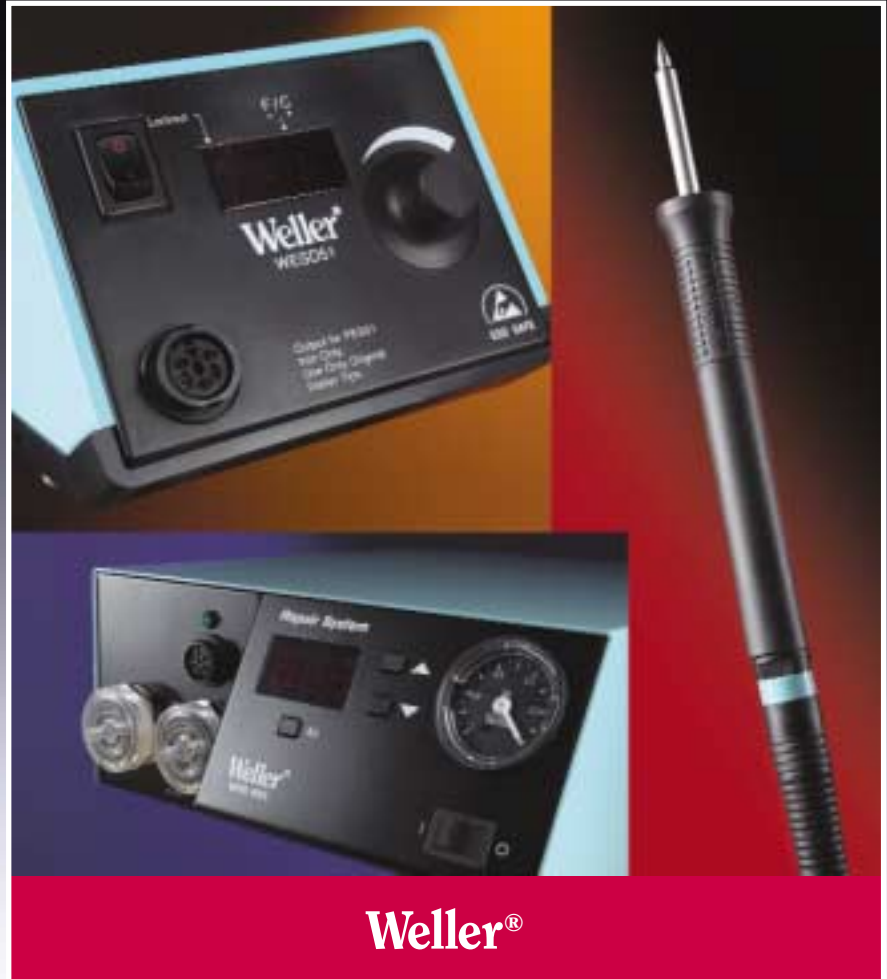


# CooperTools



**ELECTRONIC SOLDERING AND  
DESOLDERING TOOLS**

**COOPER** Tools

## Weller® Soldering Table of Contents

Founded in 1945, Weller® has become the world's leading supplier of professional quality soldering equipment, including the famous Weller® temperature controlled irons and soldering guns. Weller® also makes advanced soldering and desoldering stations, SMT equipment and irons for sophisticated industrial requirements, plus a series of handy soldering kits for home craftsmen, hobbyists and light industry.

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# WES51 Analog Soldering Station



**The Weller Advantage**

- Innovative heater and sensor combination gives you quick heat-up and rapid temperature recovery
- Wireless temperature lockout to prevent operators from raising the temperature to levels higher than specified for the board or component. Gives you control over the process
- Station automatically powers down after 90 minutes of inactivity to prolong tip life and save power



WES51 includes: WES51PU power unit, PES51 soldering pencil with ETA tip, and PH50 stand and sponge.

**Additional Product Features and Benefits:**

- IMPROVED plug on the PES51 iron and new receptacle on the WES51PU power unit for easier iron replacement
- Designed for continuous production soldering
- Slim, comfortable pencil reduces operator fatigue
- Tip temperature offset capability which provides the user with the capability of resetting station temperature readings to match in tip sizes and styles
- Iron is fitted with a non-burnable silicon rubber cord for safety
- UL and cUL listed
- ESD safe to protect sensitive components
- Use ET series tips found on page 5

Station	WES51	Pencil	PES51
Voltage	120V (input); 24V (output)	Power Consumption	50W
Temperature Range	350°F - 850°F (177°C - 454°C)	Heating Element Type	Nichrome Wound; Fiberglass and ceramic insulated
Footprint	5.9 X 4.5 X 3.6 IN (150 X 114 X 91 MM)	Iron Cord Length	4 ft. (1.22 m)
Weight	3.93 lb. (1.78 kg)	Supplied Tip	ETA
Temperature Accuracy	+/- 9°F (+/-5°C)	Iron Stand	PH50
Temperature Stability	+/-10°F (6°C)		
ESD Safe?	Yes		

**Applications:**

- Production, rework, and repair of through hole and SMT boards. Most ground planes and multi-layer boards.



The PES51 is perfect for production soldering, rework, or repair.



The new connector and plug on the WES51 is an improvement over the WES50

# WESD51 Digital Soldering Station



WESD51PU



PES51

PH50

WESD51 includes: WESD51PU power unit, PES51 soldering pencil with ETA tip, and PH50 stand and sponge.

## The Weller Advantage

- Innovative heater and sensor combination gives you quick heat-up and rapid temperature recovery
- Wireless temperature lockout to prevent operators from raising the temperature to levels higher than specified for the board or component. Gives you control over the process
- Station automatically powers down after 90 minutes of inactivity to prolong tip life and save power

### Additional Product Features and Benefits:

- Microprocessor controlled with digital LED display allows you to read temperature setting and actual tip temperature
- Designed for continuous production soldering
- Can switch between °F and °C
- Slim, comfortable pencil reduces operator fatigue
- Tip temperature offset capability which provides the user with the capability of resetting station temperature readings to match in tip sizes and styles
- Iron is fitted with a non-burnable silicon rubber cord for safety
- UL and cUL listed
- ESD safe to protect sensitive components
- Use ET series tips found on page 5

Station	WESD51	Pencil	PES51
Voltage	120V (input); 24V (output)	Power Consumption	50W
Temperature Range	350°F - 850°F (177°C - 454°C)	Heating Element Type	Nichrome Wound; Fiberglass and ceramic insulated
Footprint	5.9 X 4.5 X 3.6 IN (150 X 114 X 91 MM)	Iron Cord Length	4 ft. (1.22 m)
Weight	3.93 lb. (1.78 kg)	Supplied Tip	ETA
Temperature Accuracy	+/- 9°F (+/-5°C)	Iron Stand	PH50
Temperature Stability	+/-10°F (6°C)		
ESD Safe?	Yes		

### Applications:

- Production, rework, and repair of through hole and SMT boards. Most ground planes and multi-layer boards.



The PES51 can handle most general purpose hand soldering applications.

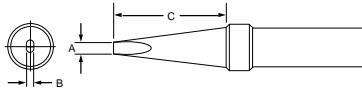


Wireless temperature lockout gives you control over the process.

# ET Series Tips for PES51 Soldering Pencil

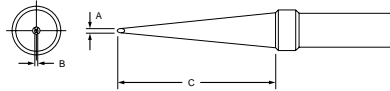
## The Weller Advantage

- The sensor hole in the base of the tip is fitted with a stainless steel liner to prevent the tip from seizing to the sensor



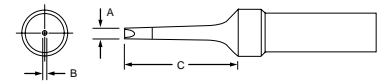
**Screwdriver**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ETA*	0.062	1.60	0.032	0.81	0.625	15.90
ETB*	0.093	2.40	0.020	0.51	0.625	15.90
ETC*	0.125	3.20	0.027	0.69	0.625	15.90
ETD	0.187	4.80	0.035	0.89	0.625	15.90
ETH	0.031	0.80	0.019	0.48	0.625	15.90



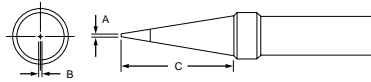
**Long Screwdriver**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ETJ	0.031	0.80	0.012	0.30	1.000	25.40
ETK*	0.046	1.20	0.026	0.66	1.000	25.40
ETL	0.078	2.00	0.027	0.69	1.000	25.40
ETM	0.125	3.20	0.037	0.94	1.000	25.40



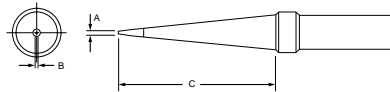
**Narrow Screwdriver**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ETR	0.062	1.60	0.044	1.12	0.625	15.90



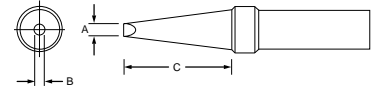
**Conical**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ETP*	0.031	0.80	0.012	0.30	0.625	15.90
ETT	0.024	0.60	0.036	0.91	0.625	15.90



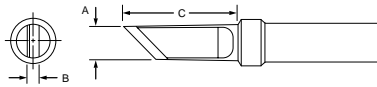
**Long Conical**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ETO*	0.031	0.80	0.044	1.12	1.000	25.40
ETS*	0.015	0.40	--	--	1.000	25.40



**Single Flat**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ETAA	0.062	1.60	0.040	1.02	0.625	15.90
ETBB	0.093	2.40	0.032	0.81	0.625	15.90
ETCC	0.125	3.20	0.032	0.81	0.625	15.90
ETDD	0.187	4.80	0.032	0.81	0.625	15.90
ETU	0.015	0.40	--	--	0.700	17.80
ETV	0.024	0.60	--	--	0.700	17.80



**Knife**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
ETKN	0.180	4.57	0.064	1.63	0.625	15.90

\* Indicates available bulk (100 multiples only)

# WSL/WSL2 Digital Soldering Station with WMP Micro Soldering Pencil



**WSL** includes: *WSLPU* power unit, *WMP* soldering pencil, and *WMPH* stand and sponge.

### The Weller Advantage

- The heating element is contained in the pencil rather than the tip so you don't throw away a good heater every time you wear out a tip. **Gives you substantial savings on tip costs compared to the competition**
- Micro soldering pencil with the shortest tip-to-grip distance (37mm) on the market today gives you excellent control and puts you closer to the work



**WSL2** includes: *WSL2PU* power unit, *WMP* soldering pencil, *WMPH* stand and sponge, *WSP80* soldering pencil *WHP81* stand and sponge.

### Additional Product Features and Benefits:

- Super-fast heat-up saves you time
- Superior thermal recovery allows fast, efficient soldering
- Tips are secured to the pencil by use of a threaded end, which eliminates the need for a barrel nut
- Iron is fitted with a non-burnable silicone rubber cord for safety
- The standard setback feature saves tip life and power. If the soldering pencil is not used for 20 minutes, the temperature is reduced to 300°F (150°C). After 60 minutes of inactivity, the unit is switched off
- The station's display is programmable using the optional WCB1 control module. Allows you to set temperature lock-out, set-back, and °F to °C switching
- Stations also support the WTA50 Thermal Tweezer, WHP80 Hot Plate, and WST20 Thermal Wire Stripper
- ESD safe to protect sensitive components
- UL and cUL listed
- Use new NT series tips found on page 7

Station	WSL and WSL2	Pencil	WMP	WSP80
Voltage	120V (input); 24V (output)	Power Consumption	65W	80W
Power Consumption	95W	Heating Element Type	Nichrome Wound	Silver Spool
Temperature Range	150°F - 850°F (66°C - 454°C)	Iron Cord Length	4 ft. (1.22 m)	4 ft. (1.22 m)
Footprint	6 1/2 X 4 1/2 X 4 IN (165 X 114 X 102 MM)	Supplied Tip	NT1	LTB
Weight	7.0 lb. (3.18 kg)	Iron Stand	WMPH	WPH81
Temperature Accuracy	+/- 9°F (+/-5°C)			
Temperature Stability	+/-10°F (6°C)			
ESD Safe?	Yes			

### Applications:

- Production, rework, and repair of through hole and SMT boards. Contact removal of IC's and QFP's using specialty SMT tips. Lead-free solder applications. Most ground planes and multi-layered boards.



The short (37mm) tip-to-grip distance puts you close to the work.

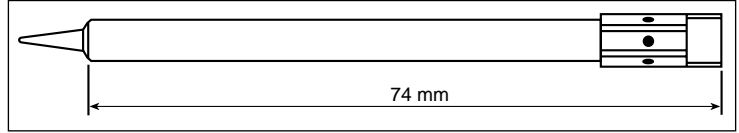


A SMT blade tip is ideal for soldering the leads of a QFP.



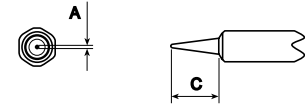
The heater is integrated into the handle. When the tip dies, the heater lives on.

# NT Series Tips for WMP Micro Soldering Pencil



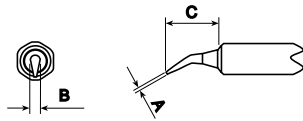
**The Weller Advantage**

- The heating element is contained in the pencil rather than the tip so you don't throw away a good heater every time you wear out a tip
- Gives you substantial savings on tip costs compared to the competition



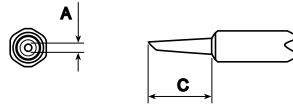
**Micro**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NT1	0.010	0.25	--	--	0.291	7.40
NT1S	0.010	0.25	--	--	0.333	8.45



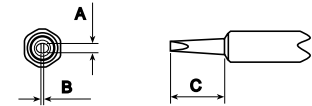
**Bent Round**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NT1X	0.016	0.40	0.063	1.60	0.321	8.15



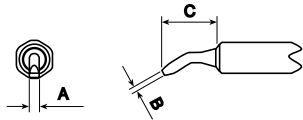
**Round**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NT4	0.047	1.20	--	--	0.390	9.90



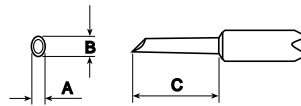
**Chisel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NT6	0.063	1.60	0.016	0.40	0.372	9.45
NTA	0.063	1.60	0.016	0.40	0.331	8.40
NTB	0.094	2.40	0.031	0.80	0.289	7.35
NTC	0.126	3.20	0.031	0.80	0.305	7.75
NTD	0.157	4.00	0.031	0.80	0.305	7.75
NTH	0.031	0.80	0.016	0.40	0.331	8.40
NTK	0.047	1.20	0.016	0.40	0.331	8.40



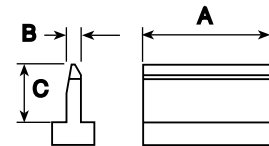
**Bent Chisel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NTAX	0.063	1.60	0.031	0.80	0.339	8.61



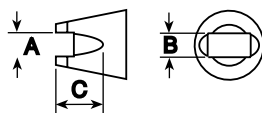
**Cylindrical**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NTGW	0.079	2.00	0.118	3.00	0.528	13.40



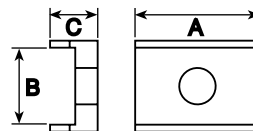
**SMT Blade**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NTSMT01	0.410	10.41	0.022	0.56	0.280	7.11
NTSMT02	0.620	16.75	0.022	0.56	0.280	7.11
NTSMT03	0.820	20.83	0.022	0.56	0.280	7.11



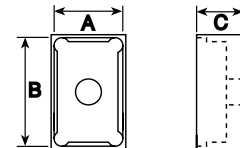
**SMT Slot**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NTSMT04	0.070	1.78	0.195	4.95	0.070	1.78
NTSMT05	0.060	1.52	0.090	2.29	0.070	1.78
NTSMT06	0.100	2.54	0.068	1.73	0.055	1.40
NTSMT07	0.090	2.29	0.190	4.53	0.070	1.78



**SMT Tunnel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NTSMT08	0.180	4.57	0.200	5.08	0.090	2.29
NTSMT09	0.410	10.41	0.200	5.08	0.090	2.29
NTSMT10	0.450	11.49	0.270	6.86	0.090	2.29
NTSMT11	0.520	13.21	0.375	9.53	0.125	3.18
NTSMT12	0.620	15.75	0.375	9.53	0.125	3.18
NTSMT13	0.720	18.27	0.375	9.53	0.125	3.18
NTSMT14	0.740	18.80	0.365	9.02	0.125	3.18



**SMT Quad**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
NTSMT15	0.105	2.67	0.303	7.70	0.150	3.81
NTSMT16	0.410	10.41	0.410	10.41	0.150	3.81
NTSMT17	0.500	12.70	0.500	12.70	0.150	3.81
NTSMT18	0.540	13.72	0.340	8.60	0.150	3.81
NTSMT19	0.750	19.05	0.750	19.05	2.350	5.96
NTSMT20	0.915	23.24	0.680	17.27	0.150	3.81
NTSMT21	0.965	24.51	0.965	24.51	2.350	5.96
NTSMT22	1.155	29.59	1.165	29.59	2.350	5.96

# WSD81/WSD161 Digital Silver Series Soldering Stations



**WSD81** includes: *WSD81PU* power unit, *WSP80* soldering pencil, and *WPH81* stand and sponge.

## The Weller Advantage

- You experience immediate heat from the combination of a unique silver heating element and tip configuration - allows faster, more efficient, soldering
- High output pencil allows you to work with lead-free solder while keeping tip costs low
- The WSD161 operates on two independently controlled channels. You can operate two 80-watt tools simultaneously



**WSD161** includes the power unit only. Soldering pencils and stands are sold separately.

### Additional Product Features and Benefits:

- IMPROVED - Software has been upgraded to allow the power unit to cycle faster, giving you improved response time
- IMPROVED - A standard setback feature has been added to save tip life and power. If the soldering pencil is not used for 20 minutes, the temperature is reduced to 300°F (150°C). After 60 minutes of inactivity, the unit is switched off
- 80-watts of controlled power allows you to work on high-mass components and boards
- Fast recovery and minimal temperature loss when making fast connections, makes this station perfect for continuous production soldering
- Programmable using the optional WCB1 control module - allows for temperature lock-out (process control), temperature set-back (extended tip life) and °F to °C conversion
- Irons fitted with a non-burnable silicone rubber cord for safety
- UL and cUL listed
- ESD safe to protect sensitive components
- Uses economical LT series tips (page 9), which are now tinned using LEAD-FREE SOLDER to comply with changing demands
- Stations also support the WTA50 Thermal Tweezer, WHP80 Hot Plate, and WST20 Thermal Wire Stripper

Station	WSD81	WSD161	Pencil	WSP80
Voltage	120V (input); 24V (output)	120V (input); 24V (output)	Power Consumption	80W
Power Consumption	95W	150W	Heating Element Type	Silver Spool
Temperature Range	150°F - 850°F (66°C - 454°C)	300°F - 850°F (150°C - 454°C)	Iron Cord Length	4 ft. (1.22 m)
Footprint	6 1/2 X 4 1/2 X 4 IN (165 X 114 X 102 CM)	6 1/2 X 4 1/2 X 4 IN (165 X 114 X 102 MM)	Supplied Tip	LTB
Weight	7.0 lb. (3.18 kg)	7.0 lb. (3.18 kg)	Iron Stand	WPH81
Temperature Accuracy	+/- 9°F (+/-5°C)	+/- 9°F (+/-5°C)		
Temperature Stability	+/-10°F (6°C)	+/-10°F (6°C)		
ESD Safe?	Yes	Yes		

### Applications:

- Production, rework, and repair of through hole and SMT boards. Contact removal of IC's and QFP's using specialty SMT tips. Lead-free solder applications. Heavy ground planes and multi-layered boards.



The WSP80 in use on a surface mount PCB.



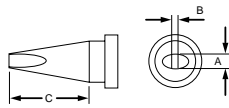
The WCB1 control module is used to set temperature lockout, set back, and °F to °C conversion.



A SMT quad tip is used to desolder a quad flat pack.

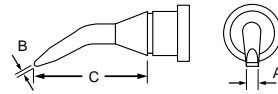


# LT Series Tips for WSP80 Soldering Pencil



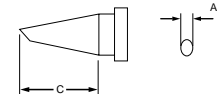
**Chisel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LTA	0.063	1.60	0.028	0.70	0.380	9.70
LTB	0.094	2.40	0.031	0.79	0.430	10.90
LTC	0.126	3.20	0.031	0.79	0.430	10.90
LTD	0.181	4.60	0.031	0.79	0.430	10.90
LTH	0.031	0.79	0.016	0.40	0.430	10.90
LTK	0.047	1.20	0.016	0.40	0.730	18.50
LTL	0.039	1.00	0.039	1.00	0.790	20.00
LTM	0.126	3.20	0.047	1.20	0.790	20.00



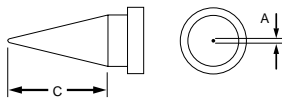
**Bent Chisel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LT4X	0.047	1.20	0.016	0.40	0.590	15.00
LTAX	0.063	1.60	0.032	0.80	0.500	12.70
LTHX	0.024	0.60	0.016	0.40	0.790	20.00



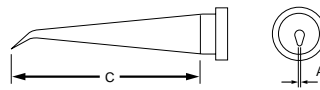
**Single Flat**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LT4W	0.047	1.20	--	--	0.590	15.00
LTF	0.047	1.20	--	--	0.490	12.50



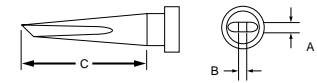
**Round**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LT1	0.010	0.25	--	--	0.430	10.90
LT1L	0.008	0.20	--	--	0.980	25.00
LT1S	0.016	0.40	--	--	0.790	20.00
LTAS	0.63	1.60	--	--	0.380	9.70
LTCS	0.126	3.20	--	--	0.430	10.90
LTS	0.016	0.40	--	--	0.790	20.00



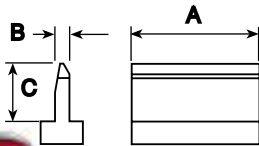
**Bent Round**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LT1LX	0.008	0.20	--	--	0.980	25.00
LT1SLX	0.012	0.30	--	--	0.760	19.20
LT1X	0.010	0.25	--	--	0.370	9.40



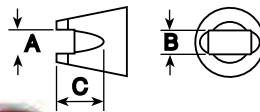
**Knife**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LTKN	0.059	1.50	0.033	0.80	0.730	18.50



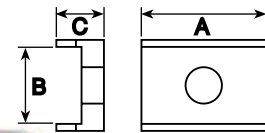
**SMT Blade**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LTSMT01	0.410	10.41	0.022	0.56	0.280	7.11
LTSMT02	0.620	16.75	0.022	0.56	0.280	7.11
LTSMT03	0.820	20.83	0.022	0.56	0.280	7.11



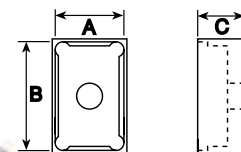
**SMT Slot**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LTSMT04	0.070	1.78	0.195	4.95	0.070	1.78
LTSMT05	0.060	1.52	0.090	2.29	0.070	1.78
LTSMT06	0.100	2.54	0.068	1.73	0.055	1.40
LTSMT07	0.090	2.29	0.190	4.53	0.070	1.78



**SMT Tunnel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LTSMT08	0.180	4.57	0.200	5.08	0.090	2.29
LTSMT09	0.410	10.41	0.200	5.08	0.090	2.29
LTSMT10	0.450	11.49	0.270	6.86	0.090	2.29
LTSMT11	0.520	13.21	0.375	9.53	0.125	3.18
LTSMT12	0.620	15.75	0.375	9.53	0.125	3.18
LTSMT13	0.720	18.27	0.375	9.53	0.125	3.18
LTSMT14	0.740	18.80	0.365	9.02	0.125	3.18



**SMT Quad**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
LTSMT15	0.105	2.67	0.303	7.70	0.150	3.81
LTSMT16	0.410	10.41	0.410	10.41	0.150	3.81
LTSMT17	0.500	12.70	0.500	12.70	0.150	3.81
LTSMT18	0.540	13.72	0.340	8.60	0.150	3.81
LTSMT19	0.750	19.05	0.750	19.05	2.350	5.96
LTSMT20	0.915	23.24	0.680	17.27	0.150	3.81
LTSMT21	0.965	24.51	0.965	24.51	2.350	5.96
LTSMT22	1.155	29.59	1.165	29.59	2.350	5.96

# MT1500 Microtouch™ Soldering Station



### The Weller Advantage

- An integrated heater and tip design gives you immediate heat for faster soldering. Heats up to set temperature in as little as 3 seconds
- The Touch Mode extends tip life and reduces operating costs by automatically powering down the pencil upon placing in the stand, and quickly adjusts to set temperature when the handle is touched again
- Unconditional five year warranty on the station and hand piece to ensure your complete satisfaction

MT1500 includes: MT1501 soldering pencil (no tip), and MT1502 stand, and leather tip-changing pad.

### Additional Product Features and Benefits:

- Quick tip change system requires no tools, saves you time and money
- Superior thermal recovery improves performance in all applications
- Three operating modes increases flexibility:
  - Continuous - tip stays at set temperature until turned off
  - Idle - station automatically sets back the temperature too 400°F (204°C) after 1 minute of inactivity
  - Touch Mode - station automatically powers the tool down upon release of handle and almost instantly adjusts to desired temperature when handle is touched again
- Iron is fitted with a non-burnable silicon rubber cord for safety
- UL and cUL listed
- ESD safe to protect sensitive components
- Use MT series tips found on page 11

Station	MT1500	Pencil	PES51
Voltage	120V (input); 24V/12V/6V (output) **	Iron Cord Length	4 ft. (1.22 m)
Power Consumption	150W	Supplied Tip	Tip Not Included
Temperature Range	400°F - 800°F (204°C - 454°C)	Iron Stand	MT1502
Footprint	6 5/8 X 4 1/8 X 3 7/8 IN (16.8 X 20.6 X 9.8 CM)		
Weight	8.2 lb. (3.72 kg)		
Temperature Accuracy	+/- 9°F (6°C)		
Temperature Stability	+/-10°F (6°C)		
ESD Safe?	Yes		

\*\* Tip Specific

### Applications:

- Production, rework, and repair of through hole and SMT boards. Lead-free solder applications. Heavy ground planes and multi-layer boards.



The MT1500 can handle the most demanding applications.

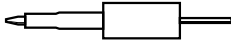


The MT1500 soldering pencil at work on a SMT component.

# MT Series Tips for MT1501 Soldering Pencil

**Tip Dimension Legend:**

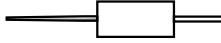
A = Tip Diameter  
 B = Tip Thickness  
 C = Tip Reach



**Screwdriver**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT211	0.045	1.14	0.015	0.38	1.00	25.40
MT212*	0.045	1.14	0.015	0.38	1.00	25.40
MT301	0.047	1.19	0.015	0.38	0.02	0.51
MT604	0.060	1.52	0.025	0.64	0.39	9.78
MT601	0.070	1.78	0.023	0.58	0.39	9.78
MT602	0.100	2.54	0.030	0.76	0.39	9.78
MT610	0.200	5.08	0.030	0.76	0.35	8.89

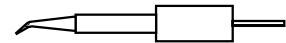
\* Non-wetting



**Conical**

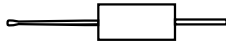
Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT302	0.015	0.38	--	--	0.02	0.51
MT303	0.015	0.38	--	--	0.32	8.13
MT606	0.016	0.41	--	--	0.53	13.46
MT613	0.020	0.51	--	--	0.52	13.21
MT609	0.023	0.58	--	--	0.60	15.24
MT202	0.030	0.76	--	--	1.00	25.40
MT203†	0.030	0.76	--	--	1.00	25.40
MT204*	0.030	0.76	--	--	1.00	25.40

\* Non-wetting  
 † Mil-Spec



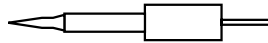
**Bent Conical**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT605	0.016	0.41	--	--	0.56	14.22
MT603	0.020	0.51	--	--	0.60	15.24



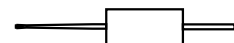
**Chisel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT611	0.060	1.52	0.010	0.25	0.61	15.49
MT614	0.100	2.54	0.015	0.38	0.19	4.38



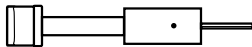
**Bevel**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT607	0.020	0.51	0.010	0.25	0.53	13.50
MT608	0.040	1.02	0.020	0.51	0.56	14.22



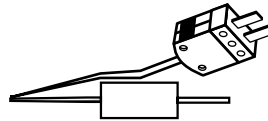
**Micro**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT221	0.031	0.79	--	--	1.00	25.40



**SMT Blade**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT617	0.410	10.41	0.022	0.56	0.28	7.11
MT1205	0.820	20.83	0.022	0.56	0.28	7.11



**Calibration**

Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
MT220	0.030	0.76	--	--	--	--
MT620	0.063	1.59	0.023	0.58	0.39	9.78

# WTCPT Temperature Controlled Soldering Station



**The Weller Advantage**

- Utilizes unique closed loop method of controlling maximum tip temperature - protects temperature sensitive components
- A ferromagnetic temperature sensor in the tip controls tip temperature - no adjustments are necessary. Provides process control

**WTCPT** includes: *PU120T* power unit, *TC201T* soldering pencil, and *PH1201ESD* stand and sponge.

**Applications:**

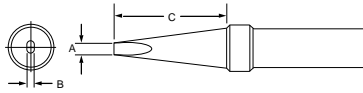
- Production, rework, and repair of through hole and SMT boards. Some ground planes and multi-layer boards. Repetitive soldering at a consistent temperature.

**Additional Product Features and Benefits:**

- A lighted rocker switch indicates on/off status
- Quick disconnect plug for soldering iron allows fast iron change
- PT series tips are available in three standard temperature ranges: 600°F, 700°F, 800°F. See page 13
- Power unit features impact resistant plastic for durability
- ESD safe to protect sensitive components
- UL and cUL listed

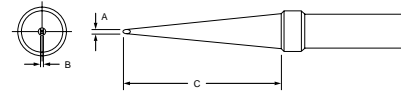
Station	WTCPT	Pencil	TC201T
Voltage	120V (input); 24V (output)	Power Consumption	42W
Power Consumption	60W	Heating Element Type	Nichrome Wound, Plug-in
Temperature Range	600°F - 800°F (316°C - 427°C)	Iron Cord Length	4 ft. (1.22 m)
Footprint	4 1/2 X 5 15/16 X 3 5/8 IN (114 X 150 X 91MM)	Supplied Tip	PTA7
Weight	3.9 lb. (1.78 kg)	Iron Stand	PH1201ESD
ESD Safe?	Yes		

# PT Series Tips for TC201T Soldering Pencil



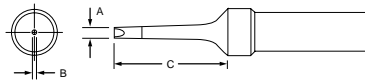
**Screwdriver**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
PTH6	PTH7	PTH8	0.031	0.79	0.019	0.48	0.62	15.87
PTA6	PTA7*	PTA8*	0.062	1.57	0.032	0.81	0.62	15.87
PTB6	PTB7*	PTB8*	0.093	2.38	0.020	0.51	0.62	15.87
PTC6	PTC7*	PTC8*	0.125	3.17	0.027	0.69	0.62	15.87
PTD6	PTD7	PTD8*	0.187	4.74	0.035	0.89	0.62	15.87
--	PTE7	PTE8	0.234	5.95	0.042	1.07	0.62	15.87



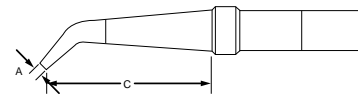
**Long Screwdriver**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
--	PTJ7	PTJ8	0.031	0.79	0.012	0.30	1.00	25.40
PTKX6	--	--	0.046	1.17	0.030	0.76	1.00	25.40
PTK6	PTK7*	PTK8	0.046	1.19	0.026	0.66	1.00	25.40
--	PTL7	PTL8	0.078	1.98	0.027	0.69	1.00	25.40
--	PTM7	PTM8	0.125	3.17	0.037	0.94	1.00	25.40



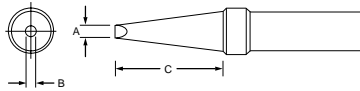
**Narrow Screwdriver**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
PTR6	PTR7	PTR8	0.062	1.58	0.044	1.12	0.62	15.87



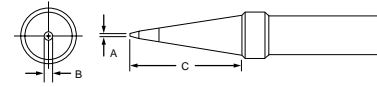
**Slotted Bent**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
--	PTZ7	--	0.020	0.50	--	--	1.00	25.40



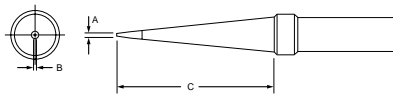
**Single Flat**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
--	PTAA7	PTAA8	0.062	1.57	0.040	1.42	0.62	15.87
--	PTBB7	PTBB8	0.093	2.38	0.032	0.81	0.62	15.87
--	PTCC7	PTCC8	0.125	3.17	0.032	0.81	0.62	15.87
--	PTDD7	PTDD8	0.187	4.74	0.032	0.81	0.62	15.87



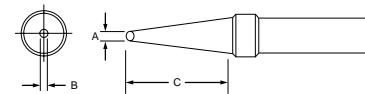
**Conical**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
--	--	PTT8	0.025	0.63	0.036	0.91	0.62	15.87
PTP6	PTP7*	PTP8*	0.031	0.79	0.012	0.30	0.62	15.87



**Long Conical**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
PTS6	PTS7	PTS8	0.015	0.39	--	--	1.00	25.40
PTO6	PTO7*	PTO8*	0.031	0.79	0.044	1.12	1.00	25.40



**Conical Flat**

Cat. No.	Cat. No.	Cat. No.	A		B		C	
			in.	mm	in.	mm	in.	mm
600°	700°	800°						
--	PTF7	PTF8	0.047	1.19	0.033	0.84	0.62	15.87

\* Indicates available bulk (100 multiples only)

# WDD81V(IL) Digital Shop Air Desoldering Stations



**WDD81VIL** includes: power unit, *DSV80* in-line desoldering pencil, and *AKV* stand.

**DS80** desoldering pencil is available with the *WDD81V* desoldering station and comes with the *AK20* stand.

### The Weller Advantage

- 80 watts of power for faster heat up and better performance even on heavy ground planes and multi-layer boards
- Higher power means less time spent on the PCB and less potential for damaging components
- Vacuum delay feature on the desoldering tool allows the solder to reach the solder collection chamber before the vacuum is shut off to avoid clogging

**Additional Product Features and Benefits:**

- High performance desoldering tool for safety and efficiently removing through hole components from PCB's
- Features digital process control for exact temperature set - gives you control over the process
- Microprocessor circuitry automatically recognizes other Weller soldering accessories and provides the optimal setting for that tool
- Uses fast-response shop air
- WDD81VIL comes with DSV80 in-line desoldering tool with internal solder collection chamber - ideal for vertical desoldering
- WDD81V comes with DS80 desoldering pencil with external solder collection chamber - ideal for horizontal desoldering
- ESD safe to protect sensitive components
- Programmable using the optional WCB1 control module - allows for temperature lock-out (process control), temperature set-back (extended tip life) and °F to °C conversion
- Uses DS series desoldering tiplests found on page 16

Station	WDD81V and WDD81VIL	Pencil	DS80	DSV80
Voltage	120V (input); 24V (output)	Power Consumption	80W	80W
Power Consumption	95W	Heating Element Type	Nichrome Wound	Nichrome Wound
Temperature Range	122°F - 842°F (50°C - 450°C)	Iron Cord Length	4 ft. (1.22 m)	4 ft. (1.22 m)
Footprint	7.1 X 4.53 X 4 IN (180 X 115 X 101 MM)	Supplied Tiplest	DS112	DS112
Weight	4.75 lb. (2.16 kg)	Iron Stand	AK20	AKV
Pump Type	Compressed Air Converter			
Vacuum Pressure	21 in. HG (0.8 Bar)			
Temperature Stability	+/-10°F (6°C)			
ESD Safe?	Yes			

**Applications:**

- Rework and repair of through hole boards. Lead-free solder applications.



The WDD81V is shown here with the DS80 desoldering pencil.

# WRS1001(2) Digital Self-contained Desoldering Stations



**WRS10011** contains: *WRS1001* control unit, *DSV80* inline desoldering pencil with internal solder collection chamber, and *AKV* stand.

**WRS10012** contains: *WRS1001* control unit, *DS80* desoldering pencil with external solder collection chamber, and *AK20* stand.

**Additional Product Features and Benefits:**

- Vacuum is generated with a self-contained pump. The pump also generates air should you want to use the optional HAP1 hot air pencil
- Features digital process control for exact temperature set - gives you control over the process
- WRS10011 comes with DSV80 in-line desoldering tool with internal collection chamber - ideal for vertical desoldering
- WRS10012 comes with DS80 desoldering pencil with external solder collection chamber - ideal for horizontal desoldering
- Station also supports Silver Series soldering pencils WSP80 and WMP Micro Pencil for added flexibility
- Programable using the optional WCB1 control module - allows for temperature lock-out (process control), temperature set-back (extended tip life) and °F to °C conversion
- Uses DS series desoldering tiptlets found on page 16
- ESD safe to protect sensitive components

### The Weller Advantage

- 80 watts of power for faster heat up and better performance even on heavy ground planes and multi-layer boards
- Higher power means less time spent on the PCB and less potential for damaging components
- Vacuum delay feature on the desoldering tool allows the solder to reach the solder collection chamber before the vacuum is shut off to avoid clogging

Station	WRS10011 and WRS10012	Pencil	DS80	DSV80
Voltage	120V (input); 24V (output)	Power Consumption	80W	80W
Power Consumption	175W	Heating Element Type	Nichrome Wound	Nichrome Wound
Temperature Range	150°F - 980°F (66°C - 511°C)	Iron Cord Length	4 ft. (1.22 m)	4 ft. (1.22 m)
Footprint	9.5 X 10.6 X 4.1 IN (241 X 269 X 104 MM)	Supplied Tiptlet	DS112	DS112
Weight (Power Unit Only)	12.9 lb. (5.85 kg)	Iron Stand	AK20	AKV
Pump Type	Rotary Vane			
Air Flow Volume	1 l/min. - 10 l/min.			
Temperature Accuracy	+/-50°F (30°C)			
Temperature Stability	+/-10°F (6°C)			
ESD Safe?	Yes			

**Applications:**

- Rework and repair of through hole boards. Lead-free solder applications.



DSV80 in-line desoldering tool with internal solder collection chamber



DS80 desoldering pencil with external solder collection chamber

# WRS3000V1(2) Self-contained Solder/Desoldering Stations



**WRS3000V1** comes with *WRS3000* power unit, *DSV80* in-line desoldering pencil, *AKV* stand and sponge, *WSP80* soldering pencil, *WPH80* stand and sponge.



**DS80** desoldering pencil is available with the *WRS3000V2* desoldering station and comes with the *AK20* stand.

### The Weller Advantage

- 80 watts of power for faster heat up and better performance even on heavy ground planes and multi-layer boards
- Higher power means less time spent on the PCB and less potential for damaging components
- Vacuum delay feature on the desoldering tool allows the solder to reach the solder collection chamber before the vacuum is shut off to avoid clogging
- 300 watts of total power over three independently controlled channels (100 watts per channel) plus air and vacuum ports allows you to use up to three 80/100-watt tools simultaneously

**Applications:**

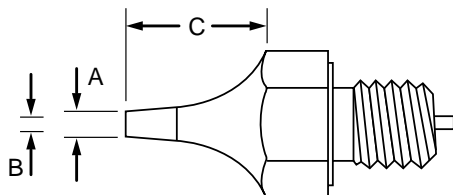
- Rework and repair of mixed technology boards. Lead-free solder applications. Contact removal of IC's and QFP's using specialty SMT tips with the WSP80. Heavy ground planes and multi-layer boards.

**Additional Product Features and Benefits:**

- Built-in pump provides both vacuum for the desoldering tool and air for the optional HAP1 hot air tool
- Microprocessor with digital read-out gives you complete accuracy and reliability
- Temperature set-back can be programmed with the built-in timer from 5 to 60 minutes in 5 minute intervals
- Vacuum for desoldering is activated by a finger switch on the tool
- Lock-out key to maintain process control for set parameters
- Full range of desoldering tiptlets found on page 16
- ESD safe to protect sensitive components

Station	WRS3000V1 (2)	Pencil	WSP80	DSV80	DS80
Voltage	120V (input); 24V (output)	Power Consumption	80W	80W	80W
Power Consumption	300W	Heating Element Type	Silver Spool	Nichrome Wound	Nichrome Wound
Temperature Range	150°F - 850°F (66°C - 454°C)	Iron Cord Length	4 ft. (1.22 m)	4 ft. (1.22 m)	4 ft. (1.22 m)
Footprint	9.5 X 10.6 X 4.1 IN (241 X 269 X 104 MM)	ESD Safe?	Yes	Yes	Yes
Weight (Power Unit Only)	22 lb. (10 kg)	Standard Tip	LTB	DS112	DS112
Pump Type	Rotary Vane	Iron Stand	WPH80	AKV	AK20
Vacuum Pressure	20.7" (526mm) HG	Optional Stand	WPH81		
Air Flow Volume	1 l/min. - 10 l/min.	For SMT Tips			
Temperature Accuracy	+/-16°F (10°C)				
Temperature Stability	+/-10°F (6°C)				
ESD Safe?	Yes				

## DS Series Tiptlets for DS80 and DSV80



Cat. No.	A		B		C	
	in.	mm	in.	mm	in.	mm
DS110	0.062	1.52	0.024	0.63	0.50	12.70
DS111	0.093	2.48	0.024	0.63	0.50	12.70
DS112	0.078	1.93	0.031	0.91	0.50	12.70
DS113	0.093	2.48	0.046	1.16	0.50	12.70
DS114	0.125	3.25	0.073	1.80	0.50	12.70
DS116	0.093	2.48	0.043	1.14	0.75	19.05
DS117	0.093	2.48	0.024	0.63	0.75	19.05



# WRS3000(S)(ST) Rework and Repair Systems



WTA50 thermal tweezers and AK51 stand is available with WRS3000ST four function rework station.



WRS3000S includes: WRS3000 control unit, DSV80 in-line desoldering pencil, AKV stand and sponge, WSP80 soldering pencil, WPH80 stand and sponge, HAP1 hot air pencil, PH60 stand and sponge.

**Additional Product Features and Benefits:**

- Built-in pump provides both air for the hot air tool and vacuum for the desoldering tool
- Microprocessor with digital read-out gives you complete accuracy and reliability
- Temperature set-back can be programmed with the built-in timer from 5 to 60 minutes in 5 minute intervals
- Air flow for the hot air tool and vacuum for desoldering are activated by a finger switch on the tools
- Lock-out key to maintain process control for set parameters
- Full range of soldering tips (page 9), desoldering tiptlets (page 16), hot air nozzles (page 21), and thermal tweezers tips (page 21) are available
- Special ionizing circuit assures that hot air is static free to protect sensitive components

**The Weller Advantage**

- 300 watts of total power over three independently controlled channels (100 watts per channel) plus air and vacuum ports allows you to use up to three 100-watt tools simultaneously
- Vacuum delay feature on the desoldering tool allows the solder to reach the solder collection chamber before the vacuum is shut off to avoid clogging

**Applications:**

- Production, rework, and repair of through hole and surface mount boards. Contact removal of IC's and QFP's using specialty SMT tips. Applications requiring non-contact hot air. Heavy ground planes and multi-layer boards. Lead-free solder applications



Non-contact soldering with the HAP1 hot air pencil.



Desoldering a SMT component using the WTA50 thermal tweezers.



The DSV80 80-watt desoldering tool is perfect for desoldering through-hole components.

# WRS4000 Four-function Rework and Repair System



**WRS4000** includes: *WRS3000* control unit, *WRS1001* control unit, *WSP80* soldering pencil, *WPH80* stand and sponge, *DSV80* in-line desoldering pencil, *AKV* stand and sponge, *WTA50* thermal tweezers, *AK51* stand and sponge, *HAP1* hot air pencil, *PH60* stand and sponge.

## The Weller Advantage

- 400 watts of total power over four independently controlled channels (100 watts per channel) plus air and vacuum ports allows you to use up to four 100-watt tools simultaneously: soldering, desoldering, hot air, and thermal tweezers
- Vacuum delay feature on the desoldering tool allows the solder to reach the solder collection chamber before the vacuum is shut off to avoid clogging

### Applications:

- Production, rework, and repair of through hole and SMT boards. Contact removal of IC's and QFP's using specialty SMT tips. Applications requiring non-contact hot air. Heavy ground planes and multi-layer boards. Lead-free solder applications.

### Additional Product Features and Benefits:

- Built-in pump provides both air for the hot air tool and vacuum for the desoldering tool
- Microprocessor with digital read-out gives you complete accuracy and reliability
- Temperature set-back can be programmed with the built-in timer from 5 to 60 minutes in 5 minute intervals
- Air flow for the hot air tool and vacuum for desoldering are activated by a finger switch on the tools
- Lock-out key to maintain process control for set parameters
- Full range of soldering tips (page 9), desoldering tiptlets (page 16), hot air nozzles (page 21), and thermal tweezers tips (page 21) are available
- Special ionizing circuit assures that hot air is static free to protect sensitive components

# WRS5000 Five-function Rework and Repair System

## The Weller Advantage

- 400 watts of total power over four independently controlled channels (100 watts per channel) plus air and vacuum ports allows you to use up to six tools simultaneously: soldering, desoldering, hot air, and thermal tweezers, dispensing, and vacuum pickup
- Vacuum delay feature on the desoldering tool allows the solder to reach the solder collection chamber before the vacuum is shut off to avoid clogging



**WRS5000** includes: *WRS3000* and *WRS2000* control units, *WSP80* soldering pencil, *WPH80* stand and sponge, *DSV80* in-line desoldering pencil, *AKV* stand and sponge, *HAP1* hot air pencil, *PH60* stand and sponge, *WTA50* thermal tweezers, *AK51* stand and sponge, vacuum pencil, syringe and needle, vacuum pencil and syringe stand

### Additional Product Features and Benefits:

- Built-in pump provides both air for the hot air tool and vacuum for the desoldering tool
- Microprocessor with digital read-out gives you complete accuracy and reliability
- Temperature set-back can be programmed with the built-in timer from 5 to 60 minutes in 5 minute intervals
- Air flow for the hot air tool and vacuum for desoldering are activated by a finger switch on the tools
- Includes a vacuum pickup wand for handling components
- Dispensing and vacuum pickup wand utilize fast-acting shop air
- Timer on the front panel allows dispensing in timed intervals
- Lock-out key to maintain process control for set parameters
- Full range of soldering tips (page 9), desoldering tiplests (page 16), hot air nozzles (page 21), and thermal tweezers tips (page 21) are available
- Special ionizing circuit assures that hot air is static free to protect sensitive components

### Applications:

- Production, rework, and repair of through hole and SMT boards. Applications requiring non-contact hot air. Heavy ground planes and multi-layer boards. Solder paste, epoxy, silicone, and potting compound dispensing applications. Lead-free solder applications.



The WSP80 in use on a surface mount PCB.



Non-contact soldering with the HAP1 hot air pencil.



The WTA50 is perfect for removing Mel's from a SMT board.

# WRS7000 Seven-function Rework and Repair System



### The Weller Advantage

- Over 1200 watts of total power over five independently controlled channels (100 watts per channel) plus air and vacuum ports allows you to use up to seven tools simultaneously: soldering, desoldering, small hot air pencil (100W), large hot air pencil (700W), thermal tweezers, dispensing, and vacuum pickup
- Vacuum delay feature on the desoldering tool allows the solder to reach the solder collection chamber before the vacuum is shut off to avoid clogging

**WRS7000** includes: *WRS3000* and *WRS2000* and *WHA2000* control units, *WSP80* soldering pencil, *WPH80* stand and sponge, *DSV80* in-line desoldering pencil, *AKV* stand and sponge, *HAP1* hot air pencil, *PH60* stand and sponge, *WTA50* thermal tweezers, *AK51* stand and sponge, vacuum pencil, syringe and needle, vacuum pencil and syringe stand.

### Additional Product Features and Benefits:

- Built-in pump provides both air for the hot air tool and vacuum for the desoldering tool
- Microprocessor with digital read-out gives you complete accuracy and reliability
- Temperature set-back can be programmed with the built-in timer from 5 to 60 minutes in 5 minute intervals
- Air flow for the hot air tool and vacuum for desoldering are activated by a finger switch on the tools
- Self-contained hot air station with large hot air pencil. Allows you to easily rework and repair large IC's and QFP's
- Large hot air pencil has built-in vacuum pickup - eliminates guesswork when chip is ready for removal
- Includes a vacuum pickup wand for handling components
- Dispensing and vacuum pickup wand utilize fast-acting shop air
- Timer on the front panel allows dispensing in timed intervals
- Lock-out key to maintain process control for set parameters
- Full range of soldering tips (page 9), desoldering tiplests (page 16), hot air nozzles (page 21), and thermal tweezers tips (page 21) are available
- Special ionizing circuit assures that hot air is static free to protect sensitive components

### Applications:

- Production, rework, and repair of through hole and SMT boards. Applications requiring non-contact hot air. Heavy ground planes and multi-layer boards. Solder paste, epoxy, silicone, and potting compound dispensing applications. Lead-free solder applications



A SMT quad tip is used to desolder a quad flat pack with the WSP80 soldering pencil.

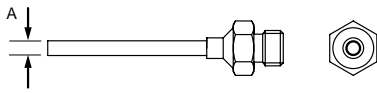


Hot air is directed onto the leads of the QFP component.



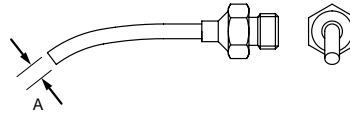
Through hole rework with the DSV80

# Nozzles for HAP1 Small Hot Air Pencil



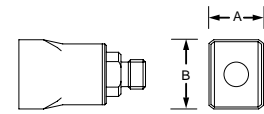
**Round**

Cat. No.	A		B	
	in.	mm	in.	mm
0058727823	0.031	0.80	--	--
0058727821	0.047	1.20	--	--
0058727787	0.098	2.50	--	--
0058727822	0.118	3.00	--	--



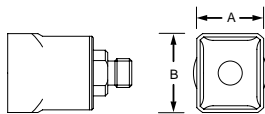
**Round Bent**

Cat. No.	A		B	
	in.	mm	in.	mm
0058727786	0.079	2.00	--	--



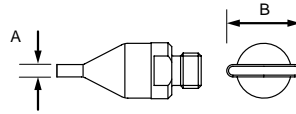
**2-Sides Heated**

Cat. No.	A		B	
	in.	mm	in.	mm
0058727782	0.394	10.00	0.512	13.00
0058727781	0.394	10.00	0.591	15.00
0058727784	0.394	10.00	0.709	18.00
0058727779	0.413	10.50	0.413	10.50



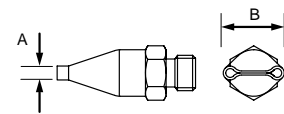
**4-Sides Heated**

Cat. No.	A		B	
	in.	mm	in.	mm
0058727777	0.236	6.00	0.256	6.50
0058727778	0.236	6.00	0.354	9.00
0058727780	0.394	10.00	0.591	15.00
0058727783	0.492	12.50	0.591	15.00
0058727785	0.709	18.00	0.709	18.00



**Flat**

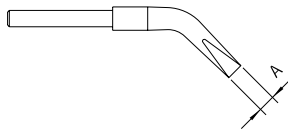
Cat. No.	A		B	
	in.	mm	in.	mm
0058727774	0.059	1.50	0.315	8.00
0058727784	0.059	1.50	0.394	10.00
0058727779	0.059	1.50	0.472	12.00



**Dual**

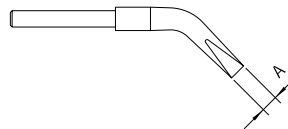
Cat. No.	A		B	
	in.	mm	in.	mm
0058727775	0.059	1.50	0.315	8.00
0058727776	0.059	1.50	0.394	10.00

# WT Series Tips for WTA50 Thermal Tweezers



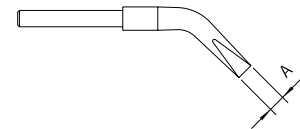
**WTA1**

Cat. No.	A	
	in.	mm
0054414199	0.039	1.00



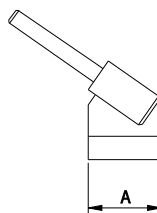
**WTA2**

Cat. No.	A	
	in.	mm
0054414699	0.118	3.00



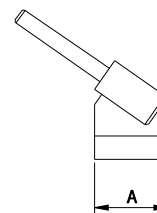
**WTA3**

Cat. No.	A	
	in.	mm
0054414799	0.236	6.00



**WTA4**

Cat. No.	A	
	in.	mm
0054414399	0.492	12.50



**WTA5**

Cat. No.	A	
	in.	mm
0054414499	0.728	18.50

# WQB3000 BGA/QFP Rework Station



WQB3000

**Additional Product Features and Benefits:**

**Base Unit:**

- The unit features a two head system for component placement and hot air desoldering
- The two heads operate on sliding arms, which are controlled by pneumatic cylinders
- The control electronics and pneumatic unit are integrated into the rear housing
- LED's on the back of the housing panel indicate four process states: top heater, bottom heater, desoldering, and cooling
- RS-232 interface for data input unit or PC control. An easy-to-use PC software interface for input using a computer, rather than the supplied control box, is included

**Soldering and Placement Heads:**

- The connection for the hot air nozzle temperature sensor is in the soldering head to give you the highest possible hot air temperature accuracy
- Precision linear feed for vertical adjustment, approximately 3.2" (80 mm) stroke
- A continuously adjustable depth stop prevents the head from dropping onto the board
- The head mechanisms are pneumatically damped to give you finer control over the movement of the soldering and placement heads

**Soldering Head Only:**

- A vacuum lift built into the hot air nozzle allows for the automatic desoldering of components. The vacuum tube can be continuously adjusted in height with a 10 mm adjustment range
- Theta rotation of the soldering head in a range of -5° to 95°
- A swiveling halogen light is mounted near the soldering and placement heads in order to illuminate the work space
- A wide range of easily interchangeable hot air nozzles are available and are listed on page 23

**Applications:**

- Rework and repair of SMT array packages including ceramic, and plastic, BGA's, micro BGA's, Chip Scale Packages, PLCC's, and QFP's. Multi-layer boards and ground planes.



The WQB3000 is ready to desolder a BGA component.



Parameters for each process can be programmed into the data input unit.



BGA placement is easy using the patented Weller® placement templates.

## The Weller Advantage

- Excellent process control including below-board infrared pre-heating, precisely regulated and metered heat applied to the component, and electronic digital regulation of the air flow rate
- All process steps can be programmed and saved as rework profiles on the digital data input unit or a PC
- The WQB3000 utilizes the patented Weller mini-template system for the placement of components on the circuit board

**Placement Head Only:**

- A vacuum receptacle is activated by a button on the front of the placement head
  - A reducer insert for the vacuum receptacle is provided for smaller components
- Bottom Heater:**
- Table is equipped with a high temperature long wavelength infrared ceramic lamp for efficient bottom pre-heat of the PCB
  - The bottom pre-heater is divided into two zones: The 400-watt inner zone is 5" x 5". The 1600-watt outer zone is 10.6" x 10.6"
  - The temperature is regulated by thermocouples integrated in the central heater lamp

**Circuit Board Holder:**

- Able to hold circuit boards with a minimum width of 1.2" (30 mm) and a maximum width of 19.5" (495 mm) and unlimited length
- After positioning the board, a precision drive in the X and Y directions allows you to achieve exact positioning. The adjustment range is ± 0.40" (10 mm) with adjustment precision of ± 0.002" (0.05 mm). The controls for the precision adjustment are located on the sides of the table

**Data Input Unit:**

- Parameters for each process step, including bottom heater temperature, soldering head temperature, airflow rate, process time, and cooling time can be programmed
- A LCD display with background lighting gives you a clear, easy-to-read display
- A key switch is provided to lockout against unauthorized use
- Up to 30 profiles can be stores in the data input unit

Station	WQB3000
Dimensions (L x W x H)	25.6 x 23.6 x 19.7 IN (650 x 600 x 500 mm)
Input Voltage	230 - 240V, 50-60 Hz
Power Consumption-Soldering Head	700W
Power Consumption-Bottom Heater	400W (Inner) & 1600W (Outer)
Temperature Range-Soldering Head	122°F - 752°F (50°C - 400°C)
Temperature Accuracy	+/-59°F (15°C)
Air Flow Rate	5 - 50 l/Min.
Total Weight	80 lb. (36 kg)

## Nozzles and Templates for WQB3000

Component	Matrix	Component Body Size	Pitch (mm)	Nozzle No.	Nozzle I.D. (mm)	Nozzle O.D. (mm)	Template No.
Micro BGA	23 X 23	12 X 12	0.50S	0058747904	13.5 X 13.5	14.3 X 14.3	0058754945
Micro BGA	29 X 29	15 X 15	0.50	0058747935	15.5 X 15.5	16.5 X 16.5	0058747932
Micro BGA	6 X 10	8 X 10.2	0.75	0058747961	8.5 X 10.6	9.5 X 11.6	0058747963
Micro BGA	8 X 8	8.1 X 8.1	0.75	0058747945Δ	8.5 X 8.5	9.5 X 9.5	0058754838Δ
Micro BGA	9 X 8	7.6 X 16.4	0.75	0058747833	18 X 18	20 X 20	0058747899
Micro BGA	10 X 10	10 X 10	0.80	0058747848	12 X 12	13 X 13	0058747958
Micro BGA	13 X 13	12 X 12	0.80	0058747904	13.5 X 13.5	14.3 X 14.3	0058747959Δ
Micro BGA	14 X 14	13 X 13	0.80	0058747904	13.5 X 13.5	14.3 X 14.3	0058747934Δ
Micro BGA	15 X 15	13 X 13	0.80	0058747904	13.5 X 13.5	14.3 X 14.3	0058747973Δ
Micro BGA	18 X 18	16 X 16	0.80	0058747833	18 X 18	20 X 20	0058747964
Micro BGA	19 X 19	16 X 16	0.80	0058747833	18 X 18	20 X 20	0058754841
Micro BGA	6 X 8	8 X 10.2	0.80	0058747961	8.5 X 10.6	9.5 X 11.6	0058754763
Micro BGA	7 X 7	7 X 7	0.80	0058747945Δ	8.5 X 8.5	9.5 X 9.5	005874762Δ
Micro BGA	8 X 8	8 X 8	0.80	0058747945Δ	8.5 X 8.5	9.5 X 9.5	0058747956Δ
Micro BGA	9 X 9	8 X 8	0.80	0058747945Δ	8.5 X 8.5	9.5 X 9.5	0058747954Δ
BGA 209	11 X 19	14 X 22	1.00	0058747977	15.5 X 23.5	16.5 X 24.5	0058754847
BGA	12 X 12	13 X 13	1.00	0058747904	13.5 X 13.5	14.3 X 14.3	0058747929
BGA 196	14 X 14	15 X 15	1.00	0058747935	15.5 X 15.5	16.5 X 16.5	0058747930
BGA	16 X 16	17 X 17	1.00	0058747833	18 X 18	20 X 20	0058747931
BGA 484	22 X 22	23 X 23	1.00	0058747764	25 X 25	27 X 27	0058754760
BGA	24 X 24	25 X 25	1.00	0058747850Δ	27 X 27	29 X 29	0058754779Δ
BGA 676	26 X 26	27 X 27	1.00	0058747927	29 X 29	31 X 31	0058754777
BGA	29 X 29	31 X 31	1.00	0058747906	33 X 33	35 X 35	0058754761
BGA 900	30 X 30	31 X 31	1.00	0058747906	33 X 33	35 X 35	0058754849
BGA	34 X 34	35 X 35	1.00	0058747753	37 X 37	39 X 39	0058754850
BGA 680	39 X 39	40 X 40	1.00	0058747874	42 X 42	44 X 44	0058747987
BGA 540	32 X 32	44 X 44	1.27	0058747763	46 X 46	48 X 48	0058747778
BGA 119	7 X 7	14 X 22	1.27	0058747977	15.5 X 23.5	16.5 X 24.5	0058747974
BGA 357/361	19 X 19	25 X 25	1.27F	0058747850Δ	27 X 27	29 X 29	0058747781Δ
BGA 624	24 X 26	35 X 35	1.27F	0058747753	37 X 37	39 X 39	0058754848
BGA 192/217	17 X 17	23 X 23	1.27P	0058747764	25 X 25	27 X 27	0058747861
BGA 256/272/292	20 X 20	27 X 27	1.27P	0058747927	29 X 29	31 X 31	0058747966
BGA 304	23 X 23	31 X 31	1.27P	0058747906	33 X 33	35 X 35	0058747911
BGA 388	26 X 26	35 X 35	1.27P	0058747753	37 X 37	39 X 39	0058747779
BGA 432	31 X 31	40 X 40	1.27P	0058747874	42 X 42	44 X 44	0058747859
BGA 560	33 X 33	43 X 43	1.27P	0058747763	46 X 46	48 X 48	0058747897
BGA 313	25 X 25	35 X 35	1.27S	0058747753	37 X 37	39 X 39	0058747894
BGA 225	15 X 15	27 X 27	1.5F	0058747927	29 X 29	31 X 31	0058747782Δ

Component	Matrix	Component Body Size	Pitch (mm)	Nozzle Catalog No.	Nozzle I.D. (mm)	Nozzle O.D. (mm)	Template Catalog No.
PLCC 20	-	10 X 10	1.27	0058747848	12 X 12	13 X 13	0058754808
PLCC 28	-	12.5 X 12.5	1.27	0058747904	13.5 X 13.5	14.3 X 14.3	0058754809
PLCC 44	-	17.5 X 17.5	1.27	0058747833	18 X 18	20 X 20	0058754810Δ
PLCC 52	-	20.2 X 20.2	1.27	0058754770Δ	21 X 21	23 X 23	0058754811Δ
PLCC 68	-	25.2 X 25.2	1.27	0058747850Δ	27 X 27	29 X 29	0058754812Δ

**Notes:**

(Δ) Denotes Make To Order. Contact us for a quote and lead-time.

Quad Flat Packs can be reworked using hot air nozzles found on page 28 (adapter #0058759970 required).

**Pitch Key:**

**P** = Perimeter Matrix  
**S** = Staggered Matrix  
**F** = Full Matrix

# WAD101 Digital Shop Air Hot Air Station



**The Weller Advantage**

- Features digital temperature control with easy to read LED display for fast and accurate temperature set of the hot air
- Programmable using the optional WCB1 control module. Allows for temperature lockout for process control, temperature setback and °F to °C conversion

WAD101 includes: HAP1 hot air pencil, PH60 stand and sponge.

**Applications:**

- Rework and repair of SMT boards. Sensitive applications requiring non-contact hot air. Some ground planes and multi-layer boards.

**Additional Product Features and Benefits:**

- Air flow is adjustable using knob on the side of the power unit
- Compact design is ideal for soldering, desoldering, and rework of SMT components
- Uses fast acting shop air or compressed nitrogen
- Air flow is actuated by a finger switch on the hot air pencil
- Full range of hot air nozzles is available on page 21
- ESD safe to protect sensitive components

Station	WAD101	Pencil	HAP1
Voltage	120V (input); 24V (output)	Power Consumption	100W
Power Consumption	100W	Heating Element Type	Nichrome Wound, fiberglass and ceramic insulated
Temperature Range	122°F - 1022°F (50°C - 550°C)	Iron Cord Length	4 ft. (1.22 m)
Footprint	4 1/2 X 5 15/16 X 3 5/8 IN (114 X 150 X 91 MM)	ESD Safe?	Yes
Weight (Power Unit Only)	3.9 lb. (1.78 kg)	Standard Nozzle	0058727821
Air Flow Volume	1 l/min. - 6 l/min.	Iron Stand	KH27 (0051502799)
Temperature Accuracy	± 50°F - (30°C )		
ESD Safe?	Yes		



# WRS1001 Digital Self-contained Hot Air Station

## The Weller Advantage

- Features digital temperature control with easy to read LED display for fast and accurate temperature set of the hot air
- Programmable using the optional WCB1 control module. Allows for temperature lockout for process control, temperature setback and °F to °C conversion



WRS1001 includes: HAP1 100 watt hot air pencil, PH60 stand and sponge.

### Additional Product Features and Benefits:

- Internal rotary pump means no need for shop air
- Air flow is adjustable digital electronics on the front panel
- Compact design is ideal for soldering, desoldering, and rework of SMT components
- Air flow is actuated by a finger switch on the hot air pencil
- Full range of hot air nozzles is available on page 21
- Special ionizing circuit assures that hot air is static free to protect sensitive components

Station	WRS1001
Voltage	120V (input); 24V (output)
Power Consumption	175W
Temperature Range	150°F - 980°F (66°C - 511°C)
Footprint	9.5 X 10.6 X 4.1 IN (241 X 269 X 104 MM)
Weight (Power Unit Only)	12.9 lb. (5.85 kg)
Pump Type	Rotary Vane
Air Flow Volume	1 l/min. - 10 l/min.
Temperature Accuracy	+/-50°F (30°C)
Temperature Stability	+/-10°F (6°C)
ESD Safe?	Yes

### Applications:

- Rework and repair of SMT boards. Sensitive applications requiring non-contact hot air. Some ground planes and multi-layer boards. Heat shrink tubing.



The HAP1 desoldering a component.

# WHA500 Digital Self-contained Hot Air Station

Available January 2003.



WHA500

**The Weller Advantage**

- Digital control electronics displays both the set and read temperatures.
- A sensor in the heating element reads the hot air temperature and displays it on the digital display
- Gives you maximum control over the process to avoid thermal stress on sensitive components.

**Applications:**

- Rework and repair of SMT boards. Sensitive applications requiring non-contact hot air. Most ground plane and multi-layer board applications

**Additional Product Features and Benefits:**

- Air flow volume is adjustable using the knob on the front panel
- Air temperature is adjustable to accommodate most SMT rework applications
- A quiet, reliable, trouble-free internal pump generates the air flow – no need for an external air source
- A one-minute cool-down mode is activated when the power switch is turned off, which reduces nozzle temperature prior to nozzle change
- The air delivery tube is flexible to prevent the air flow from being interrupted
- A carry handle is mounted on the top of the housing for portability
- The WHA500 is compatible with the current Weller hot air nozzles
- The air flow is antistatic, so sensitive components are not harmed
- A complete range of nozzles is available – see page 28

Station	WHA500
Input Voltage	120V
Output Voltage	120V
Power Consumption	350W
Temperature Range	122°F - 1022°F (50°C - 550°C)
Footprint	6 5/8 X 8 1/8 X 3 7/8 in. (168 X 206 X 98 mm)
Weight	9 lb. (4.1 kg)
Air Flow Volume	3 l/min – 30 l/min.
Temperature Accuracy	+/- 86°F (55°C)
ESD Safe?	Yes
Heating Element Type	Nichrome wound, Fiberglass and ceramic insulated
Standard Nozzle	No nozzle included - order separately

# WHA2000 Analog Self-contained Hot Air Station

## The Weller Advantage

- The hand piece and nozzle have built in vacuum pick up. Simply activate the vacuum with the foot pedal and lift the component off of the board with the nozzle when the solder reflows



WHA2000

### Additional Product Features and Benefits:

- An internal turbine generates the air flow - no need for shop air
- High performance 750-watt hand piece can handle more demanding rework applications
- Electronic control allows you to precisely control the hot air temperature which helps avoid thermal stress on the target component
- Vacuum for component pickup is activated by the foot switch
- Complete range of nozzles is available on page 28
- Special ionizing circuit assures that hot air is static free to protect sensitive components

Station	WHA2000
Voltage	120V (input); 120V (output)
Power Consumption	820W
Temperature Range	122°F - 1022°F (50°C - 550°C)
Weight (Power Unit Only)	20.35 lb. (9.26 kg)
Pump Type	Turbine
Air Flow Volume	10 l/min. - 50 l/min.
Temperature Accuracy	+/-86°F (55°C)
ESD Safe?	Yes
Heating Element Type	Nichrome wound, fiberglass and ceramic insulated
Standard Nozzle	No nozzle included - order separately

### Applications:

- Rework and repair of SMT boards. Sensitive applications requiring non-contact hot air. Most ground planes and multi-layer boards.



**Step 1:** Hot air is directed onto the leads of the QFP component.

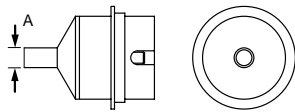


**Step 2:** The nozzle is lowered onto the component to effect reflow and engage the component to the vacuum pick-up.



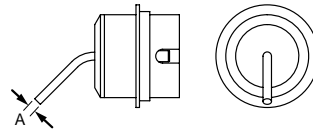
**Step 3:** The component is lifted off the board using the built-in vacuum pick-up.

# Nozzles for WHA500 and WHA2000



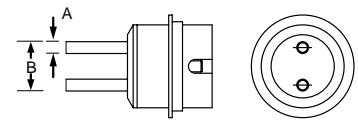
**Round (No Vacuum)**

Cat. No.	A		B	
	in.	mm	in.	mm
0058736881	0.098	2.50	--	--
0058736867	0.157	4.00	--	--
0058736870	0.276	7.00	--	--
0058736836 $\Delta$	0.453	11.50	--	--



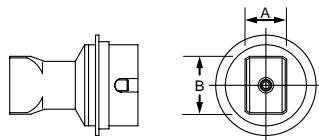
**Round Bent (No Vacuum)**

Cat. No.	A		B	
	in.	mm	in.	mm
0058736882	0.059	1.50	--	--



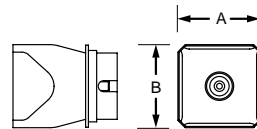
**Round Dual (No Vacuum)**

Cat. No.	A		B	
	in.	mm	in.	mm
0058736883	0.098	2.50	0.374	9.50



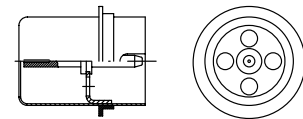
**2-Sides Heated**

Cat. No.	A		B	
	in.	mm	in.	mm
0058736840	0.583	4.80	0.846	21.50
0058736842	0.394	10.00	0.551	14.00
0058736843	0.421	10.70	0.421	10.70
0058736841	0.472	12.00	0.748	19.00
0058736876 $\Delta$	0.472	12.00	1.063	27.00
0058736857 $\Delta$	1.496	38.00	1.496	38.00
0058736873 $\Delta$	1.575	40.00	1.575	40.00



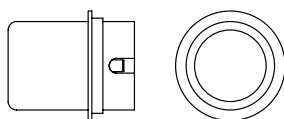
**4-Sides Heated**

Cat. No.	A		B	
	in.	mm	in.	mm
0058736839	0.433	11.00	0.433	11.00
0058736818	0.583	14.80	0.583	14.80
0058736814	0.709	18.00	0.709	18.00
0058736807	0.807	20.50	0.807	20.50
0058736804	1.024	26.00	1.024	26.00
0058736833	1.260	32.00	1.260	32.00
0058736891	1.417	36.00	1.417	36.00
0058736890 $\Delta$	1.693	43.00	1.693	43.00
0058736838	0.394	10.00	0.571	14.50
0058736880 $\Delta$	0.472	12.00	0.945	24.00
0058736837	0.512	13.00	0.610	15.50
0058736892 $\Delta$	0.551	14.00	1.063	27.00
0058750721	0.669	17.00	0.925	23.50
0058736877 $\Delta$	0.669	17.00	1.142	29.00
0058736998 $\Delta$	0.906	23.00	1.398	35.50
0058736999 $\Delta$	1.201	30.50	1.909	48.50
0058736858 $\Delta$	1.260	32.00	1.732	44.00
0058750709 $\Delta$	1.496	38.00	1.909	48.50
0058750714 $\Delta$	1.496	38.00	2.402	61.00



**Measuring**

Cat. No.	A		B	
	in.	mm	in.	mm
0058736875 $\Delta$	N/A		N/A	



**Adapter for Hakko Nozzles**

Cat. No.	A		B	
	in.	mm	in.	mm
0058750722	N/A		N/A	

**Notes:**

( $\Delta$ ) Denotes Make To Order. Contact us for a quote and lead-time.

Cat. No.	Page	Cat. No.	Page	Cat. No.	Page	Cat. No.	Page	Cat. No.	Page
0054414199	.21	0058747906	.23	ETT	.5	MT607	.11	PTE8	.13
0054414399	.21	0058747911	.23	ETU	.5	MT608	.11	PTF7	.13
0054414499	.21	0058747927	.23	ETV	.5	MT609	.11	PTF8	.13
0054414699	.21	0058747929	.23	HAP1	17, 18, 19, 20, 24, 25	MT610	.11	PTH6	.13
0054414799	.21	0058747930	.23	LT1	.9	MT611	.11	PTH7	.13
0058727774	.21	0058747931	.23	LT1L	.9	MT613	.11	PTH8	.13
0058727775	.21	0058747932	.23	LT1LX	.9	MT614	.11	PTJ7	.13
0058727776	.21	0058747934	.23	LT1S	.9	MT617	.11	PTJ8	.13
0058727777	.21	0058747935	.23	LT1SLX	.9	MT620	.11	PTK6	.13
0058727778	.21	0058747945	.23	LT1X	.9	NT1	.7	PTK7	.13
0058727779	.21	0058747954	.23	LT4W	.9	NT1S	.7	PTK8	.13
0058727780	.21	0058747956	.23	LT4X	.9	NT1X	.7	PTKX6	.13
0058727781	.21	0058747958	.23	LTA	.9	NT4	.7	PTL7	.13
0058727782	.21	0058747959	.23	LTAS	.9	NT6	.7	PTL8	.13
0058727783	.21	0058747961	.23	LTAX	.9	NTA	.7	PTM7	.13
0058727784	.21	0058747963	.23	LTB	.9	NTAX	.7	PTM8	.13
0058727785	.21	0058747964	.23	LTC	.9	NTB	.7	PTO6	.13
0058727786	.21	0058747966	.23	LTCs	.9	NTC	.7	PTO7	.13
0058727787	.21	0058747973	.23	LTD	.9	NTD	.7	PTO8	.13
0058727821	.21	0058747974	.23	LTF	.9	NTGW	.7	PTP6	.13
0058727822	.21	0058747977	.23	LTH	.9	NTH	.7	PTP7	.13
0058727823	.21	0058747987	.23	LTHX	.9	NTK	.7	PTP8	.13
0058736804	.28	0058750709	.28	LTK	.9	NTSMT01	.7	PTR6	.13
0058736807	.28	0058750714	.28	LTKN	.9	NTSMT02	.7	PTR7	.13
0058736814	.28	0058750721	.28	LTL	.9	NTSMT03	.7	PTR8	.13
0058736818	.28	0058750722	.28	LTM	.9	NTSMT04	.7	PTS6	.13
0058736833	.28	0058754760	.23	LTS	.9	NTSMT05	.7	PTS7	.13
0058736836	.28	0058754761	.23	LTSMT01	.9	NTSMT06	.7	PTS8	.13
0058736837	.28	0058754762	.23	LTSMT02	.9	NTSMT07	.7	PTT8	.13
0058736838	.28	0058754763	.23	LTSMT03	.9	NTSMT08	.7	PTZ7	.13
0058736839	.28	0058754770	.23	LTSMT04	.9	NTSMT09	.7	PU120T	.12
0058736840	.28	0058754777	.23	LTSMT05	.9	NTSMT10	.7	TC201T	.12
0058736841	.28	0058754779	.23	LTSMT06	.9	NTSMT11	.7	WAD101	.24
0058736842	.28	0058754808	.23	LTSMT07	.9	NTSMT12	.7	WDD81V	.14
0058736843	.28	0058754809	.23	LTSMT08	.9	NTSMT13	.7	WDD81VIL	.14
0058736857	.28	0058754810	.23	LTSMT09	.9	NTSMT14	.7	WES51	.3
0058736858	.28	0058754811	.23	LTSMT10	.9	NTSMT15	.7	WES51PU	.3
0058736867	.28	0058754812	.23	LTSMT11	.9	NTSMT16	.7	WESD51	.4
0058736870	.28	0058754838	.23	LTSMT12	.9	NTSMT17	.7	WESD51PU	.4
0058736873	.28	0058754841	.23	LTSMT13	.9	NTSMT18	.7	WHA2000	.20, 27
0058736875	.28	0058754847	.23	LTSMT14	.9	NTSMT19	.7	WHA500	.26
0058736876	.28	0058754848	.23	LTSMT15	.9	NTSMT20	.7	WHP81	.6
0058736877	.28	0058754849	.23	LTSMT16	.9	NTSMT21	.7	WMP	.6
0058736880	.28	0058754850	.23	LTSMT17	.9	NTSMT22	.7	WMPH	.6
0058736881	.28	0058754945	.23	LTSMT18	.9	PES51	.3, 4	WPH80	.17, 18, 19, 20
0058736882	.28	AK20	.14, 15, 16	LTSMT19	.9	PH1201ESD	.12	WPH81	.8
0058736883	.28	AK51	.17, 18, 19, 20	LTSMT20	.9	PH50	.3, 4	WQB3000	.22
0058736890	.28	AKV	14, 15, 16, 17, 18, 19, 20	LTSMT21	.9	PH60	17, 18, 19, 20, 24, 25	WRS1001	.15, 18, 25
0058736891	.28	DS80	.14, 15, 16	LTSMT22	.9	PTA6	.13	WRS10011	.15
0058736892	.28	DSV80	.14, 15, 16, 17, 18, 19, 20	MT1205	.11	PTA7	.13	WRS10012	.15
0058736998	.28	ETA	.3, 4, 5	MT1500	.10	PTA8	.13	WRS2000	.19, 20
0058736999	.28	ETAA	.5	MT1501	.10	PTAA7	.13	WRS3000	16, 17, 18, 19, 20
0058747753	.23	ETAB	.5	MT1502	.10	PTAA8	.13	WRS3000S	.17
0058747763	.23	ETBB	.5	MT202	.11	PTB6	.13	WRS3000ST	.17
0058747764	.23	ETC	.5	MT203	.11	PTB7	.13	WRS3000V1	.16
0058747778	.23	ETCC	.5	MT204	.11	PTB8	.13	WRS3000V2	.16
0058747779	.23	ETDD	.5	MT211	.11	PTBB7	.13	WRS4000	.18
0058747781	.23	ETD	.5	MT212	.11	PTBB8	.13	WRS5000	.19
0058747782	.23	ETDD	.5	MT220	.11	PTC6	.13	WRS7000	.20
0058747833	.23	ETH	.5	MT221	.11	PTC7	.13	WSD161	.8
0058747848	.23	ETJ	.5	MT301	.11	PTC8	.13	WSD81	.8
0058747850	.23	ETK	.5	MT302	.11	PTCC7	.13	WSD81PU	.8
0058747859	.23	ETKN	.5	MT303	.11	PTCC8	.13	WSL	.6
0058747861	.23	ETL	.5	MT601	.11	PTD6	.13	WSL2	.6
0058747874	.23	ETM	.5	MT602	.11	PTD7	.13	WSL2PU	.6
0058747894	.23	ETO	.5	MT603	.11	PTD8	.13	WSLPU	.6
0058747897	.23	ETP	.5	MT604	.11	PTDD7	.13	WSP80	6, 8, 16, 17, 18, 19, 20
0058747899	.23	ETR	.5	MT605	.11	PTDD8	.13	WTA50	.17, 18, 19, 20
0058747904	.23	ETS	.5	MT606	.11	PTE7	.13	WTCPT	.12







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