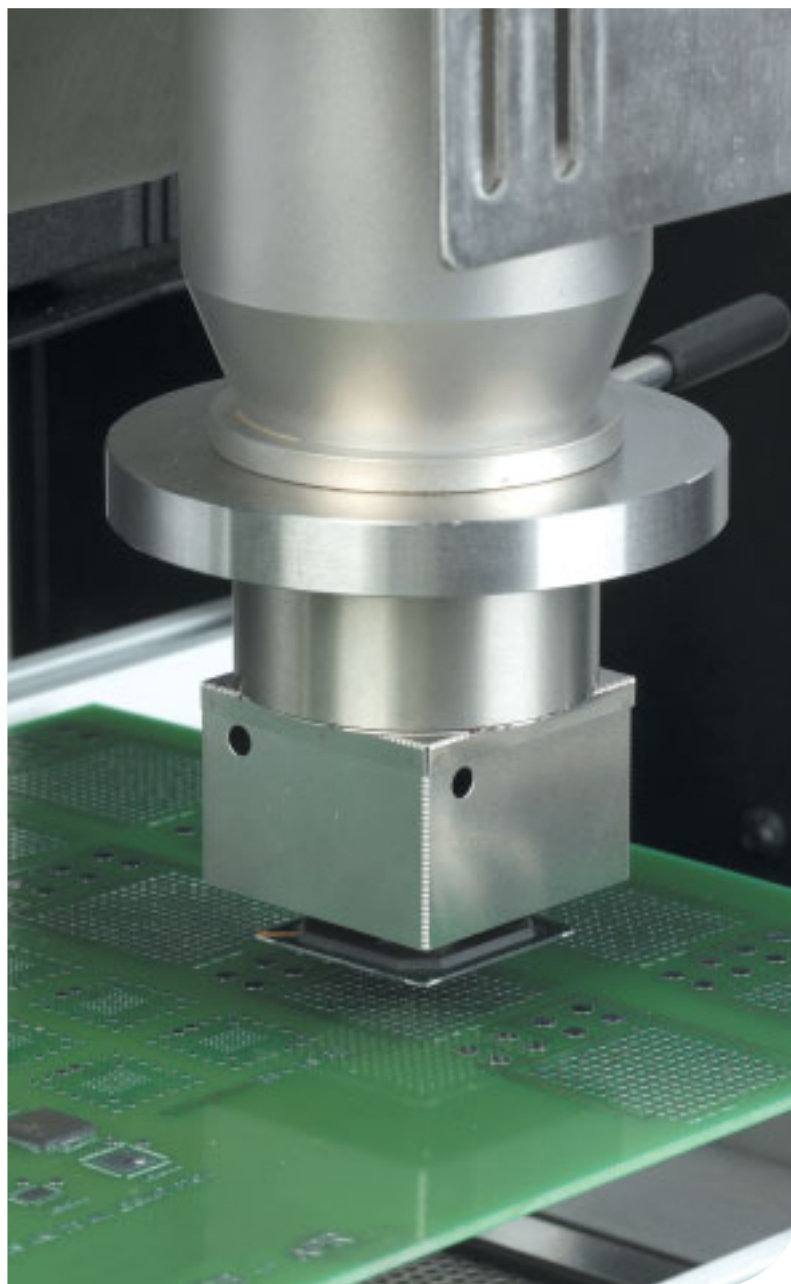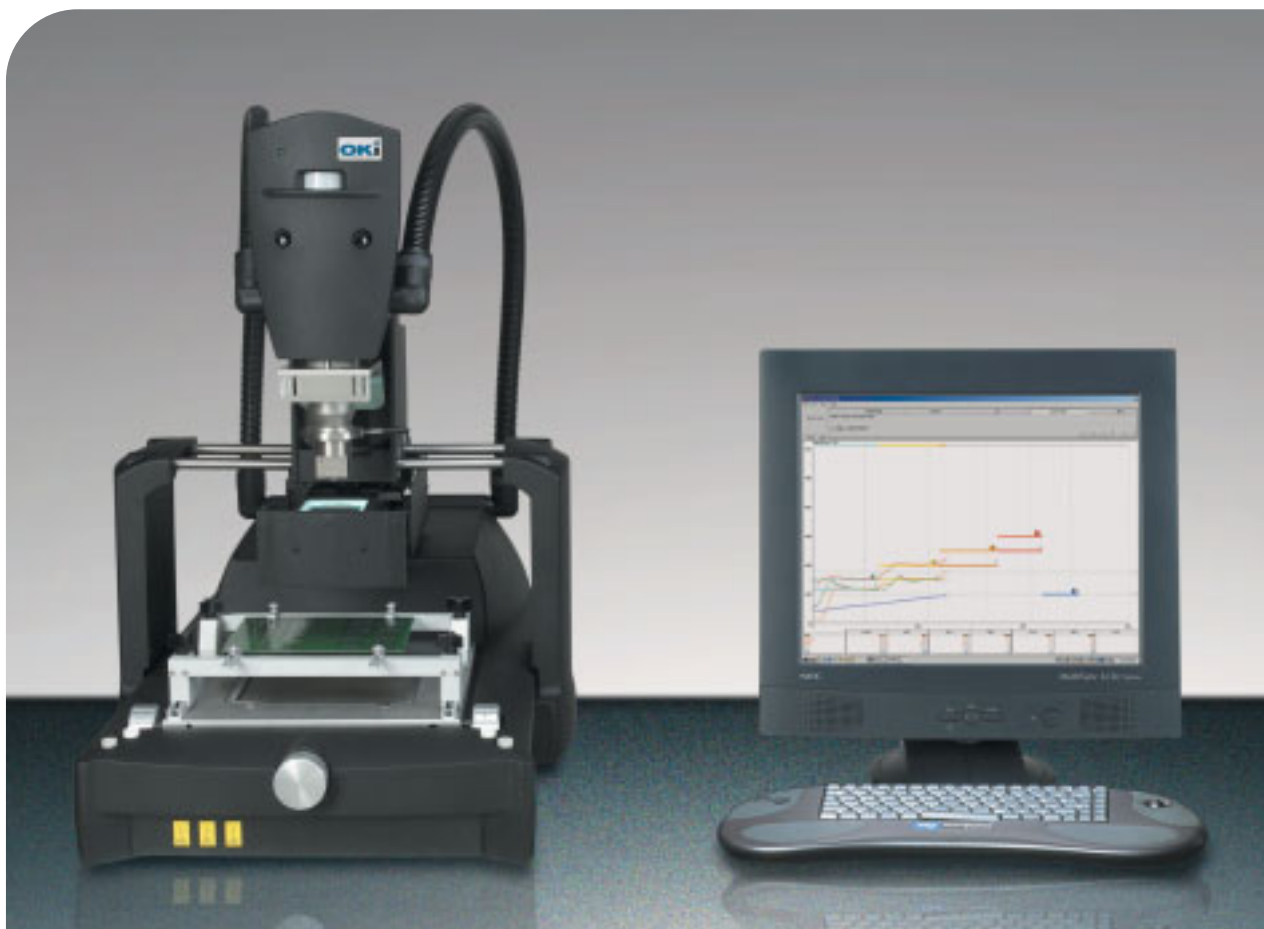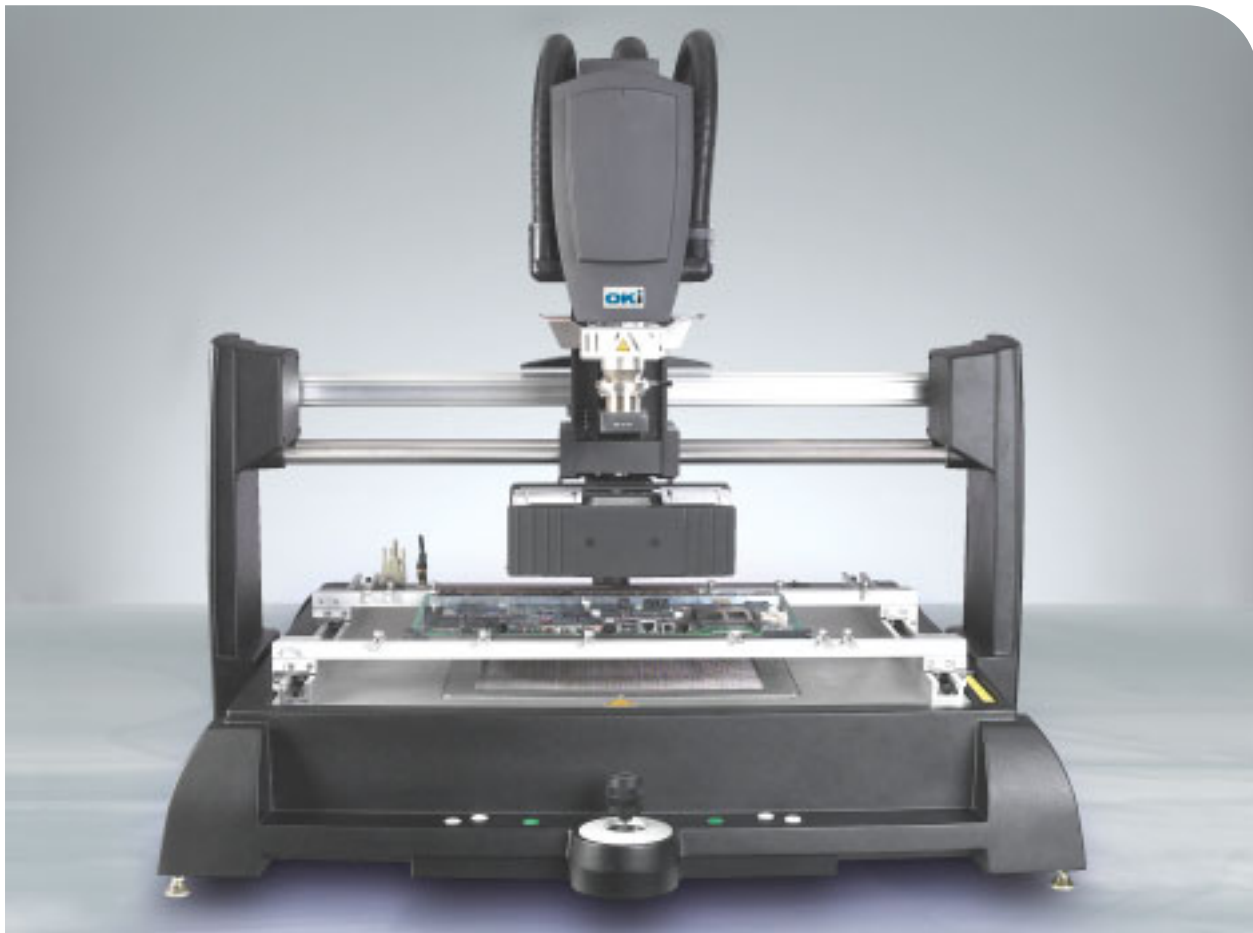
APR-5000 Array Package Rework System

Design and functionality come together in the compact and powerful APR-5000 Array Package Rework System. This system provides closed-loop control, optimized vision and precise component placement on a compact platform of 19" x 30" (483mm x 762mm).

Capable of handling boards up to 9" x 15" (229mm x 381mm), with a placement accuracy to 0.001" (0.025mm) and interconnection pitches as low as 0.012" (0.3mm), the APR-5000 is ideal for reworking smaller assemblies such as cell phones and laptop computers.

In addition, the APR-5000 Array Package Rework System uses standard line voltages and self contained pumps rather than special wiring and shop air. This allows the system to be set up and moved to any bench, without having to be fitted/plumbed in by an engineer. The system also offers N2 as a standard software option, however, a nitrogen supply is required.
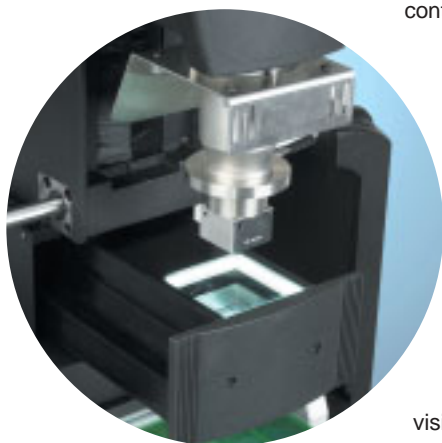
The system also incorporates OK International's exclusive integral vision system that makes viewing, aligning and accurately placing a component easy by allowing operators to simultaneously view the topside of the PCB and a superimposed image of the underside of the component. Then, with micrometer adjustment, images can be accurately aligned in the X, Y & Theta axes prior to placement. In addition, integrating the vision system with the machine's software eliminates the need for multiple monitors.

APR-5000-XLS Array Package Rework System

The APR-5000-XLS Array Package Rework System provides large board capability with small board precision. This system performs precise, cost effective rework of the widest range of PCBs and component types, from large boards up to 24.5" x 24.5" (622mm x 622mm) to components down to 0.020" x 0.010" (0.50mm x 0.25mm).

The flexible APR-5000-XLS System incorporates dual stage pre-heaters and has the thermal capacity and control to execute precise profiles of both large and small PCBs, delivering uniform temperature control horizontally, across the surface of PCBs up to 0.25" (6.35mm) thick, and vertically between the die and ball of the reworked component.

Motorized X, Y, Z adjustments speed placement and help ensure process repeatability. In addition, motorized Theta axis provides 360° rotation to simplify component orientation. Together, these advanced controls reduce operator fatigue, improve placement accuracy and provide process consistency.

Featured on the APR-5000-XLS Array Package Rework System is an innovative Split Vision System, which allows operators to view the opposite corners of a component, including splitting on rectangular components, with the necessary magnification to make its placement and registration fast and accurate.

Nozzles

A comprehensive range of standard reflow nozzles available to suit the most common array packages is available. In addition, OK International offers the flexibility of custom manufactured nozzles for unusual or odd shaped components. Please contact your local OK International representative for details.

Reflow Nozzles

Part No.	Description	
APR-NK	APR-5000 Nozzle Kit (*includes 1 of each)	
APR-NK-CSP	APR-5000 CSP and Micro SMD Nozzle Kit (**includes 1 of each)	
NZA-030-Round	APR Reflow Nozzle	3mm I/D (for small components)
NZA-490-490*	APR Reflow Nozzle	49mm x 49mm
NZA-450-450	APR Reflow Nozzle	45mm x 45mm
NZA-470-470-CGA	APR Reflow Nozzle	47mm x 47mm Column Grid Array
NZA-555-555-CGA	APR Reflow Nozzle	55.5mm x 55.5mm Column Grid Array
NZA-400-400*	APR Reflow Nozzle	40mm x 40mm
NZA-350-350*	APR Reflow Nozzle	35mm x 35mm
NZA-350-350-CGA	APR Reflow Nozzle	35mm x 35mm Column Grid Array
NZA-355-455-CGA	APR Reflow Nozzle	35.5mm x 45.5mm Column Grid Array
NZA-300-300	APR Reflow Nozzle	30mm x 30mm
NZA-270-270*	APR Reflow Nozzle	27mm x 27mm
NZA-230-230*	APR Reflow Nozzle	23mm x 23mm
NZA-200-200**	APR Reflow Nozzle	20mm x 20mm
NZA-180-180***	APR Reflow Nozzle	18mm x 18mm
NZA-150-150**	APR Reflow Nozzle	15mm x 15mm
NZA-130-130***	APR Reflow Nozzle	13mm x 13mm
NZA-100-100***	APR Reflow Nozzle	10mm x 10mm
NZA-080-080**	APR Reflow Nozzle	8mm x 8mm
NZA-060-060***	APR Reflow Nozzle	6mm x 6mm
NZA-080-095***	APR Reflow Nozzle	8mm x 9.5mm
NZA-250-290	APR Reflow Nozzle	25mm x 29mm

(*** included in both kits)

Component Stenciling Templates

OK International has designed a unique tool, Component Stenciling Templates, for printing on the underside of components. This easy procedure is designed for use on PBGA, CBGA, CSP balled devices as well as Land Grid Array (LGA) components. This is an ideal process for small components and situations where traditional stencil access is limited by the close proximity of adjacent components.

Component Stenciling Templates

| Part No.	Array Package
BST-169	169 Full Matrix Array
BST-225	225 Full Matrix Array
BST-256	256 Full Matrix Array
BST-256P	256 Perimeter Array
BST-256FP	256 Fine-Pitch Full Matrix Array
BST-272P+16	272 Perimeter Array With 16 Inner
BST-303	303 Full Matrix Array
BST-324	324 Full Matrix Array
BST-352P	352 Perimeter Array
BST-357	357 Full Matrix Array
BST-492	492 Full Matrix Array
CST-46	46 Ball Micro BGA
BRP-LDA16A	NSC LLP 16 Pin Dual In-Line
BRP-LQA16A	NSC LLP 16 Pin Quad
BRP-LQA24A	NSC LLP 24 Pin Quad
BRP-LQA44A	NSC LLP 44 Pin Quad

Dip Transfer

This process involves dipping a component into gel flux, depositing an exact amount of flux. This process is quick, consistent and clean, and negates the need to clean after reflow. Available for both solder balled and leaded devices. All kits are supplied with a metal spatula.

Dip Transfer Accessories

Part No.	Description
DTP-BGA	Set of 3 plates, apertures 28, 35 & 45mm, depth 0.012" (0.30mm)
DTP-CSP	Set of 3 plates, apertures 10, 16, & 21mm, depth 0.006" (0.15mm)
DTBK-USMD	Kit, uSMD Flux Transfer Blocks, set of 2 blocks, depth 0.003" (0.08mm) and 0.004" (0.10mm)
DTBK-FC	Kit, Flip Chip Flux Transfer Blocks, set of 2 blocks, depth 0.001" (0.025mm) and 0.002" (0.051mm)
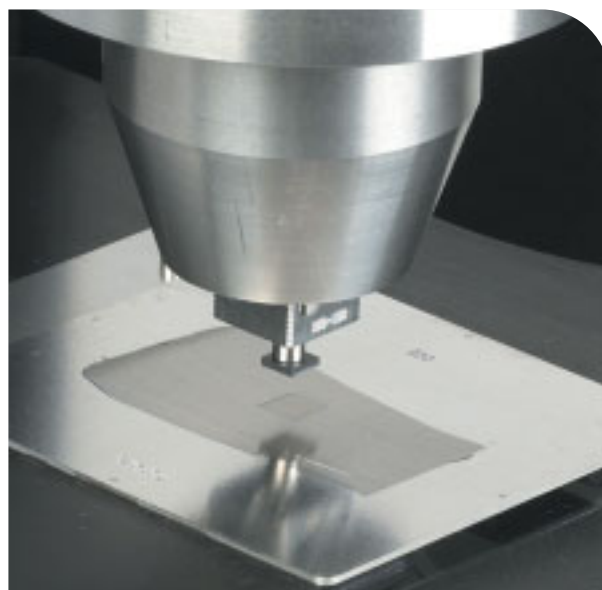
Tape Feeder

Picking up small surface mount components with tweezers is not practical and may damage the component. This is a unique way of presenting small components to a rework machine.

Tape Feeder

Part No.	Description
TF-1T	Tape Feeder, Micro SMD with thumbwheel
TF-2T	Tape Feeder, 0603 and 0402 with thumbwheel
TF-3T	Tape Feeder, 0201 with thumbwheel

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Systems

APR-5000
100-240 VAC Array Package Rework System

APR-5000-XLS
200-240 VAC Array Package Rework System

APR-5000-XL
200-240 VAC Array Package Rework System
Systems will be configured with desktop PC and monitor. Final pricing
will depend on configuration and language version.

Systems Include

VNZ-19	Vacuum Pick-Up Nozzle 19mm O/D**
VNZ-12	Vacuum Pick-Up Nozzle 12mm O/D
VNZ-08	Vacuum Pick-Up Nozzle 8mm O/D
VNZ-05	Vacuum Pick-Up Nozzle 5mm O/D
VNZ-03	Vacuum Pick-Up Nozzle 3mm O/D
VNZ-01	Vacuum Pick-Up Nozzle 1mm O/D
FS-APR	PCB Support Finger Short (4 included)*
FSS-APR	PCB Support Finger Short (8 included)**
FSL-APR	PCB Spring Support Finger Long (4 included with APR-5000, 8 with APR-5000-XLS/XL)
UBS-APR	Under Board Support*
UBS-APR-XL	Under Board Support**
APR-TC3	Color Fine Gauge Thermocouples (includes 3)*
APR-TC5	Color Fine Gauge Thermocouples (includes 5)**
19782	Adjustable BGA Centering Nest**
20987	Adjustable CSP Centering Nest
20534	Squeegee Blade Holder for Printing
SOFT-APR-5000	Installation Software*
SOFT-APR-5000-XL	Installation Software**
Cables	Power, Communication & Video Cables

(*APR-5000, ** APR-5000-XLS/XL)

Optional Accessories

FS-APR-2	PCB Support Finger Short (Pack of 2)
FL-APR-2	PCB Support Finger Long (Pack of 2)
FSL-APR-2	PCB Spring Support Finger Long (Pack of 2)
FSS-APR-2	PCB Spring Support Finger Short (Pack of 2)
FLS-APR-2	Large PCB Finger Short (Pack of 2)
FLL-APR-2	Large PCB Finger Long (Pack of 2)
FLSS-APR-2	Large PCB Spring Finger Short (Pack of 2)
FLSL-APR-2	Large PCB Spring Finger Long (Pack of 2)
UBS-APR	Under Board Support APR-5000
UBS-APR-XL	Under Board Support APR-5000-XL
APR-DK1	Demonstration PCB with BGA & CSP Component Kit
APR-DK2	Demonstration PCB with BGA & CSP Component Kit, includes clear PCB for alignment
PF-1	Print Preparation Plate
VAC-P100	Self-adhesive plates for removal of non-uniform components
APR-LRK	PCB Large Rail Kit – Fits boards up to 12" x 12" (30.5cm x 30.5cm)

Technical Specifications

	APR-5000	APR-5000-XLS/XL
Input Voltage	100-240 VAC, 50/60 Hz Single Phase	200-240 VAC, 50/60 Hz 20 Amp Single Phase
Power Consumption		
System Total	2200 W	3500 W
Pre-Heater	1400 W	2800 W
Inner Zone		1400 W
Outer Zone		2800 W
Reflow Heater	550 W	550 W
Temperature Control Type	Closed-Loop Control (RTD Sensors)	Closed-Loop Control (RTD Sensors)
Maximum Source Temperature		
Reflow Head	450°C (842°F)	450°C (842°F)
Pre-Heater	350°C (662°F)	350°C (662°F)
Airflow		
Control	Pre-Set to 8,16 & 24 l/min	Pre-Set to 8,16 & 24 l/min
Supply	Self-Contained Pump	Self-Contained Pump
Nitrogen Input	Standard Feature	Standard Feature
Component Handling		
Maximum Size	2.2" x 2.2" (56mm x 56mm)	2.2" x 2.2" (56mm x 56mm)
Minimum Size	0.020" x 0.010" (0.51mm x 0.25mm)	0.020" x 0.010" (0.51mm x 0.25mm)
Maximum Weight	55g (1.94oz)	55g (1.94oz)
PCB Handling Capability		
Maximum Size	15" x 9" (381mm x 229mm)	24.5" x 24.5" (622mm x 622mm)
Rework Area	9" x 12" (229mm x 305mm) 12" x 12" (305mm x 305mm) w/APR-LRK Large Rail Kit	22.5" x 24.5" (572mm x 622mm)
Maximum Thickness	0.25" (6mm)	0.25" (6mm)
Vision		
Maximum Field of View	1.4" x 1.4" (35mm x 35mm)	2.2" x 2.2" (55mm x 55mm)
Optional Split Field (APR-5000-XLS only)	Not Available	Corner crossover on large component
System Dimensions		
W x D x H	19" x 30" x 30" (483mm x 762mm x 762mm)	36" x 36" x 33" (914mm x 914mm x 838mm)
Weight	130lbs (60Kg)	220lbs (100Kg)
System Warranty	1 Year (Excluding Consumables)	1 Year (Excluding Consumables)
Agency Approvals	CE cETLus	CE cTUVus GS

OK International provides solution based technologies to electronics manufacturing industries throughout the world. Through our sales, service and distribution centers located in North America, Europe and Asia we are able to provide seamless, proactive expertise and support to our customers worldwide.

Wherever industrial manufacturing facilities are located, OK International's global network of expertly trained distributors is there, to supply essential technical support and advanced process solutions.

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