MRS-1100A Modular Rework System

Key Features & Benefits

◗ Digital display for repeatable temperature settings and profile control
◗ Automatic control of the preheater for simple operation
◗ Easy profile creation for operator repeatability
◗ Integrated vacuum pickup for easy component removal
◗ Hand held or tool holder mounted for operator comfort
◗ Manual mode for quick setup
◗ External thermocouple for process setup and verification
◗ Digital controlled airflow for repeatable results
◗ X, Y, Z and Theta controls for component alignment
◗ Adjustable PCB holder for easy change outs
◗ Automatic vacuum lift off at the end of the cycle
◗ Password lockout of programmed profiles

The MRS-1100A Modular Rework System is an integrated convection rework system for the removal and reflow of BGA/CSP and SMT components.

The MRS-1100A is comprised of a convection tool, a preheater, an adjustable tool holder, and a free-standing board holder to create a manually assisted rework system. A series of nozzles, targeting a variety of applications round out the product offering for this system.

With standard features such as programmability, a digital display, program storage of up to 50 profiles, this system is not only versatile, but also easy and efficient to work with. A choice of board holders and accessories are available that make the system capable of handling multiple sizes of PCBs.

The MRS-1100A allows you the choice of using either the embedded profiling capability that can be configured to operate at a fixed temperature, or a four zone programming option. The unit also allows the temperature to be controlled either at the heat output (internal) or at the board (external). The "external" control function uses a thermocouple which can be placed on the board or a component.

The 4 components of the MRS-1100A are:

1. HCT-1000 Programmable Hand Held Convection Tool.

2. PCT-1000 Programmable Pre-heater.

3. ATH-1100A Adjustable Tool Holder.

4. BH-2000 Free standing board holder.

Part No.	Description
MRS-1100A	**Modular Rework System**

The 4 components of the MRS system can also be ordered separately.

HCT-1000 Programmable Hand Held Convection Tool

The HCT-1000 is a fully Programmable Hand Held Convection Tool offering **fast and easy removal and placement of SMT components.**

The HCT-1000 stands out as a versatile convection rework tool. It can be used on its own or as part of the MRS-1100A Modular Rework System for more complex applications.

The system comes equipped with a 5mm nozzle and nozzle adapter. In addition, a wide range of nozzles are available.

Key Features & Benefits

◗ Integrated vacuum pickup for easy component removal

◗ Profile creation for operator repeatability and storage for up to 50 user defined profiles

◗ Manual mode for quick setup

◗ External thermocouple for process setup and verification

◗ Hand-piece controls for heater and vacuum

◗ Programmable, digitally controlled airflow for repeatable results

◗ Multiple modes of operation: manual, 4 zone heating (with the MRS-1100A System)

◗ The HCT-1000 is connected to the PCT-1000 via a cable when used as part of the MRS System

◗ May be used with ATH-1100A Adjustable Tool Holder

Technical Specifications

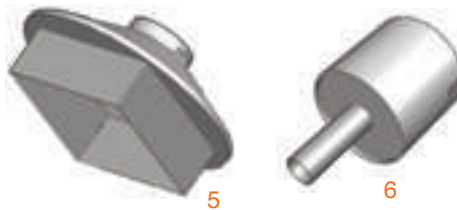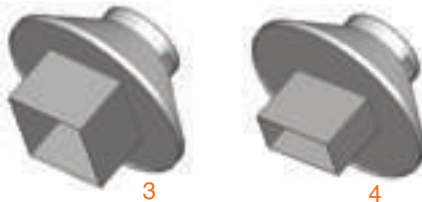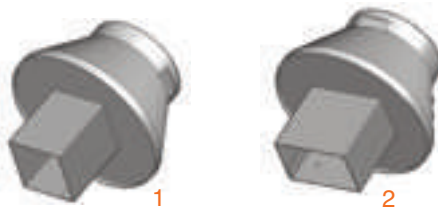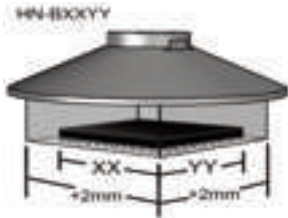|	
Size	229 x 178 x 152mm (9" x 7" x 6 ")
Weight	5.4kg (12 lbs.)
Rated Power	600 W
Input Voltage	100-240 VAC, 50/60 Hz
Storage	0°C to 50°C Temperature (32°F to 122°F)
Air Flow	5-25 l/minute
Source Temperature Range	Up to 450°C (840°F)
Vacuum Pump	15" Hg (381mm Hg)
Noise Level	<55 dBA

Part No.	Description
HCT-1000	Programmable Hand Held Convection Tool
Includes:	
HCT-PS1000	HCT-1000 Power Supply
HCT-HV1	Hand-piece with integral vacuum, cord and connector
HCTA-VC-KIT	Vacuum Cup kit, one of each * (see below)
HCTA-TH1	Hand-piece Tool Holder
HNA-1	Nozzle Adapter
HCTA-NW1	Nozzle Wrench
AC-TCK-36-36	Thermocouple 36 AWG, pack of 2
HCTA-CC	Communications Cable 4ft
HN-J0005	5mm ∅ nozzle

Accessories

HCT-FS2 1	
Footswitch, Dual, HCT-1000	
HCT-HTRASSY	
Heater Assembly	
AC-TCK-40-36	
Thermocouple 40 AWG, pack of 2	
HCTA-VC50-5 *	
Vacuum Cup, 3/16" (5.00mm), pack of 5	
HCTA-VC64-5 *	
Vacuum Cup, ¼" (6.4mm), pack of 5	
HCTA-VC80-5 *	
Vacuum Cup, 5/16" (8mm), pack of 5	
HCTA-VC11-5 *	
Vacuum Cup, 7/16" (11mm), pack of 5	

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HCT-1000 Programmable Hand Held Convection Tool

HN-BXXYY

HN Series Nozzles

A series of 14 Nozzles are available for use with the MRS-1000 / HCT-1000. The nozzles fit applications reworking components of all sizes from (including, but not limited to) BGAs, QFPs, LGAs, PLCC and SOIC. A custom nozzle program is also available.

Nozzle Measurement and Selection

The nozzle part number (the digits after the "B") represents the size of the component. 2mm have been added to each side of the internal nozzle dimension to allow for component access.

Part Number		Component Size	Components
HN-B0707	1	7mm X 7mm	CSP, LGA44
HN-B1010	1	10mm X 10mm	CSP, LGA178, LCC28
HN-B1414	1	14mm X 14mm	CSP, QFP, TQFP100
HN-B1408	2	14mm X 8mm,	CSP, SOIC24M
HN-B1515	3	15mm X 15mm	BGA
HN-B1818	3	18mm X 18mm	PLC44, CSP, TQFP100, BGA
HN-B2525	3	25mm x 25mm	BGA, PLCC68
HN-B1809	4	18.2mm X 8.5mm	SOLJ28, SOIC28M, TSOP32
HN-B2519	4	24.5mm X 18.5mm	QFP100, QFP80
HN-B2727	5	27mm X 27mm	BGA
HN-B3232	5	32mm X 32mm	BGA
HN-B3535	5	35mm X 35mm	BGA
HN-B4040	5	40mm X 40mm	BGA
HN-J0005	6	5mm $\varnothing$ Diameter	DISCRETE

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Nozzle Accessories

HCT-NC	7	Nozzle Carrier
HNA-1	8	Nozzle Adapter
HCTA-NW1	9	Nozzle Wrench

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Metcal offers a full custom program for nozzles not available within the standard offering shown above. Please contact us: www.metcal.com
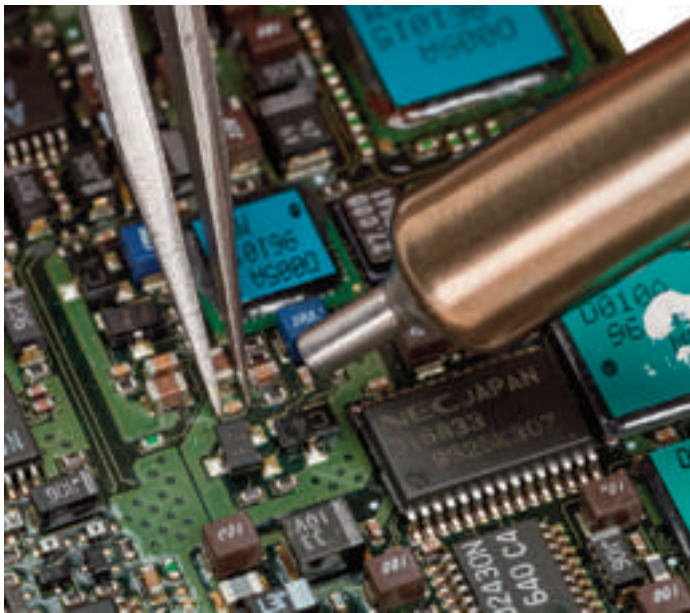
HCT2-120 Digital Hot Air Pencil

NEW PRODUCT

The new HCT2-120 Hot Air Pencil is the latest addition to Metcal's offering of convection rework tools. This digital handheld convection tool is **ideally suited for applications, which use smaller components and integrated circuits.**

As component miniaturization continues, the ergonomics of a pencil allow a user more freedom to access and rework components on the board without affecting adjacent parts.

Key Features & Benefits

◗ 120 Watt Ceramic Heater and Dual Stage Air Pump: Provides the power and performance needed to deliver the right amount of thermal energy.

◗ Digital Airflow and Temperature Controls: Two LED displays provide a graphical and numerical representation of the desired airflow and temperature.

◗ Fast Response and Performance: A microprocessor controlled, closed loop feedback system provides fast heating, precise and stable temperature control.

◗ Standby Mode: When the hand-piece is placed into the workstand, the temperature will drop increasing heater life.

◗ Universal Power Supply: Automatically senses the input line voltage and adjusts accordingly, which allows for worldwide operation without adaptors or a change in performance.

◗ Ergonomic and Light Weight Hand-Piece that feels like a pencil, with a rubber grip. Increases operator comfort

◗ Nozzles: Six nozzles (1.5 mm – 4.0 mm) are included in the unit with a nozzle holder inside the workstand.

◗ Easily Change Heaters and Nozzles: Both can be changed in seconds, as shown below:

HCT2-120 Digital Hot Air Pencil

Part No.		Description
HCT2-120		Digital Hot Air Pencil
Includes:		
HCT-HTR120	1	120W Easy Change Heater
HN-120KIT-6	2	Pack of 6 nozzles (1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5 mm and 4.0 mm)
HCT-WS120	3	Workstand with nozzle holder
AC-CP2		Heatproof nozzle removal pad (see page 8)

Technical Specifications

Ambient Operating Temperature	10 to 40°C
Input Line Voltage	100 – 240 VAC, grounded circuit
Input Frequency	50/60 Hz
Rated Power	75W
Air Flow	1.5 – 7.0 LPM
Noise Level	Typically under 52dBA at max airflow
Output Temperature Range	100°-450°C
Temperature Stability	10% of display value
Certifications / Markings	cNRTLus, CE, RoHS + WEEE
Surface Resistivity	105 Ω -109 Ω /sq
Power Supply Dimensions w x d x h	10.6 cm (4.2") x 21.3 cm (8.4") x 17.0cm (6.7")
Workstand Dimensions w x d x h	7.6 cm (3.0") x 16.8 cm (6.6") x 8.6 cm (3.4")
Weight of the Power Supply	5.8 lbs. (2.63 kg)
Weight of the Workstand	0.9 lbs. (.4 kg)

DIPs

SOICs

PLCCs

0201s

1210s

Other Applications: Reflow of fine pitch QFPs, removal and placement of chips.

PCT-1000 Programmable Pre-heater

The PCT-1000 is a fully Programmable Pre-heater offering **more heat capacity for soldering with lower temperatures for faster and higher quality results.**

The PCT-1000 provides users exceptional ability to increase heat capacity with highly controlled thermal output.

The PCT-1000 can be used as a stand alone unit or as part of the MRS-1100A Modular Rework System.

Key Features & Benefits

◗ Adds heat capacity and enables lower process temperatures
◗ Used in a variety of processes including soldering, desoldering, SMD rework
◗ Provides faster production rates while lowering overall process temperatures.
◗ 2 modes: manual for constant heater temperature and profile for greater process control
◗ 4 programmable heating zones and 1 cooling zone
◗ Storage for up to 50 user defined profiles for easy set-up
◗ Heater control with temperature controlled either at the heater output or at the board
◗ High efficiency vortex heater design maximizes ramp to temperature for increased productivity

Part No.		Description
PCT-1000	1	Programmable Preheater
Includes:		
PCT-FS1	2	PCT-1000 Foot Switch
AC-TCK-36-36	3	Thermocouple 36 AWG, pack of 2

Technical Specifications

Size	330 x 203 x 76mm (13" x 8" x 3")
Weight	3.4kg (7.5 lbs)
Rated Power	1200 W
Input Voltage	100-240 VAC, 50/60 Hz
Storage Temperature	0°C to 50°C (32°F to 122°F)
Air Flow	19 cfm (538 l/min)
SourceTemperature Range	25°C to 400°C (77°F to 752°F)
Operational Modes	Setup, Run, Manual, Active Setup
Display segments	LCD 20 x 4 display
Number of Programs	50 memory locations
Number of Zones	5 (4 Heat Zones, 1 Cool Down Zone)

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Adjustable Tool Holder & Board Holders

ATH-1100A Adjustable Tool Holder
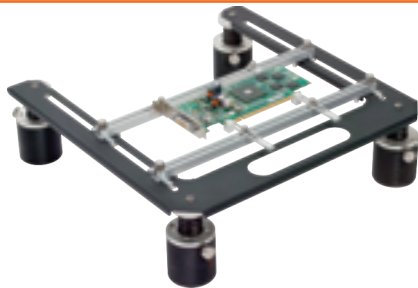

◗ Designed to work with the HCT-1000 or as part of the MRS-1100A System.

◗ Uses the Advanced Head Assembly which features 4" of Z axis adjustment, ½" fine adjustment of the X & Y axis as well as 30° θ adjustment.

◗ Features locking hand-piece retainer, Z axis stop and mounting configurations for stand-alone operation or integrated as part of the MRS-1100A.

◗ Sturdy and easy to attach to the PCT-1000 Programmable Preheater when incorporated into the MRS System.

◗ Can be attached to the PCT-1000 or used as a standalone unit

ATH-BASE Optional Base plate for ATH-1100A when used as a standalone unit.

Board Holders

BH-2000

The BH-2000 is a free-standing board holder that provides a solid and stable base for a variety of PCB's. The unit features easily adjustable rails to accommodate boards 8" (203mm) x open-ended.

Accommodate boards 12" (305mm) x 12" (305mm)

Accommodate boards 3.5" (89mm) x 7" (178mm)

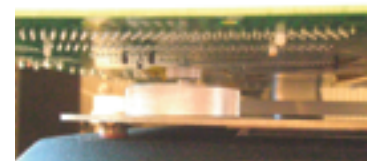**BH-100** Board Holder. Recommended for use with the PCT-100 Pre-heater

BH-010 Integrated Boardholder for PCT-100

Minimum PCB size is 0.60" (15mm)

BH-1000 Post-Rail Board Holder. Includes: 4 posts, 2 rails with sliding clips, 4 support pins and flat-head support

BH-PK1000 Board Holder Pin Kit. Includes: 2 discs,2 long pins, 2 short pins

PCT-100 Focused Convection Pre-heather

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Key Features & Benefits

◗ For hand soldering, through-hole desoldering, hot air SMT rework, lead-free, multi-layer boards and assemblies with large ground planes

◗ Improved process time and exceptional control of potentially damaging temperatures

◗ Vented top plate allows the PCB to be placed directly over the heater for maximum heat transfer

◗ Integrated or stand-alone board holder

◗ Optional adjustable-angle arm rest

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The PCT-100 is a focused convection pre-heater that is designed to **provide extra heat capacity** for demanding applications.

Unlike conventional pre-heaters, the PCT-100 Focused Convection Pre-heater directly targets the underside of the PCB providing a substantial thermal boost for lead-free processes.

Part No.		Description
PCT-100-11	1	Pre-heater 115V
PCT-100-21	1	Pre-heater 230V
PCT-101-11	2	Pre-heater 115V with Arm Rest
PCT-101-21	2	Pre-heater 230V with Arm Rest
PCT-102-11	3	Pre-heater 115V with Arm Rest and Boardholder
PCT-102-21	3	Pre-heater 230V with Arm Rest and Boardholder
PCT-103-11		Pre-heater 115V with Arm Rest and Integrated Boardholder
PCT-103-21		Pre-heater 230V with Arm Rest and Integrated Boardholder
PCT-1HE-11		Heating Element Replacement for PCT-100 115V
PCT-1HE-21		Heating Element Replacement for PCT-100 230V
BH-010		Integrated Boardholder for PCT-100 (see page 50)
BH-100	4	Boardholder for PCT-100
PCT-AR	5	Arm Rest for PCT-100
PCT-ARPAD		Replacement Pad for Arm Rest PCT-AR

Technical Specifications

Input Voltage	115 V (PCT-100-11)
	230 V (PCT-100-21)
Heater Rating	450 W
Storage Temperature	-10°C—60°C
	(14°F—140°F)
Environmental Temperature	0°C—40°C
	(32°F—104°F)
Air Flow	9.88 cfm (280 l/min)
Control Temperature	Variable up to 300°C
	(572°F)
Surface Resistivity ESD	$10^6\Omega$ - $10^{11}\Omega$
Dimensions (L x W x H)	205 x 155 x 65 mm
	(8" x 6.1" x 2.6")
Weight	1.6 kg (3.5 lbs)
Certificate/Approvals	cTUVus, CE

HCT-900 Hand Held Convection Tool

The HCT-900 Hand Held Convection Tool offers a **low cost, versatile rework solution** for a wide variety of production and rework application challenges:

◗ Rework a wide range of simple and complex SMT components

◗ Rework pin in-hole devices such as sockets and connectors

◗ Remove solder shorts and splashes by using it with solder braid and flux

◗ Plastic applications such as applying shrink wrap to components

Key Features & Benefits

◗ Versatile Hot Air Tool for soldering and desoldering applications
◗ Robust and compact design
◗ Analog controls for both airflow and heat
◗ Closed loop feedback circuit controls the temperature
◗ Unique low noise air pump (less than 45 db) provides precise airflow control
◗ Fully ESD compliant

A closed loop feedback circuit allows the desired temperature to be achieved and maintained regardless of changes in the volume of airflow.

Part No.	Description
HCT-900-11	115V Hand Held Convection Tool
HCT-HE-11	Heating Element, Replacement, 115V
HCT-900-21	230V Hand Held Convection Tool
HCT-HE-21	Heating Element, Replacement, 230V

The HCT-900 can be used for the removal and replacing of electronic components, including lead-free, from 0201 up to 304 pin QFP.

HCT-900 Hand Held Convection Tool

Nozzle Selection

The HCT-900 is supplied with a standard single jet H-D50 (0.2", 5.0mm) nozzle. In addition, two rework nozzle kits, predefined for specific applications, are available, as well as a full selection of nozzles.

NZKT-1	Nozzle Kit for Chip Resistors, SOIC & TSOP Packages. Includes (one each): • **H-D25** • **H-SL16** • **H-SL28** • **H-SOJ40** • **H-TS48**
NZKT-2	Nozzle Kit for PLCC, QFP & BQFP packages. Includes (one each): • **H-P20** • **H-P44** • **H-P84** • **H-Q1420** • **H-Q2626**

Model	Chip Type	A mm (in)	B mm (in)
H-P20	PLCC-20	11.9 (0.47")	11.9 (0.46")
H-P28	PLCC-28	14.5 (0.57")	14.5 (0.57")
H-P32	PLCC-32	16.9 (0.67")	14.3 (0.56")
H-P44	PLCC-44	19.5 (0.77")	19.5 (0.77")
H-P52	PLCC-52	21.0 (0.83")	21.0 (0.83")
H-P68	PLCC-68	27.1 (1.07")	27.1 (1.07")
H-P84	PLCC-84	32.4 (1.28")	32.4 (1.28")
H-Q07	QFP-48	8.4 (0.33")	8.4 (0.33")
H-Q10	QFP-44	13.4 (0.53")	13.4 (0.53")
H-Q14	QFP-52,80	17.3 (0.68")	17.3 (0.68")
H-Q1420	QFP-64,80,100	23.4 (0.92")	18.1 (0.71")
H-Q28	QFP-120,128,144,160	31.2 (1.23")	31.2 (1.23")
H-BQ23	BQFP-100	22.4 (0.88")	22.4 (0.88")
H-Q3232	QFP-240	34.5 (1.36")	34.5 (1.36")
H-BQ38	BQFP-196	37.7 (1.48")	37.7 (1.48")
H-Q2626	QFP-208	29.8 (1.17")	29.8 (1.17")

Model	Chip Type	A mm (in)	B mm (in)
H-S16	SOIC 14,16	6.8 (0.27")	10.2 (0.4")
H-SL16	SOL 14,16	10.6 (0.41")	10.8 (0.43")
H-SL20	SOL 20,20J	10.6 (0.41")	13.3 (0.52")
H-SL24	SOL 24,24J	10.6 (0.41")	15.9 (0.63")
H-SL28	SOL 28	10.6 (0.41")	18.4 (0.72")
H-SL44	SOL 44	16.0 (0.41")	27.9 (1.1")
H-SOJ32	SOJ 32	13.5 (0.53")	20.6 (0.81")
H-SOJ40	SOJ 40	13.5 (0.53")	25.4 (1.0")
H-TS24	TSOP 20-24	17.0 (0.67")	7.1 (0.28")
H-TS32	TSOP 28-32	21.0 (0.83")	9.1 (0.36")
H-TS40	TSOP 40	21.0 (0.83")	10.8 (0.43")
H-TS48	TSOP 48	21.0 (0.83")	13.3 (0.52")
H-TSW24	TSOP 20-24	10.2 (0.4")	18.4 (0.72")
H-TSW44	TSOP 24-28/40-44	12.7 (0.5")	19.8 (1.78")

Model	ø A
H-D25	2.5 mm (0.1")
H-D50	5.0 mm (0.2")
H-D120	12.0 mm (0.47")

Technical Specifications

Input Line Voltage	230 V HCT-900-21 / 115V HCT-900-11
Power	320 W
Air Pump Type	Diaphragm
Air Flow	6-25 l/min
Control Temperature	100ºC - 500ºC (212ºF - 932ºF)
Dimensions (L x W x H)	210 x 170 x 140 mm (8.7" x 6.7" x 5.5")
Noise Level	Less than 46 dBA
Surface Resistivity	Unit: $10^5\Omega$ - $10^6\Omega$. Hand-piece & tube: $10^7\Omega$ - $10^{11}\Omega$
Weight	4.7Kg (10.4 lbs)
Certification / Approvals	cTUVus, CE