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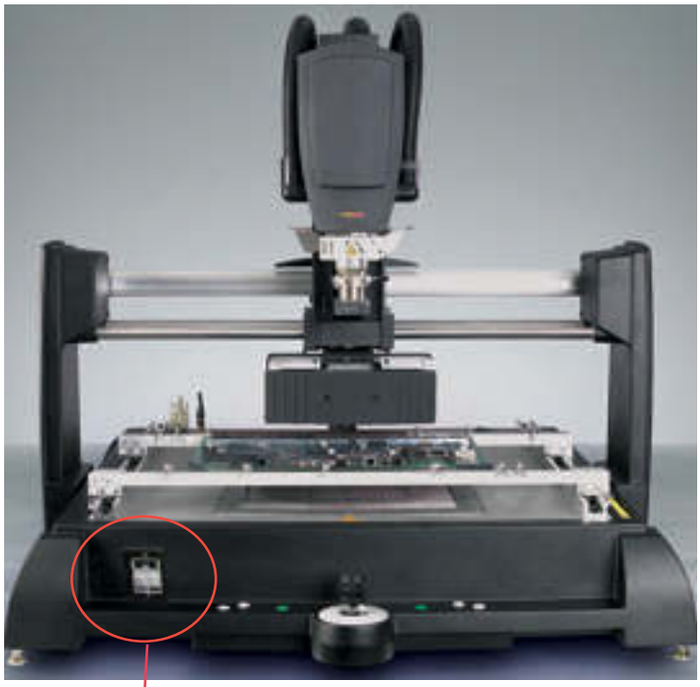
APR-5000-XL/-XLS
Advanced Package Rework System

The APR-5000-XL Advanced Package Rework System provides 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" (0.5mm x 0.25mm).

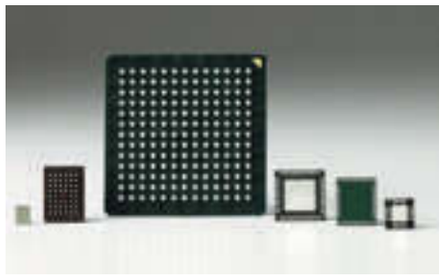
The flexible APR-5000-XL System incorporates dual stage pre-heaters and has the thermal capacity and control to execute precise profiles of both large and small PCBs, delivering uniform temperature control horizontally, across the surface of PCBs up to 0.25" (6.35mm) thick, and vertically between the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

Featured on the APR-5000-XL Advanced 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.







New circuit breaker / power switch with easy front access



Improved performance

New features:

- New dual simultaneously operating subzones provides additional power for faster and safer rework operations.
- New software enables fast and easy profiling
- New dual subzone design speeds up the process while allowing the operating temperatures to remain lower protecting the component and PCB

Key benefits:

- Increased Productivity
- Precise thermal control across critical assembly regions
- Reduction of rework cycle time protects the component under rework from thermal damage.
- Better management of the narrow lead-free process window without reaching excessive peak temperatures that damage components, connectors, other solder joints and the PCB substrate

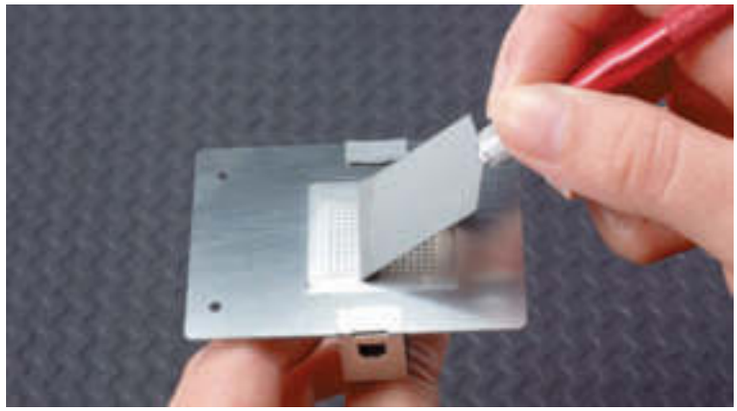
APR-5000-XLS System configurations and technical specifications on pages 42-43

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Accessories

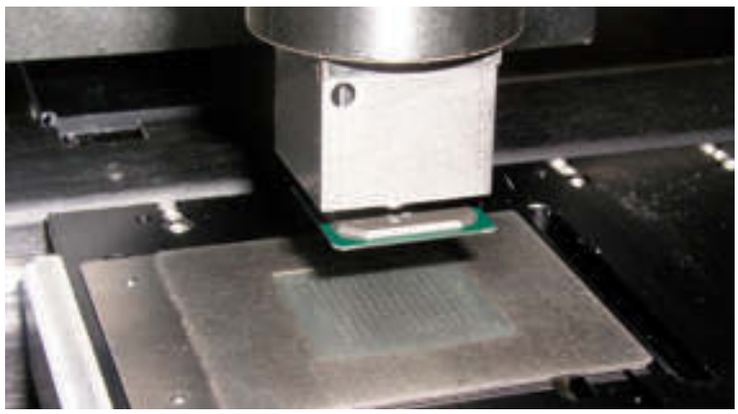
Component Stenciling Templates

Metcal 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.



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. Ideally select a dip plate that is half the diameter of the solder balls on components.



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.



Training PCB Kit

The board includes chip resistors, LLP, Micro SMD, QFP, PLCC, Fusion Packs, BGA and POP components to provide a versatile demonstration tool. It has also been pre drilled to allow for thermocouple attachment. Details of nozzles and rework process for the relevant component are printed on the back of the PCB.

Nozzles

A comprehensive range of standard reflow nozzles available to suit the most common array packages is available. The reflow nozzle works with vacuum pickup. The tweezer nozzle works with devices with limited pick up area or multilayer structure by providing mechanical tweezer action pickup instead of vacuum pickup e.g. PoP, sockets, connectors, inductors, potentiometers and through-hole components.



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Nozzles Tips & Rubber Tips

Placement Nozzle Tips

The new Precision Nozzles (PNZ) are for use with the Scorpion Precision Placement Head. These stainless steel nozzles are precision machined to ensure a secure vacuum connection with a variety of surface mount components

Part No.	DESCRIPTION	COMPONENTS
PNZ-03	Nozzle (0.013")	0201, 0402
PNZ-05	Nozzle with taper (0.018")	0402, 0603, 0805, 1206
PNZ-07	Nozzle (0.028")	0402, 0805, 1206
PNZ-07C	Nozzle ESD Compliant (0.028")	0402, 0805, 1206
PNZ-07C-ORING	Seal for PNZ-07C Nozzle, (Pack of 10)	
PNZ-10	Nozzle (0.039")	0805, 1206, 1210
PNZ-10C	Nozzle, ESD Compliant (0.039")	0805, 1206, 1210
PNZ-14	Nozzle (0.055")	1210, 1812, 1825
PNZ-24	Nozzle (0.094")	1812, 1825, SOT 89, SOMIC16+, SOIC 8+, PLCC 20
PNZ-36	Nozzle (0.141")	SOIC8+, PLCC18+, SOLIC16+
PNZ-36C	Nozzle, ESD Compliant (0.141")	SOIC8+, PLCC18+, SOLIC16+
PNZ-36C-ORING	Seal for PNZ-36C Nozzle, (Pack of 10)	
PNZ-50	QE Nozzle (0.5")	>.50"components, QFP's
PNZ-60	QF Nozzle (0.5")	>.50"components, QFP's
PNZ-70	Nozzle, ESD Compliant (0.5")	>.50"components, QFP's
PNZ-80	Nozzle, ESD Compliant, V-RING (0.5")	>.50"components, QFP's

Placement Nozzle Adaptor

PNZ-AD	Placement Head Z-axis adapter
PNZ-AD-ORING	Placement Head Z-axis. Adapter O-ring (Pack of 10)



Replaceable Rubber Tips

The RT10 rubber tip, used with the Scorpion fine placement head, offers outstanding quality and performance features. The pick-up tip has a relieved tip surface, which minimizes surface contact with the component. Precision tolerances of +/-0.025 to 0.050mm ensure a repeatable setup when changing tips, while embossed code numbers help line personnel with identification and control. Together with proprietary ultra-pure and antistatic rubber, the RT10 tip is ideal for component attachment.

PNZ-RT10-7XX	ESD Compliant Nozzle Body and (1) ESD Tip
PNZ-RT10-7XXT	RT10 Replaceable ESD Rubber Tip Only
PNZ-RT10-BODY	ESD Compliant Nozzle, Body Only

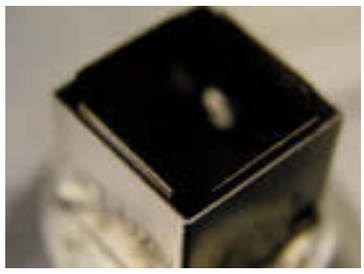


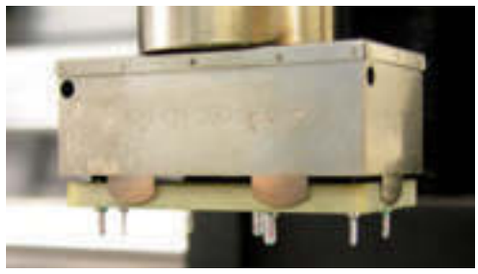
Part No. Body + Tip	Part No. Tip Only	X in	T in	ID in	X mm	T mm	ID mm
PNZ-RT10-700	PNZ-RT10-700T	0.025	0.010	0.004	0.635	0.266	0.101
PNZ-RT10-701	PNZ-RT10-701T	0.030	0.007	0.023	0.75	0.17	0.58
PNZ-RT10-702	PNZ-RT10-702T	0.039	0.010	0.029	1.00	0.25	0.75
PNZ-RT10-703	PNZ-RT10-703T	0.049	0.013	0.036	1.25	0.32	0.93
PNZ-RT10-704	PNZ-RT10-704T	0.059	0.012	0.047	1.50	0.30	1.2
PNZ-RT10-705	PNZ-RT10-705T	0.069	0.012	0.057	1.75	0.30	1.45
PNZ-RT10-706	PNZ-RT10-706T	0.079	0.012	0.067	2.00	0.30	1.7
PNZ-RT10-707	PNZ-RT10-707T	0.089	0.012	0.077	2.25	0.30	1.95
PNZ-RT10-708	PNZ-RT10-708T	0.098	0.012	0.086	2.50	0.30	2.2
PNZ-RT10-709	PNZ-RT10-709T	0.118	0.016	0.102	3.00	0.40	2.6
PNZ-RT10-710	PNZ-RT10-710T	0.138	0.016	0.122	3.50	0.40	3.1
PNZ-RT10-711	PNZ-RT10-711T	0.157	0.016	0.141	4.00	0.40	3.6
PNZ-RT10-712	PNZ-RT10-712T	0.177	0.016	0.161	4.50	0.40	4.1
PNZ-RT10-713	PNZ-RT10-713T	0.197	0.016	0.181	5.00	0.40	4.6

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Nozzles & Kits

Part No.	DESCRIPTION
BRP-KIT-LGA100-04	Full kit (3pcs) w/ base fixture, pattern & body plates for LGA100-0.4mm (also incl. clamp & squeegee)
BRP-KIT-BASE	BRP kit base fixture only
BRP-KP-LGA100-04	Kit plates (2pcs), pattern and body plates only (minus base) for LGA100-0.4mm
BRP-KIT-FUSION-216	Full kit (3pcs) w/ base fixture, pattern & body plates for Fusion pack 216 (incl. clamp & squeegee)
BST-256-100	Standard BST plate, clamp & squeegee, PBGA 256, 1.0mm pitch
BST-256-127	Standard BST plate, clamp & squeegee, PBGA 256, 1.27mm pitch
BST-388-127	Standard BST plate, clamp & squeegee, PBGA 388, 1.27mm pitch
BRP-KP-FUSION-216	Kit plates pattern & body plates only (minus base) for Fusion pack 216
TF-1T	Tape Feeder, Micro SMD with thumbwheel - FOR APR-5000-XL/-XLS ONLY
TF-2T	Tape Feeder, 0603 and 0402 with thumbwheel - FOR APR-5000-XL/-XLS ONLY
TF-3T	Tape Feeder, 0201 with thumbwheel - FOR APR-5000-XL/-XLS ONLY
TF-AT-SRS	Tape Feeder, Adjustable - FOR SCORPION REWORK SYSTEM ONLY
NZA-490-490*	APR Reflow Nozzle 49mm x 49mm
NZA-450-450	APR Reflow Nozzle 45mm x 45mm
NZA-400-400*	APR Reflow Nozzle 40mm x 40mm
NZA-350-350*	APR Reflow Nozzle 35mm x 35mm
NZA-300-300	APR Reflow Nozzle 30mm x 30mm
NZA-270-270	APR Reflow Nozzle 27mm x 27mm
NZA-250-290	APR Reflow Nozzle 25mm x 29mm
NZA-230-230*	APR Reflow Nozzle 23mm x 23mm
NZA-280-150	APR Reflow Nozzle 28 mm x 15 mm
NZA-200-200**	APR Reflow Nozzle 20 mm x 20 mm
NZA-180-180***	APR Reflow Nozzle 18 mm x 18 mm
NZA-150-150**	APR Reflow Nozzle 15 mm x 15 mm
NZA-130-130***	APR Reflow Nozzle 13 mm x 13 mm
NZA-100-100***	APR Reflow Nozzle 10 mm x 10 mm
NZA-080-095***	APR Reflow Nozzle 8 mm x 9,5 mm
NZA-080-080**	APR Reflow Nozzle 8 mm x 8 mm
NZA-060-060***	APR Reflow Nozzle 6 mm x 6 mm
NZA-030-ROUND	APR Reflow Nozzle 3mm ID round
NZA-TW-180-180	APR Tweezer Nozzle 18mm x 18mm
NZA-TW-150-150	APR Tweezer Nozzle 15 mm x 15 mm
NZA-TW-130-130	APR Tweezer Nozzle 13 mm x 13 mm
NZA-TW-100-100	APR Tweezer Nozzle 10 mm x 10 mm
NZA-TW-080-080	APR Tweezer Nozzle 8 mm x 8 mm
NZA-TW-060-060	APR Tweezer Nozzle 6 mm x 6 mm
NZA-555-555-CGA	APR Reflow Nozzle 55.5mm x 55.5mm (column grid array nozzle)
NZA-470-470-CGA	APR Reflow Nozzle 47mm x 47mm (column grid array nozzle)
NZA-355-455-CGA	APR Reflow Nozzle 35.5mm x 45.5mm (column grid array nozzle)
NZA-350-350-CGA	APR Reflow Nozzle 35mm x 35mm (column grid array nozzle)
DTP-BGA	Set of 3 plates, apertures 28, 35 & 45mm, depth 0.012" (0.30mm) used for 1.27mm pitch 30 Mil BGA balls (.76mm)
DTP-CSP	Set of 3 plates, apertures 10, 16 & 21mm, depth 0.006" (0.15mm) BGA/CSP used for BGAs with 12 Mil balls (.3mm dia)
DTP-40-8	8 Mil dip plate standard for 1mm pitch BGA with 20 Mil balls 0.02" (0.5mm)
DTBK-USMD	Kit, uSMD Flux Transfer Blocks, set of 2 blocks, depth 0.003" (0.08mm) and 0.004" (0.10mm) used for solder balls 6-8 Mil (.15-2mm dia)
DTBK-FC	Kit, Flip Chip Flux Transfer Blocks, set of 2 blocks, depth 0.001" (0.025mm) and 0.002" (0.051mm)
APR-NK	APR-5000 Nozzle Kit (*Includes 1 of each *** 1 included in both kits)
APR-NK-CSP	APR-5000 CSP and Micro SMD Nozzle Kit (**Includes 1 of each *** 1 included in both kits)







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APR-5000-XL/-XLS Part Numbers

Part No.	SYSTEMS DESCRIPTION
APR-5000-XLS-ML	200-240 VAC Advanced Package Rework System with Split Vision
APR-5000-XL-ML	200-240 VAC Advanced Package Rework System
Systems will be configured with desktop PC and monitor.	
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 (2.39mm / .094" internal & 3.17mm / .128" external)
VNZ-01	Vacuum Pick-Up Nozzle 1mm O/D (.76mm / .03" internal & 1.56mm / .06" external)
VNZ-005	Vacuum Pick-Up Nozzle 0.5mm OD (.25mm / .010" internal & 1.02-0.76mm / .04-.03" external)
FSS-APR	PCB Support Finger Short (8 included)
FSL-APR	PCB Support Finger Long (4 included with APR-5000, 8 with APR-5000-XLS/XL)
UBS-APR-XL	Under Board Support
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-XL	Installation Software
APR-XL-PHNK	Pre-Heater Nozzle Kit includes: Software, Pre Heater Nozzle 50mm, Pre Heater Nozzle 45mm, Pre Heater Nozzle 35mm, Pre Heater Nozzle, Base
Optional Accessories	
FS-APR-2	PCB Support Finger Short (Pack of 2)
FS-APR	PCB Support Finger Short (4 included)
FL-APR-2	Large PCB Support Finger Long for PCBs from 2.2mm to 6mm (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 for PCBs from 2.2mm to 6mm (Pack of 2)
FLL-APR-2	Large PCB Finger Long for PCBs from 2.2mm to 6mm (Pack of 2)
FLSS-APR-2	Large PCB Spring Finger Short for PCBs from 2.2mm to 6mm (Pack of 2)
FLSL-APR-2	Large PCB Spring Finger Long for PCBs from 2.2mm to 6mm (Pack of 2)
PF-1	Print Preparation Plate
VAC-P100	Self-adhesive plates for removal of non-uniform components
APR-TC3	Color Fine Gauge Thermocouples (includes 3)
AC-TCK-40-36	Thermocouple, 40 Gauge

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Technical Specifications

TECHNICAL SPECIFICATIONS	
	APR-5000-XLS/-XL
Input Voltage	200 - 240 VAC 50/60 Hz 25 Amp Single Phase
Power Consumption:	
System Total	5100 W
Pre-Heater:	
Inner Zone	1400 W
Outer Zone	2800 W
Reflow Heater	550 W
Temperature Control Type	Closed-Loop Control (RTD Sensors)
Maximum Source Temperature:	
Reflow Head	400°C (752°F)
Pre-Heater	350°C (662°F)
Airflow Control	Pre-Set to 8,16 &24 l/min
Supply	Self-Contained Pump
Nitrogen Input	Nitrogen capable for the top flow (requires 65psi or 4.6 bar)
Component Handling / Reflow Nozzles	
Maximum Size	55 mm x 55 mm (2.16" x 2.16") XL, XLS Larger reflow nozzles can be ordered, contact us.
Minimum Size	0.51 mm x 0.25 mm (0.020" x 0.010")
Maximun Weight	55g (1.94oz) or 84g (3oz) with VNZ-19
PCB Handling Capability	X x Y
Standard	622 mm x 622 mm (24.5" x 24.5")
Rework Area	X x Y
Head Adjustment	622 mm x 622 mm (24.5" x 24.5")
Aligned inner preheater and reflow heater	445 mm x 445 mm (17.5" x 17.5")
Maximum Thickness	6 mm (0.25")
Vision	40mmx 40mm (1.6" x 1.6") XL
Maximum Field of View	55mm x 55mm (2.2" x 2.2") XLS
Optional Split Field (APR-5000-XLS)	Corner crossover on large component
System Dimensions W x D x H	914 x 914 x 838 mm (36" x 36" x 33")
Weight	100 kg (220 lbs)
System Warranty	1 Year (Excluding Consumables)
Agency Approvals	CE, cTUVus, GS

Other Accessories	
APR-MRS-DEMOPCB	Training PCB
APR-MRS-DEMOKIT	Training PCB Kit with BGA, LGA and other components (see list below)

List of components included with the APR-MRS-DEMOKIT:

- 5 x res, zero Ohm, 0201SMR-PA-10K-0
- 5 x res, zero Ohm, 0402SMR-PA-10K-0
- 5 x res, zero Ohm, 0603SMR-PA-10K-0
- 5 x micro SMD, 4 bump, 0.5 mm pitch
- 5 x micro SMD, 5 bump, 0.5 mm pitch
- 5 x micro SMD, 8 bump, 0.5 mm pitch
- 5 x micro SMD, 10 bump, 0.5 mm pitch
- 5 x LLP LDA16A
- 5 x LLP, plastic, Quad 4x4x0.75 mm body,16LD, 0.5 mm pitch
- 5 x LLP, plastic, Quad 5x4x0.75 mm body 24LD, 0.5 mm pitch
- 5 x LLP, plastic, Quad 7x7x0.75 mm body 44LD, 0.5 mm pitch
- 4 x PBGA 27 mm 256 balls, 1.27 mm pitch
- 3 x PBGA 17 mm 256 balls, 1.0 mm pitch
- 1 x PBGA 35 mm 388 balls, 1.27 mm pitch
- 1 x POP Bottom 305 balls 12 mm, 0.5 mm pitch
- 1 x Top of POP 128 balls 12 mm, 0.65 mm pitch
- 4 x CVBGA (thin BGA) 97 balls 5 mm, 0.4 mm pitch
- 4 x LGA/MLF100 pin 12 mm fine pitch, 0.4 mm pitch
- 4 x PLCC 44 pin 16 mm, 1.27 mm pitch
- 4 x QFP 44 10 mm by 10 mm, 0.8 mm pitch
- 4 x QFP 100 14 mm by 20 mm, 0.65 mm pitch
- 4 x CTBGA 228 12 mm by 12 mm, 0.5 mm pitch
- 1 x fusion pack (combination 116 QFN & 100 QFP in one package .4 mm pitch)

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