

LE40V Benchtop Automated Pick & Place with Vision Centering

Your Economic Solution for:

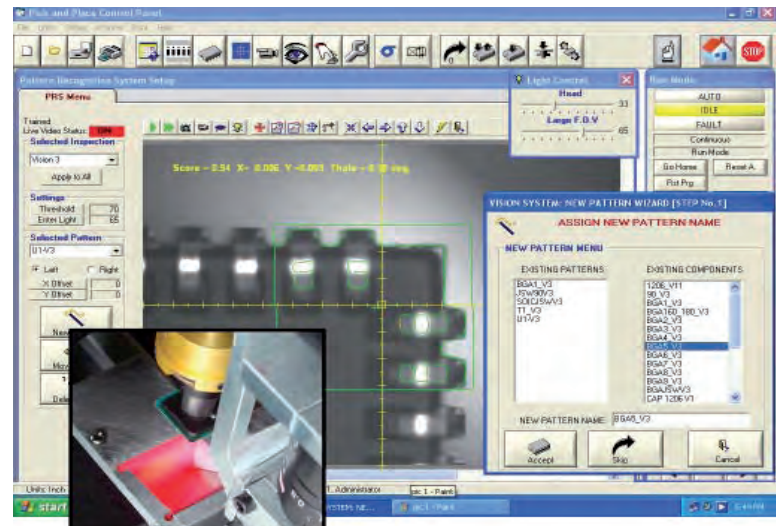
- Prototyping
- Product Development
- Short Run, High-Mix
- Manufacturing Applications



- Technologically Advanced Features in a Small, Space Saving Footprint
- Increased Placement Accuracy with Cognex® Vision System and on-the-fly component centering
- Place virtually all SMT components with a benchtop unit.
- User Friendly Programming and Operation

System Features

- Placement rates up to 3000 cph with accuracy $\pm 0.001''$
- Place virtually all SMT components from 0201 discreets, ultra micro BGAs, CSPs, and 15 mil pitch QFPs
- Friendly, easy to use Windows® based software for panelized boards, self-diagnostics, error recognition, fault monitoring and more
- Standard self-contained vacuum eliminates need for costly external air source
- Cognex® Vision System with fiducial correction, bad board mark, and pattern recognition
- Handle loose and tube components with the optional vibratory feeder with frequency and amplitude control
- Conveniently use short tape strips with our Unique SuperStrip™ feeders in 8, 12, 16, 24, 32, 44, and 56mm



Vision System

The BGA being centered appears on the software window. the LE40V vision centering pick & place system uses the full features of Cognex® Vision.

PRODUCT SPECIFICATIONS:

Max. Placement Rate	3000 cph
Typical Verifiable Placement Rate	1800 - 2500 cph
Placement Accuracy	±0.001" (0.025mm)
Smallest Component Capability	0201
Fine Pitch Capability	15 mil pitch (0.381mm)
Largest Component Size	2" (50mm) square body
Tape Feeders	8,12,16, 24, 32, 44mm (Electrical)
Tube Feeders (Bulk Also)	Sized to fit any component (Manual Frequency & Amplitude Control)
Bank Feeders for Taped Components	12 - 8mm Lanes
Matrix Tray Feeders	with Board/Matrix Tray Holders
Component Orientation Ø-Axis Motion	±360° in 0.18° steps
Z-Axis Max. Travel	1.5" (38mm)
Max. Travel Area	22" (560mm) x 22" (560mm)

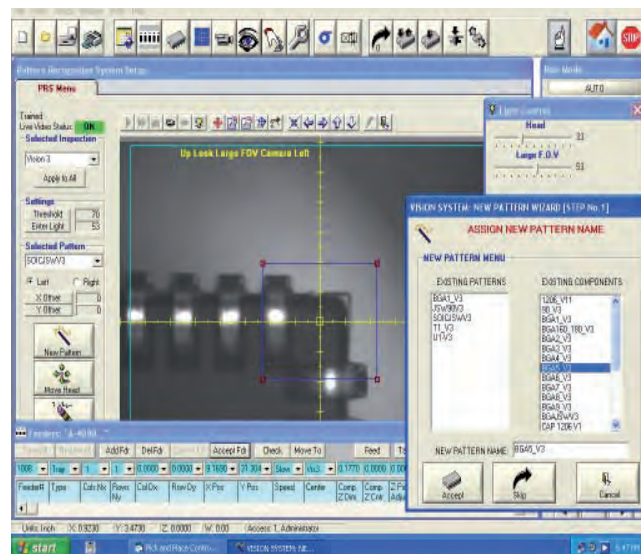
Vision Resolution	up to 10µm
Digital Light Control	up to 4 illuminations
Cognex® Vision System	Standard
Automatic Tool Changer	up to 8 positions
Automatic fiducial & bad board mark recognition	Standard
Data Entry	Coordinate entry, "teach" mode, CAD download
Dispenser option (5, 10, & 30cc time & pressure)	up to 10,000 dots/hr
Automatic 4 Position Nozzle Changer	Standard
Compressed Air	Shop air required only for dispenser option, 60psi
Operating System	Microsoft® Windows® XP
System Dimensions	40" x 42" x 27" (1016 x 1067 x 686mm)
Weight	250 lbs (113kg)
Power	120 VAC, 50/60Hz (220-240 VAC available)

Options

L-CL.....	Cyberoptics® Centering Laser
L-LD.....	Liquid Dispenser
L-TS.....	Touch Screen with Enhanced Operator Interface

Feeder Options

L-VF.....	Vibratory Tube/Bulk Feeder
L-T (tape feeders).....	8, 12, 16, 24, 32, & 44mm
L-BF-12 (bank feeders).....	12 lane bank feeder for 8mm tape
L-MBH.....	Matrix Tray Holder
L-SS-XX.....	Dual Lane SuperStrip™ feeder for strips from 1" to 12" long (XX indicates tape width: 8, 12, 16, 24, 32, 44, and 56mm)



The Windows® based vision software is easy to learn and use, requiring minimal operator training.

Leasing Options Available...

For more information, phone us at +1-610-337-3050 or email us at info@ddmnovastar.com



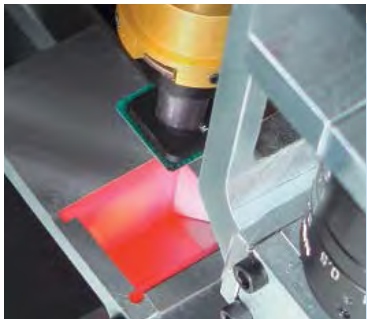
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Automated pick & place with vision centering

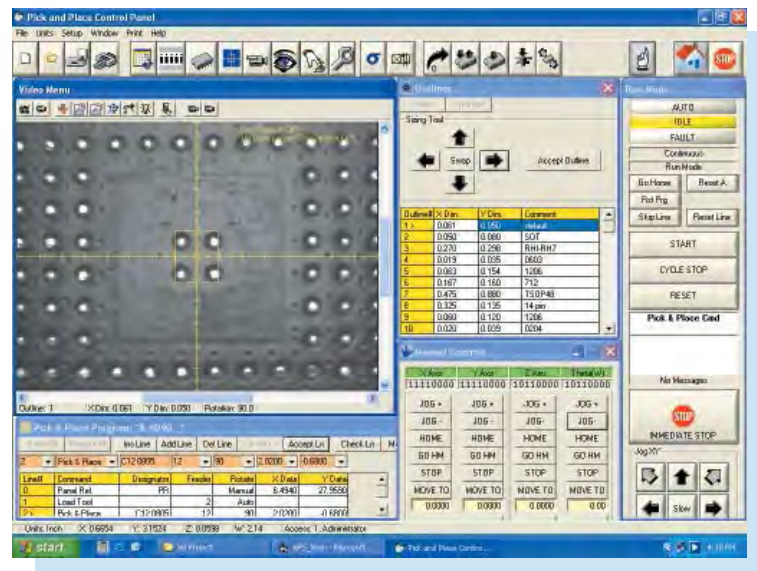


Model LS60V shown



Vision System

The BGA being centered at the left appears on the software window shown at the right. The LV-series vision centering pick and place systems use the full features of Cognex® vision.



Components

The Cognex® vision assist allows accurate placement of 0201s, ultra micro BGAs, CSPs, QFPs and a wide range of virtually all SMT components.

System Features

- Placement rates up to 4800 cph
- Placement accuracy to $\pm 0.001''$
- Capable of placing fine pitch components down to 15 mil
- Resolution of $2\mu\text{m}$ ($0.0000787''$) and accuracy to $\pm 0.001''$
- Cognex® vision system with fiducial correction, bad board mark and pattern recognition
- Optional fluid dispenser

- Friendly, easy to use Windows® based software
- Self-contained vacuum - no shop air needed
- Automatic 4-position nozzle changer
- Accessible, unobstructed work station for operator
- Feeder capability: 144 8mm tape lanes utilizing bank feeders

Feeders

Standard tape feeder sizes include 8mm, 12mm, 16mm, 24 mm, 32mm and 44mm.

The vibratory feeder with frequency and amplitude control can handle loose and tube components.

Unique SuperStrip™ feeders are a convenient way to use short tape strips.

Feeder positions are pre-programmed for quick set-up.

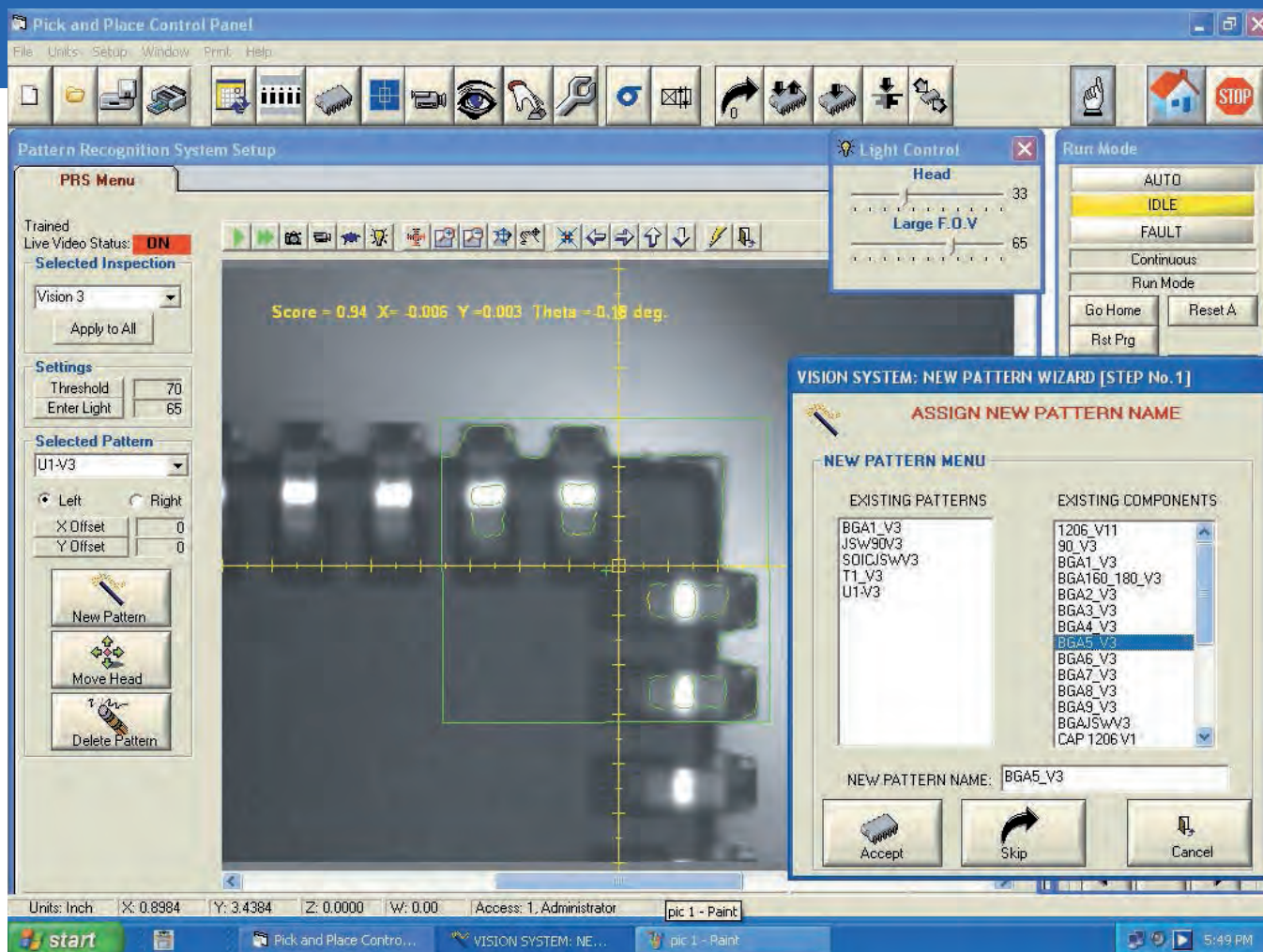
With the optional 12 position 8mm bank feeders, capacity can increase by 50%, i.e. the model LS60V would increase to a capacity of 144 8mm tape feeders.

Fluid Dispenser

Computer controlled in 10 milli-second increments with separate interval/raise-lower speed allows solder paste or adhesive glue to be applied accurately prior to component placement. This time/pressure fluid dispenser has dispense rates up to 10,000 dots per hour.

LS60V and LS40V Standard Features

- On-the-fly component centering with top & bottom cameras
- Automatic 4-position nozzle changer with 4 nozzles
- Friendly easy to use Windows® based software for panelized boards, self diagnostics, error recognition, fault monitoring and more!
- Automatic fiducial correction
- Positional resolution of $0.0000787''$ ($2\mu\text{m}$) with closed loop micro step driven motion control and digital encoders



The vision software is Windows® based to allow easy straightforward teach-in, requiring minimal operator training.

LS40V & LS60V Specifications

Max placement rate	4800 cph
Typical verifiable placement rate	2500-3600 cph
Placement accuracy	±0.001"
Smallest component capability	0201s
Fine pitch capability	15 mil pitch (0.381mm)
Largest component size	2" (50mm) square body
Tape feeders	8, 12, 16, 24, 32, 44 mm (Electrical)
Bank feeders for taped components	12 8 mm lanes
Tube feeders (bulk also)	8, 10, 14, 18, 24, 32 mm (Manual freq. control)
Matrix Tray Feeders	with Board/Matrix tray holders
Component orientation Ø-axis motion	± 360° in 0.18° step
Z axis max travel	1.5" (38 mm)
Max travel area LS40V	22"(X axis) x 22"(Y axis) (560 x 560 mm)
Max travel area LS60V	22"(X axis) x 32"(Y axis) (560 x 813 mm)

System dimensions LS40V	40" x 38" x 53"h (1016 x 1067 x 1346.2 mm)
System dimensions LS60V	40" x 52" x 53"h (1016 x 1321 x 1346.2 mm)
Weight LS40V	370 lbs (168 kg)
Weight LS60V	430 lbs (195 kg)
Cognex® vision system	standard 2 camera (top and bottom)
Vision resolution	up to 10µm
Digital light control	up to 4 illuminators
Automatic 4 position nozzle changer	standard
Operating system	Microsoft Windows™
Dispenser option, 5, 10 & 30cc syringe holder type	up to 10,000 dots/hr.
Power	120 VAC, 50/60Hz, (220-240 VAC available)
Compressed air	Shop air required for dispenser option only, 60 psi
Automatic fiducial & bad board mark recognition	standard
Data entry	Coordinate entry, "teach" mode, CAD download

L-SF40 Benchtop Automated Pick & Place

Your Economic Solution for:

- Prototyping
- Product Development
- Pilot Manufacturing
- Low Volume Production



Features

- Provides the most economical solution in a fully automated pick and place bench-top system
- Capable of placing a wide range of components from 0201 discretes and SOICs to PLCCs and 20 mil pitch QFPs
- Placement rates up to 1800 cph
- Friendly, easy to use Windows® based software
- Tape reels & strips can be set up easily using the unique PIK-Strip™ feeders
- 8, 12, 16, 24, 32 & 44 mm PIK-Strip™ feeders available
- Capable of handling reels, cut tape, stick/tube and loose components

Specifications

Max board area L-SF40 13.5" x 22" (343 x 560 mm)
 Max travel area L-SF40 22"(X axis) x 22"(Y axis) (560 x 560 mm)
 Z axis max travel 1.5" (38 mm)
 Board thickness0.020" - 0.156" (0.5mm - 4.0 mm)
 Typical verifiable placement rate 1200-1800 cph
 Placement accuracy ±0.004"
 Fine pitch capability down to 20 mil pitch (0.508mm)
 Smallest component capability 0201 packages standard
 Largest component size 1.378" (35mm) square body
 L-SF40 max no of lanes72 - 8mm tapes
 PIK-Strip™ available 8, 12, 16, 24 mm
 Tube feeders (bulk also) 8, 10, 14, 18, 24, 32 mm
 Matrix tray feederswith Board/Matrix tray holders
 Component orientation Ø-axis motion ± 360° in 0.18° step
 System dimensions L-SF-40 36" x 38" x 25"h (914 x 965 x 635 mm)
 On-the-fly component centering Centering fingers

Weight L-SF40 200 lbs (91 kg)
 Board holding Edge clamp w/optional board support tooling
 Data entry Coordinate entry, "teach" mode, CAD download
 Vision system Color CCD card camera
 Automatic tool changer 4 position
 Operating system Microsoft Windows
 Dispenser option Time & pressure, clean dry air @ 80 psi required
 Power 120 VAC, 50/60Hz, 220-240 VAC available
 Compressed air 60 psi required for vacuum
 Vacuum option Self contained compressor, no air required

Machine Options

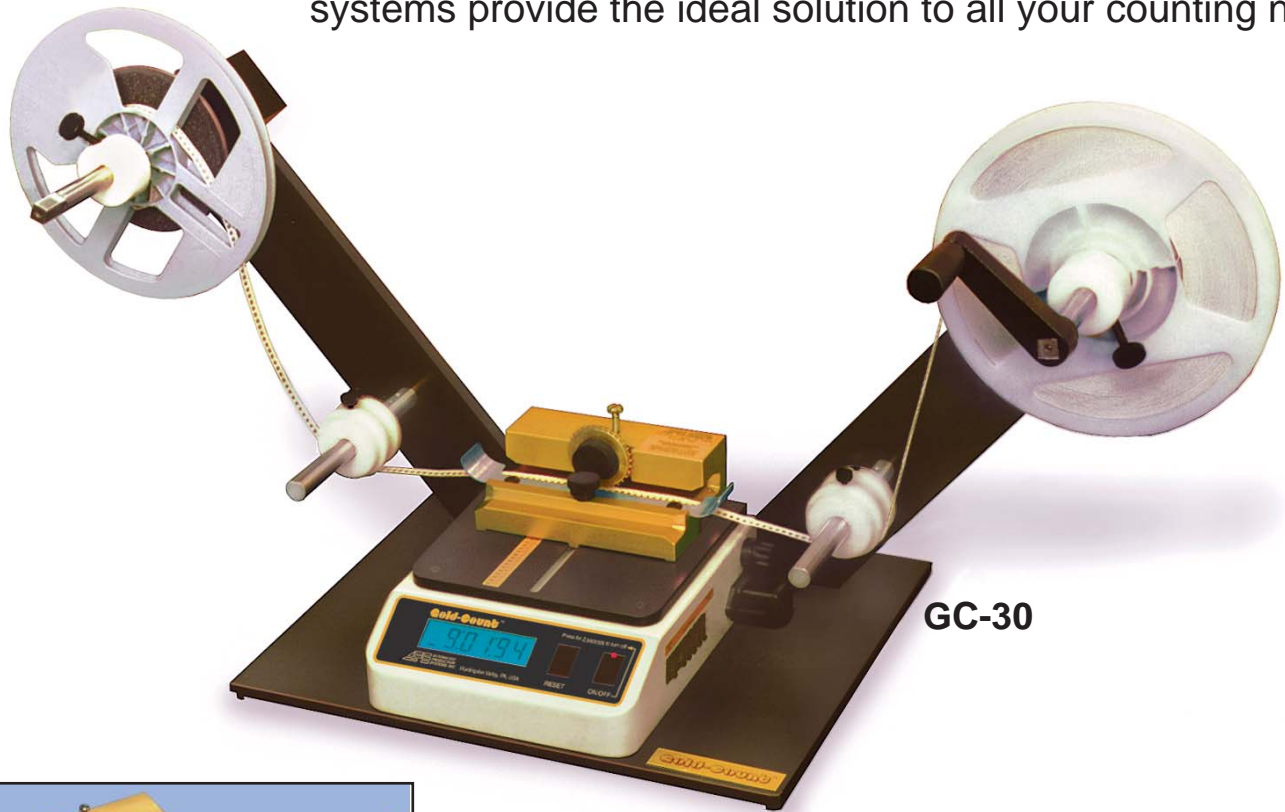
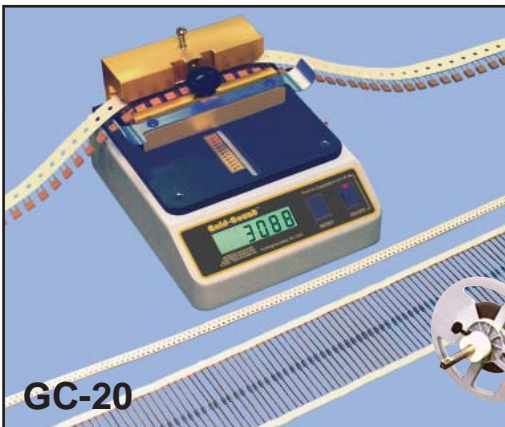
L-SF-LD Liquid dispenser
 L-UCT CAD editor software
 L-SF-AFC Auto fiducial recognition
 L-TS Touch screen with enhanced operator interface
 L-SF-SCV Vacuum - self contained
 L-SF-SC Lexan safety cover
 L-NC4 Extra 4 position nozzle changer - for 8 total positions
 L-BHS Board support
 L-SF-SQ Low force fine pitch squaring station option

Feeder Options

L-PS8 PIK-Strip™ 9x 8mm tape lanes
 L-PS12/16 PIK-Strip™ 4x 12mm & 2x16mm tape lanes
 L-PS24 PIK-Strip™ 4x 24mm tape lanes
 L-MBH Matrix tray holder
 L-SS-XX Dual lane SuperStrip™ feeder for strips up to 13.5" long
 XX indicates tape width: 8, 12, 16, 24, 32, 44, and 56 mm

Taped Axial, Radial & SMT Component Counters

DDM Novastar counters are rugged, reliable, easy to use systems for any type of taped device - Axial, Radial or SMD. Our complete range of precision counting systems provide the ideal solution to all your counting needs

**GC-30****GC-20****GC-40**

SYSTEM FEATURES

- Forward/reverse function makes counting foolproof
- Counts taped SMD, axial and radial components in one unit
- Divide-by feature permits exact count of virtually all types and sizes of components
- Non-contact photoelectric infrared smart sensor
- Push-button marks axial and radial component tape
- Counts up to 100 components/sec.
- 100% guaranteed accuracy & reliability

Taped Axial, Radial & SMT Component Counters



GC-10



GC-12



GC-20



GC-RS



GC-30



GC-40

SPECIFICATIONS

MODEL	DESCRIPTION	FEATURES	REEL STAND
GC-10	Standard Component Counter	<ul style="list-style-type: none"> 4 digit LCD display SMD, axial, radial compatibility 	None
GC-12	Standard Component Counter w/ GC-RS	<ul style="list-style-type: none"> Divide by feature 115 VAC operation (220 V available) 	Deluxe GC-RS
GC-20	Deluxe Component Counter	<ul style="list-style-type: none"> Presettable count with audible beep SMD, Axial, radial capability 	None
GC-30	Deluxe Component Counter w/ GC-RS	<ul style="list-style-type: none"> Divide-by feature AC or battery operation with integral charger 	Deluxe GC-RS
GC-40	Motorized Deluxe Component Counter	<ul style="list-style-type: none"> 5 digit LCD display GC-40 also has Auto Shutoff 	Motorized Deluxe Reel Stand
GC-RS	Deluxe Reel Stand	—	NA

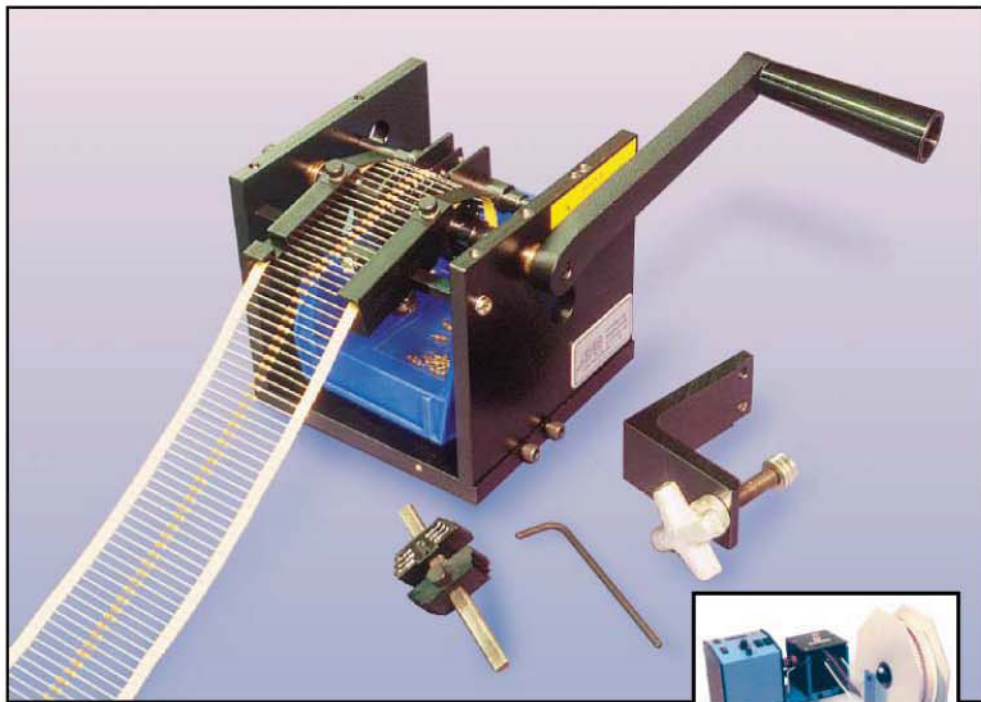
Input	115VAC, 60 Hz, 1Amp (optional 220V 50/60 Hz, 1/2Amp)
Display	0.5" (12.7mm) high 4 digit LCD (GC-10, GC-11, GC-12)
Display	0.5" (12.7mm) high 5 digit LCD (GC-20, GC-30, GC-40)
Max reel diameter	406.4mm (16")
Max leaded component tape width	100mm (4.0")
SMD tape width	0.315" to 2.68" (8 to 68mm)
Max body diameter	1.1" (27.9mm)
Lead diameter	0.01" to 0.11" (0.25 to 2.79mm)
GC-10, GC-20 dim.	165.1 x 203.2 x 127mm (6.5" x 8" x 5")
GC-30 dim.	635 x 280 x 305mm (25" x 11" x 12")
GC-10, GC-20 (counter only) wt.	2.13Kg (4.7 Lbs.)
GC-30 (counter with reel stand) wt.	6.21Kg (13.7 Lbs.)
GC-40 dim.	660 x 356 x 406mm (26" x 14" x 16")
GC-40 weight	10.66Kg (23.5 Lbs.)

MODEL F-1 Axial component Trimmer/Former. High speed output of 26 components per turn. Easy to use set-up gauge.

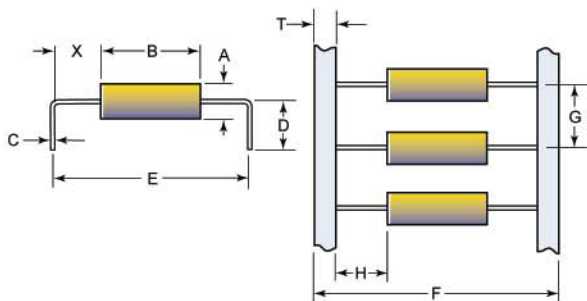
MODEL R-1 Radial component Trimmer. Easily adjustable cut lengths in less than one minute.

Both models are upgradable with motor drive & counter (DAC), reel holder (RH-1) and loose feed (LF-4) for axial components.

Any APS handcrank component former can be mounted on the same motorized drive and counter.



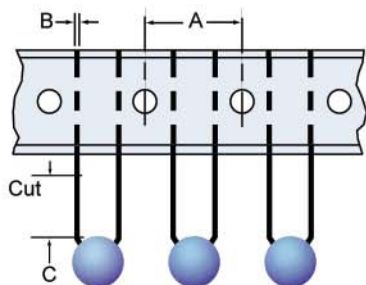
F-1 handcrank axial trimmer/former



F-1 Specs:

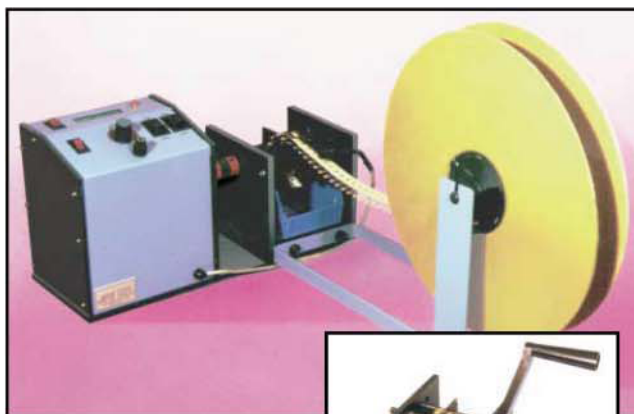
	A Body Dia	B Body Length	C Lead Dia	D Lead Length	E - Lead Center to Center	F Component Width	G Tape Spacing	H- Tape Component Distance	T Tape Width	X- Bend to Body Distance
MIN (in)	0.01	0.00	0.01	0.12	0.20	0.75	0.20	0.15	-	0.035
MIN (mm)	0.25	0.00	0.25	3.05	5.08	19.05	5.08	3.81	-	0.90
MAX (in)	1.00	1.88	0.05*	0.63	2.06	4.63	1.00	2.00	0.375	-
MAX (mm)	25.40	47.75	1.25	16.00	52.33	117.60	25.40	50.80	9.53	-

*With .030 to .050 (0.08 mm to 1.27 mm) tooling

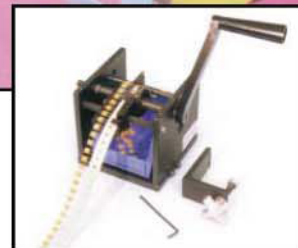


R-1 Specs:

	A Tape Hole Spacing	B Lead Dia.	C Lead Cut Length
MIN (in)	0.500	0.01	0.05
MIN (mm)	12.7	0.25	1.27
MAX (in)	0.500	0.050	0.500
MAX (mm)	12.7	1.25	12.7



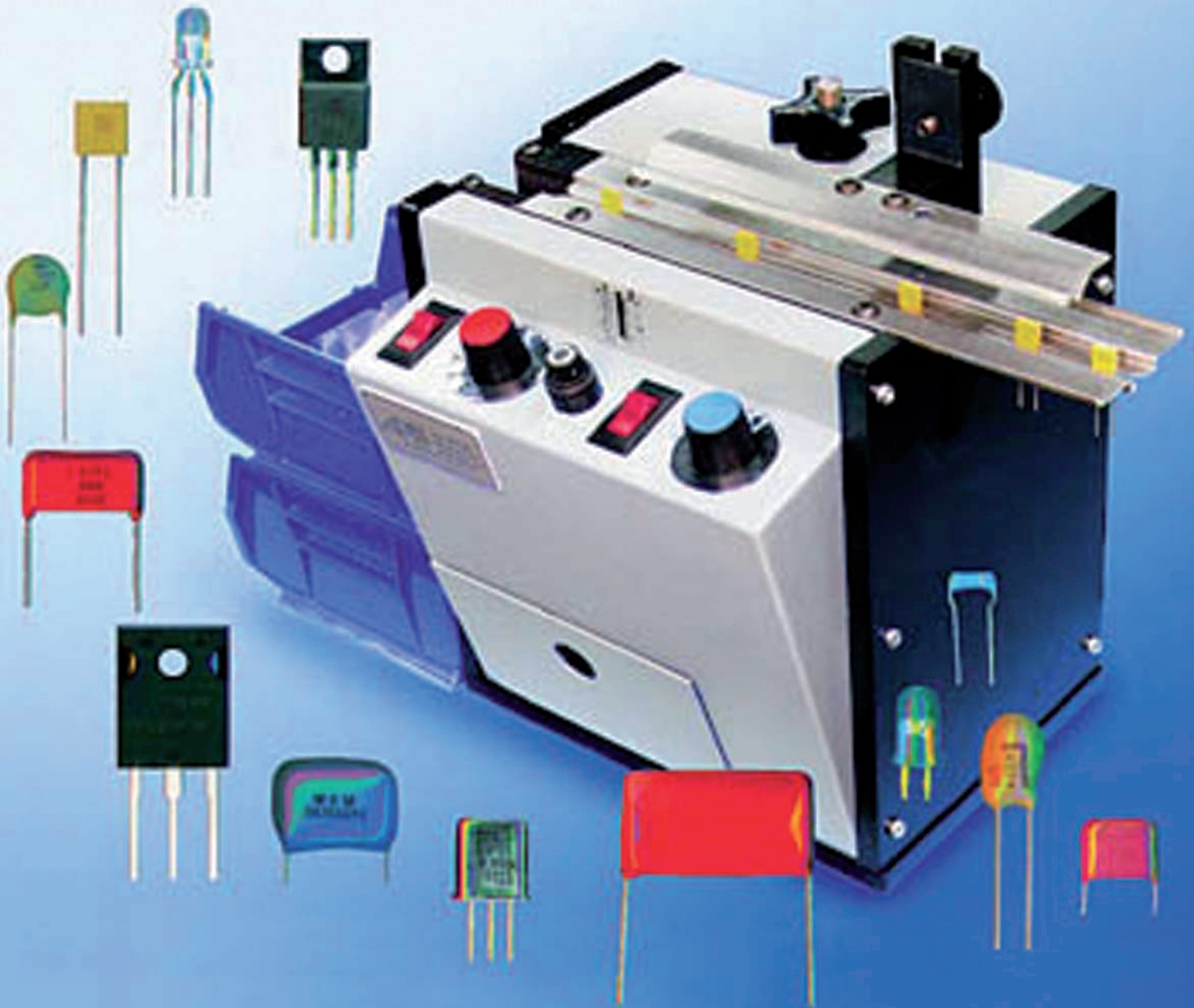
AR-1 radial lead trimmer with motor drive & counter and reel stand



R-1 radial lead trimmer



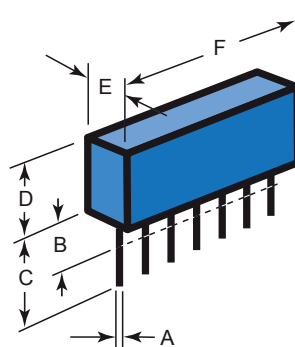
RTV Loose Radial Component Trimming System



Specifications: RTV

	MIN (in)	MIN (mm)	MAX (in)	MAX (mm)
A	0.010	0.25	0.050	1.27
B	0.125*	3.17	0.625	15.88
C	0.125	3.17	2.000	50.80
D	0.030	0.76	1.375	34.93
E	0.030	0.76	0.750	19.05
F	0.040	1.02	4.000	101.60

*Shorter on request
115 VAC, 60Hz (other voltages available)



Versatile Loose Component Trimmer

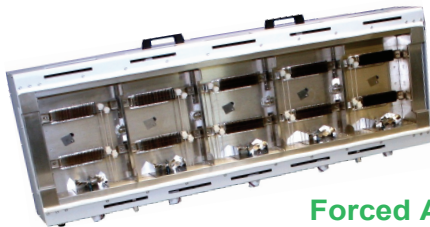
The model RTV's standard tooling routinely processes a wide range of radial components including various capacitors, TO-92s, LEDs, SIPs, and most in-line radial devices. Its horizontal vibratory mechanism provides balance so top heavy components can be processed without falling. Cutting is performed by a true shear action between a serrated rotating cutting disc which grasps the leads, and a reaction blade which delivers a clean precise cut. Cut length is easily adjustable using a knob and a built-in scale. Processing speeds of up to 3,000 cph are typical.

GF-125 HC/HT

Five (5) Zone Horizontal Convection™ Reflow Oven

Your Economic Solution for:

- Prototyping
- Product Development
- Curing Applications
- Short Run, High Mix
Manufacturing Applications



Forced Air Horizontal Convection Heating
provides uniform temperature profiling
across the entire PCB board.

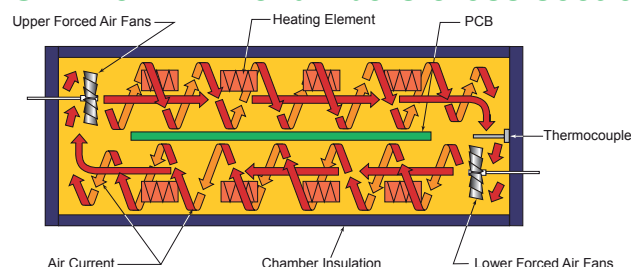
Convection Reflow Oven Features:

- Lead and Lead free Compatible
- 100% forced air Horizontal Convection™ oven **
- 5 vertical heating zones plus cooling zone
- Integrated enclosed stand with 12" wide conveyor
- Stainless steel conveyor and chambers
- Easy lift clamshell design
- Viewing windows with lighted interior
- PC Interface/Windows® software option
- Status Light Tower Option
- Computer controller with:
 - 100 menu profile storage
 - 7 day programmable timer
 - Real time graphic temperature profiler
 - ISO 9000 SPC fault monitoring and reporting
 - Battery memory backup
 - English or metric units
 - Password protection
- Nitrogen gas inerting option

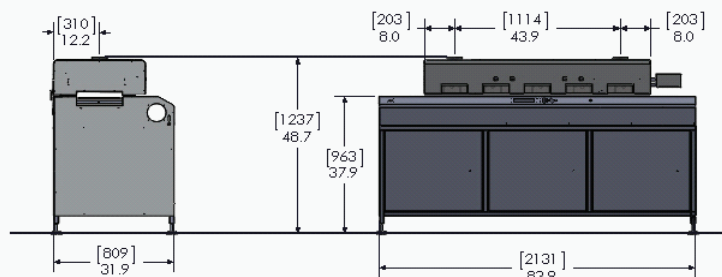
GF-125-HC/HT with HORIZONTAL CONVECTION™

With the patented** Horizontal Convection™ air is circulated horizontally in one direction above the board, and in the opposite direction below the board. This circular air current, or “cyclone” around the board, produces extremely uniform temperature profiles across the board. The model GF-125HTs are high temperature ovens which are compatible with all lead and **lead free soldering** applications.

GF-125HC/HT chambers cross section



The GF-12/120/125 series heating profiles are superior to other ovens in their class. Each of the vertical heating zones is programmable through the controller which stores up to 100 profiles. The oven includes a real-time temperature profiler port. When a thermocouple is attached to the PC board, the actual board level temperature profile is displayed graphically as the board travels through the oven. The conveyor speed, heating elements, cyclonic generators and cooling fans are all programmable. The oven also features SPC fault monitoring & reporting, battery backup and a 7 day timer for automatic machine start-up.



PRODUCT SPECIFICATIONS:

Specifications	GF-125 HC/HT
Max. PCB Width	304mm (12 inches)
Max. PCB Height	35mm (1.375 inches)
Heating Zones	5 top, 5 bottom
Max. Temperature	400°C (752°F)
Heated Tunnel Length	1423mm (56 inches)
Convection	Forced air horizontal convection
Conveyor	Mesh belt
Conveyor Extensions	Yes
Venting	Two (2) 102mm (4") dia. Flanges, 200 CFM each
Cooling Station(s)	One (1)
Cooling Zone Fans	Two (2)
Cyclonic Generators	Ten (10)
Nitrogen Option	Option
PC Interface	Option
Heater (Peak) Power	14.5 kW
Power Requirements	220 VAC, 50/60 Hz, 3Ø , 70 Amp
Length	2133mm (84 inches)
Width	813mm (33 inches)
Height	1245mm (49 inches)



PAK-10 Profile Kit Option

The temperature profiling accessory kit includes all you need to profile PC boards, through your reflow oven. It is compatible with any oven or profiling system that uses standard K-type thermocouples.

Nitrogen Inerting Option

All GF ovens have a nitrogen gas inerting option. With the isolated chamber design (recirculation of atmosphere within reflow zone) low oxygen levels are maintained while conserving nitrogen consumption.

- Decreases wetting angle
- Increases flux efficiency
- Enhances fine pitch solder fillets
- Improves surface finish of solder joints

**Machines covered under Patent 6,936,793

Conveyor and Batch Reflow Ovens



**Lead Free
Soldering
Technology**

Conveyor Reflow Oven Features:

- Lead and Lead free Compatible
- 100% forced air Horizontal Convection™ oven**
- 3 vertical heating zones plus cooling zone
- 12" wide conveyor
- Stainless steel conveyor and chambers
- Easy lift clamshell design
- Viewing windows with lighted interior
- Computer controller with:
 - 100 menu profile storage
 - 7 day programmable timer
 - Real time graphic temperature profiler
 - ISO 9000 SPC fault monitoring and reporting
 - Battery memory backup
 - English or metric units
 - Password protection
- Nitrogen gas inerting option
- PC Interface/Windows® software option
- Enhanced printing option



Batch Oven Features:

- Lead and Lead free compatible
- 100% Cyclonic™ forced air convection
- Unique shuttle system enables higher throughput than standard batch ovens
- Individual time and temperature microprocessor controls make profile set-up easy
- Large top window allows the operator to see the board through the entire process
- All stainless steel interior construction
- Dual cooling stations
- Nitrogen gas inerting option
- Up to 12" x 12" boards

**Patent 6,936,793

All ovens are available with lead free capability
and are made in the USA

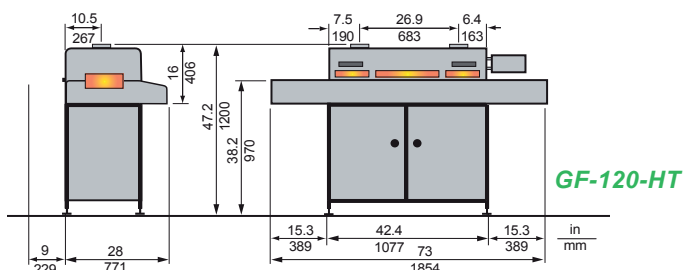
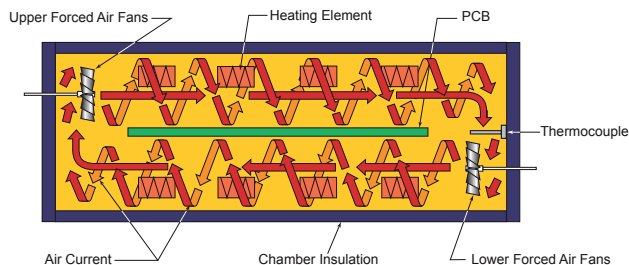


Model
GF-120-HT
shown with
optional stand

GF-120-HT with HORIZONTAL CONVECTION™

With the patented** Horizontal Convection™ air is circulated horizontally in one direction above the board, and in the opposite direction below the board. This circular air current, or "cyclone" around the board, produces extremely uniform temperature profiles across the board. The model GF-120HTs are high temperature ovens which are compatible with all lead and **lead free soldering** applications.

GF-120HT chambers cross section



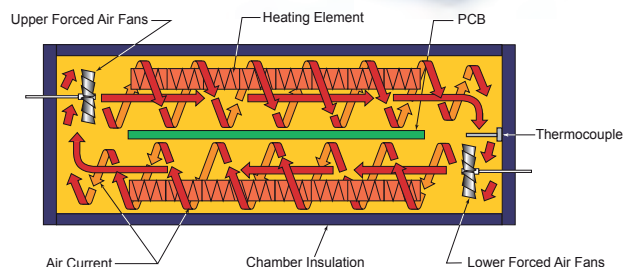
The GF-12/120 series heating profiles are superior to other ovens in their class. Each of the vertical heating zones is programmable through the controller which stores up to 100 profiles. The oven includes a real-time temperature profiler port. When a thermocouple is attached to the PC board, the actual board level temperature profile is displayed graphically as the board travels through the oven. The conveyor speed, heating elements, cyclonic generators and cooling fans are all programmable. The oven also features SPC fault monitoring & reporting, battery backup and a 7 day timer for automatic machine start-up.

**Machines covered under Patent 6,936,793



Model
GF-12-HT

GF-12-HT **



Our patented Horizontal Convection™ technology** circulates heated air in each chamber around the board front to back which increases the thermal efficiency and uniformity within each zone. This exposes the circuit board to a uniform temperature profile along the entire assembly. Cyclonic generator speed is independently set in each zone.



PAK-6 temperature profiling kit

The temperature profiling accessory kit includes all the accessories you need to profile PC boards through your reflow oven. It is compatible with any ovens or profiling systems which use standard K-type thermocouples.



GF-12HT
with stand option

Nitrogen Inerting Option

All GF ovens have a nitrogen gas inerting option. With the isolated chamber design (recirculation of atmosphere within reflow zone) low oxygen levels are maintained while conserving nitrogen consumption.

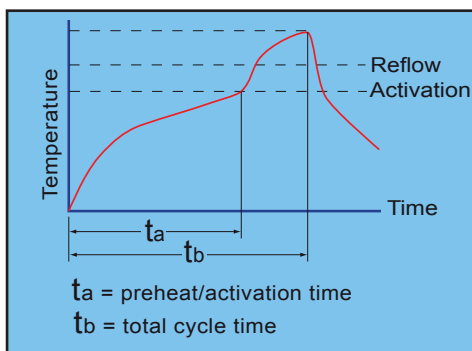
- Decreases wetting angle
- Increases flux efficiency
- Enhances fine pitch solder fillets
- Improves surface finish of solder joints

Conveyor and batch ovens for solder reflow, curing, drying and thermal cycling

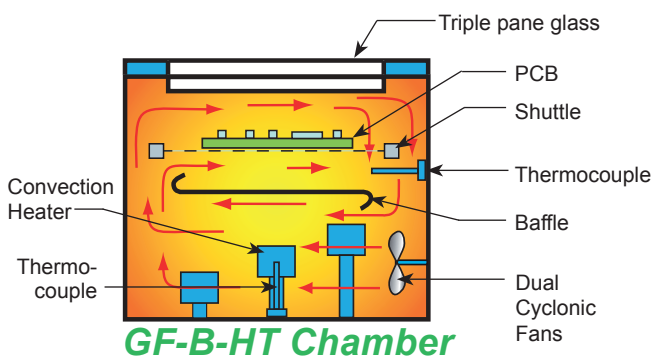


GF-B-HT Batch Oven** Features:

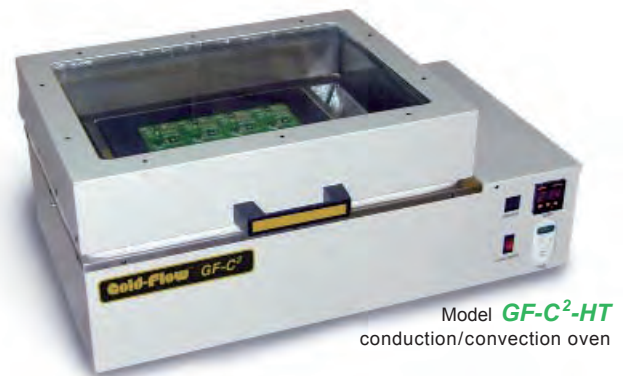
- High temperature GF-B-HT for lead and lead-free soldering
- Unique shuttle system enables higher throughput than standard batch ovens
- Large top window allows the operator to see the board through the entire process
- 100% Cyclonic™ forced air convection
- Independent time and temperature microprocessor controls with membrane keypad make set-up easy
- 99 menu storage with password protection
- All stainless steel interior construction
- Dual cooling stations
- English or metric units
- Nitrogen gas inerting option



GF-B-HT Reflow Profile



GF-B-HT Chamber



GF-C²-HT Batch Oven** or Hot Plate:

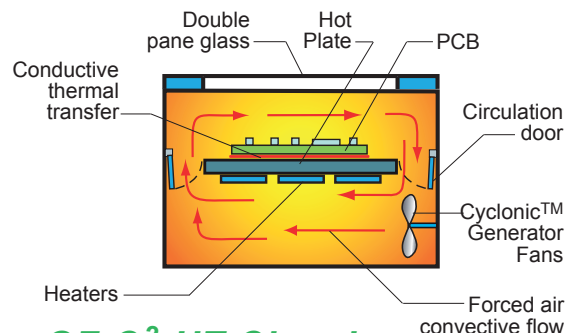
The GF-C²-HT oven is ideal for batch SMT reflow, curing and hot plate applications. With its heavy duty construction and stainless steel chamber, the oven is designed for many years of reliable service.

- Can be used as a batch oven or a hot plate.
- Large heating area of 12" x 12".
- Combination forced air convection/conduction heating for consistent process control.
- Large viewing window allows the operator to see the entire product and process.
- 3/4" thick aluminum heat plate.
- Digital temperature controller precisely and automatically regulates temperatures.
- Programmable digital timer with alarm.
- Nitrogen gas inerting option.



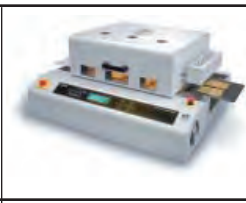
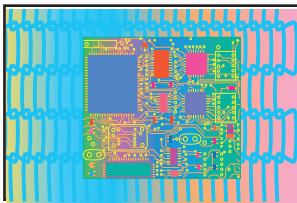
- Model GF-C²-HT for lead free soldering

Model GF-C²-HT with hood up for hot plate use

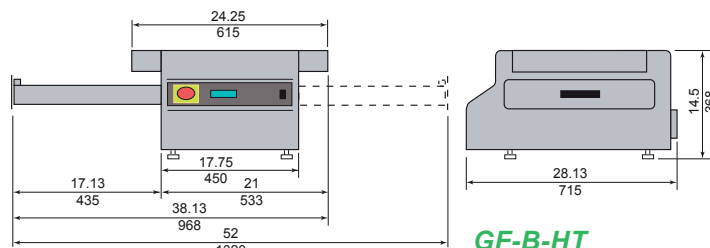
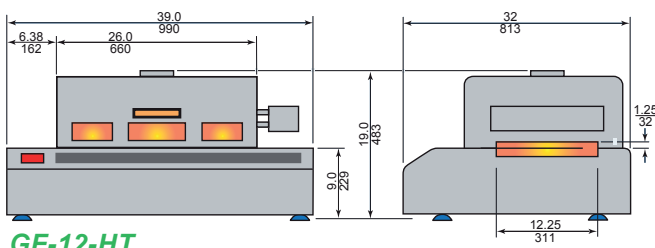


GF-C²-HT Chamber

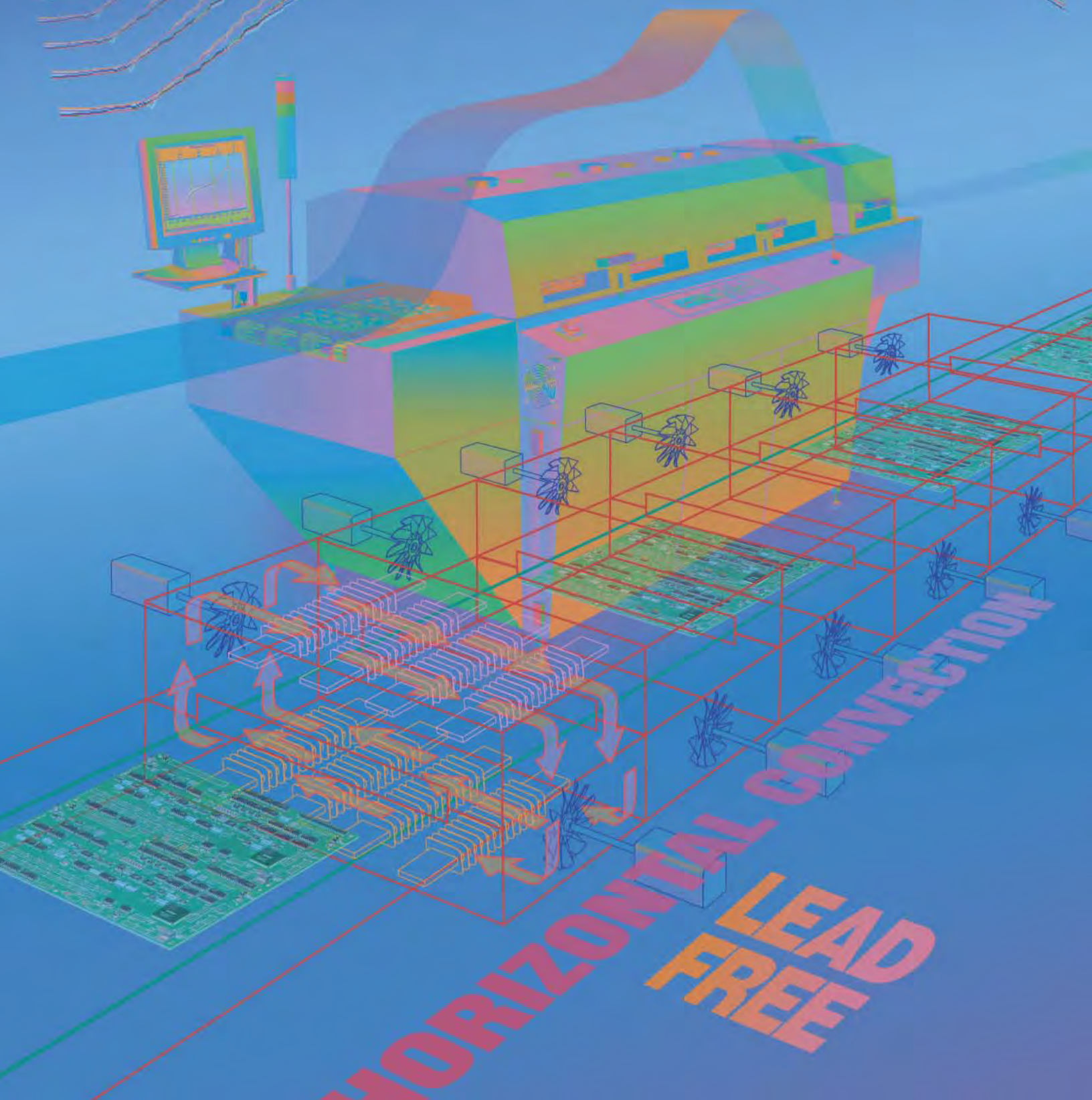
Conveyor and Batch Reflow Ovens



Model:	GF-120-HT	GF-12-HT	GF-B-HT	GF-C²-HT
Heating zones	3 top, 3 bottom	3 top, 3 bottom	1	1
Cyclonics™ (forced air)	3	3	1	1
Conveyor extensions	NA	yes	Dual board shuttle	NA
Electrical power	220 VAC, 50/60 Hz 1Ø (3Ø option), 50A 8.7 Kw	220 VAC, 50/60 Hz 1Ø (3Ø option) 5.5 Kw	15A @220 VAC, 50/60 Hz 1Ø, 2.7 Kw	110 VAC, 50/60 Hz, 20A 220VAC, 50/60 Hz, 10A 1.8 Kw
Max board width	12" (305mm)	12" (305mm)	12" x 12" (305 x 305mm)	12" x 12" (305 x 305mm)
Max board height	1.375" (35mm)	1.375" (35mm)	1.250" (32mm)	3" (76mm)
Cooling station(s)	1	1	2	NA
Max temperature: Lead free compatible	752°F (400°C)	662°F (350°C)	600°F (315°C)	600°F (315°C)
Venting	(2) 4" flanges 100 CFM ea. max.	4" flange 100 CFM max.	4" flange with integral fan	NA
Heating technology	Forced air Horizontal Convection™	Forced air Horizontal Convection™	Forced air convection	Forced air convection
Heat tunnel length	41" (1042mm)	26" (660mm)	NA	NA
Nitrogen option	Yes	Yes	Yes	Yes
Stand option	Yes	Yes	Yes	no
PC interface option	Yes	Yes	no	no
Overall dimensions	73" x 34" x 19"H 1854 x 864 x 483 mm	39" x 32" x 19" H 990 x 813 x 483 mm	38.13" x 28.13" x 14.5" H 968 x 715 x 368 mm	29.12" x 16.5" x 12" H 740 x 420 x 305 mm
Approximate weight	600 lbs (272 kg)	220 lbs (98 kg)	102 lbs (46 kg)	56 lbs (25 kg)



REFLOW OVENS



SMT REFLOW OVENS FOR LEAD FREE REFLOW, CURING & THERMAL CYCLING



Model GF-120-HT with 12" wide conveyor and 41" heated tunnel length shown with optional enclosed stand

Model GF-120-HT

- 3 vertical heating zones plus cooling zone
- Low mass 12" wide stainless steel conveyor
- Easy lift clamshell design compo

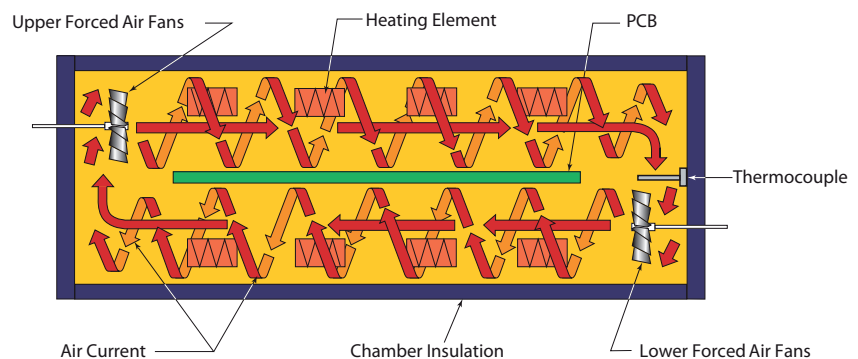
STANDARD FEATURES IN ALL MODELS

- Computer controller with:
 - 100 menu profile storage
 - 7 day timer
 - Real time temperature profiler with graphic display
 - SPC fault monitoring & reporting
 - English or metric units
 - Battery memory backup
 - Password protection
- Horizontal Convection TM technology**
- Cool-down Station
- Low mass stainless steel conveyor
- Stainless steel chambers
- Viewing windows with lights provide full visibility of entire process
- Full access for quick maintenance and easy cleaning
- Unsurpassed performance, service and support

**Machines covered under patent 6,936,793

HORIZONTAL CONVECTION TM

DDM Novastar ovens are used for reflowing solder on PC boards, curing, drying and thermal cycling. Our patented** Horizontal Convection TM system provides the most accurate, most consistent and most repeatable profiles. Air is circulated horizontally in one direction above the board, and in the opposite direction below the board. This circular air current or "cyclone" provides better thermal penetration across the board and yields better results with tough-to-solder components such as BGAs and J-leaded quad flat packs.



Cross-section of chamber (end view)

CURING APPLICATIONS

All models are available with conveyor motor gear reduction, or speed increase, for your curing requirements. Special tunnel heights are available with all models.

Nitrogen Inerting



Novastar's isolated chamber design (recirculation of atmosphere within each chamber) maintains low oxygen levels while conserving nitrogen.

with revolutionary Horizontal Convection

**



Model 1800-HT with 18" wide conveyor and 50" heated tunnel length, shown with edge conveyor and PC interface options



Model 2000-HT with 20" wide conveyor and 72" heated tunnel length shown with PC interface option

Model 1800-HT

- 4 vertical heating zones plus cooling zone
- Low mass 18" wide stainless steel conveyor
- Easy lift clamshell design with gas strut assist
- Status light tower

Model 2000-HT

- 6 vertical heating zones plus cooling zone
- Low mass 20" wide stainless steel conveyor
- Easy lift clamshell design with gas strut assist
- Status light tower

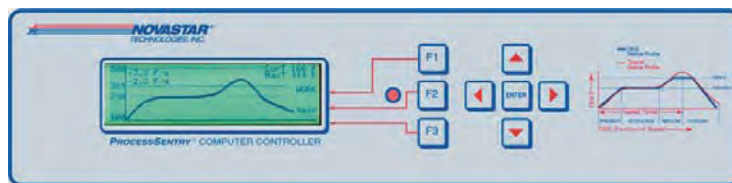
OPTIONS

- Capable of High Temp to 400°C (752°F) for lead free solder
- Status light tower for Model GF-120-HT, (standard on 1800 and 2000)
- Edge rail conveyor (Models 1800 and 2000 only)
- Nitrogen inerting
- PC interface/windows® software
- Enclosed stand (GF-120-HT only)
- Enhanced printing option
- PAK profiling accessory kit
- Custom (curing, drying) applications

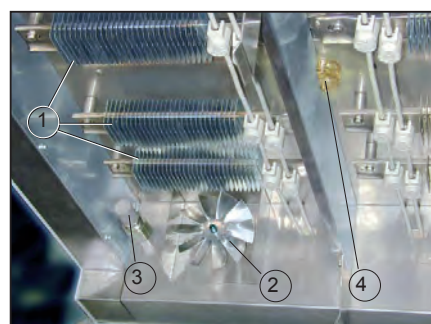
ProcessSentry™ COMPUTER CONTROL

The ProcessSentry™ microprocessor control is the brain of DDM Novastar ovens. All parameters are set and displayed in real time.

The ProcessSentry™ is sophisticated yet clear and straightforward. Programming is intuitive and operation is truly user-friendly. The system provides unrivaled accuracy and repeatability while assuring safety and reliability.



ProcessSentry™ display showing the real-time temperature profile as PC board travels through the oven.

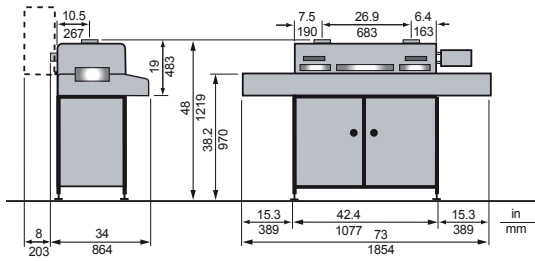


UPPER HEATING ZONE SHOWING :

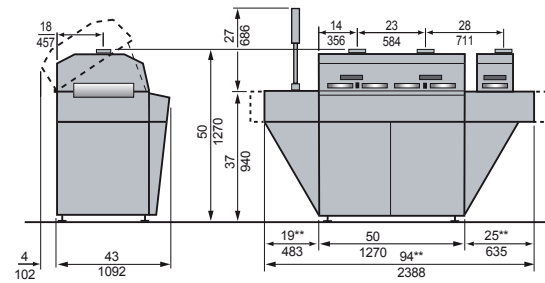
- heating elements (1)
- upper forced turbine (2)
- inert gas suffuser (3)
- interior lighting (4)

REFLOW OVEN SPECIFICATIONS

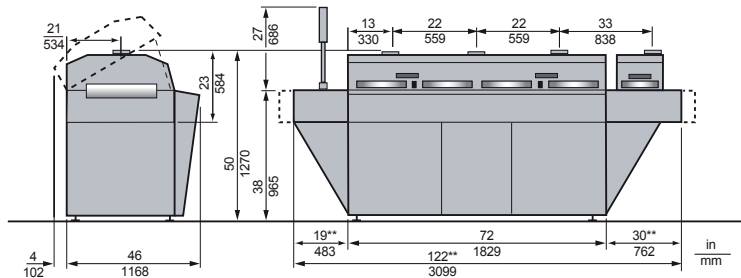
Models GF-120-HT



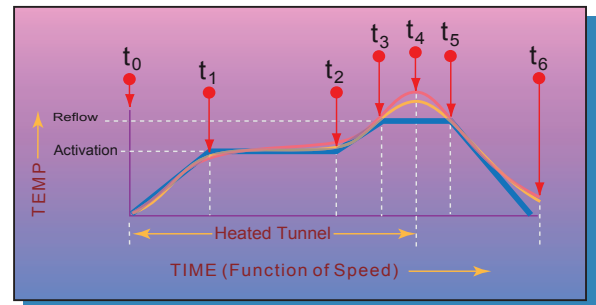
Models 1800-HT



Models 2000-HT



MACHINE SPECIFICATIONS	Models GF-120-HT	Models 1800-HT	Models 2000-HT
Emitter Technology	Horizontal Convection™	Horizontal Convection™	Horizontal Convection™
Heat Tunnel Length	41" (1042mm)	50" (1270mm)	72" (1829mm)
Standard Heating Zones	3 Top, 3 Bottom	4 Top, 4 Bottom	6 Top, 6 Bottom
Cooling Fans	2	2	4
Electrical Power***	220 VAC, 50/60 Hz 1Ø, 50A	220 VAC, 50/60 Hz 3Ø, 70A	220 VAC, 50/60 Hz 3Ø, 100A
Peak Power	8.7 kW	23.2 kW	34.8 kW
Maximum Temperature	HT: 400° C (752° F)	HT: 400° C (752° F)	HT: 400° C (752° F)
Maximum Board Width	12" (300mm)	18" (457mm)	20" (508mm)
Maximum Board Height†	1.375" (35mm)†	1.375" (35mm)†	1.375" (35mm)†
Height of Conveyor	37.5" ± 1/2" (940mm)	37.5" ± 1/2" (940mm)	37.5" ± 1/2" (940mm)
Venting Requirements	Two 4" (102mm) Dia. Flanges 200 CFM (340m³/h) each	Two 4" (102mm) Dia. Flanges 250 CFM (425m³/h) each	Three 4" (102mm) Dia. Flanges 200 CFM (340m³/h) each
Cooling Zone Venting	NA	4" Dia. Flange, 0-400 CFM (680m³/h)	4" Dia. Flange, 0-400 CFM (680m³/h)
Approx. Shipping Weight	600 lbs (272 kg)	1050 lbs (476 kg)	1650 lbs (748 kg)



- Theoretical Reflow Profile
- Typical Profile for Model 1200 (3 Vertical Heating Zones)
- Typical Reflow Profile for Model 2000 (7 Vertical Heating Zones)
- t₀-t₁ PREHEAT
- t₁-t₂ ACTIVATION
- t₂-t₃ RAMP
- t₃-t₄ REFLOW
- t₄-t₆ COOLING
- t₃-t₅ LIQUIDOUS

*All DDM Novastar reflow ovens are covered under patent 6,936,793

**Add 4 inches to each end for edge conveyor

***Other electrical configurations available

†Up to 4" (102 mm) special application tunnel height

ESS310 & ESS500 Selective Solder Machines

Your Economic Solution for:

Prototyping

Product Development

Short Run, High-Mix

Manufacturing Applications

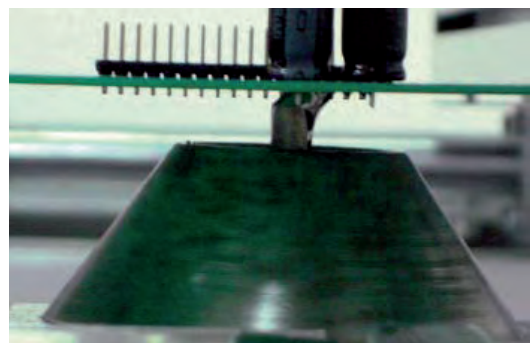
*Convert your hand soldering to automated selective soldering with an ESS
Achieve greater throughput, accuracy, and reliability...*



- Through-hole soldering flexibility - single point, drag, mini-wave, or dip soldering
- Exceptional accuracy and repeatability, with near “zero defect” solder joint yields
- Programming control and flexibility with on-board touch screen and off-line software
- Ease of operation, less handling, small footprint & durable construction

System Benefits & Features

- Precise, accurate, reliable soldering of through-hole components in mixed boards with previously soldered SMT components
- Reduce board processing time as compared with hand soldering
- Reduce direct labor costs, decrease rework costs, increase consistency over hand soldering through-hole components
- One, all inclusive system - Flux, Preheat, and Solder
- Touch screen interface for easy on instrument setup, programming and parameter control
- Instrument programming flexibility and control over preheat, temperature, soldering dwell times, location, direction, and more...
- Off-line programming with photoscan and Gerber import software for convenient machine setup
- Variety of Nozzles available for flexibility - Wettable and Specialty Nozzles*
- Lead-free compatible



PRODUCT SPECIFICATIONS:

Specifications	ESS-310	ESS-500
Max. PCB Size	310 x 310mm (12" x 12")	500 x 500mm (19.7" x 19.7")
Max. Clearance on Solder Side*	25mm (1")*	25mm (1")*
Max. Transport Speed	6m/min	6m/min
Transport Angle	0° fixed	0° fixed
Position accuracy above fluxer, preheater, and solder nozzle	± 0.1mm (± 0.004")	± 0.1mm (± 0.004")
Precision Spray Fluxer Module		
Flux Tank	2L Stainless Steel & Fittings, including Flux Level Monitoring	2L Stainless Steel & Fittings, including Flux Level Monitoring
Flux Speed Max.	6m/min	6m/min
Spray Width (Nozzle diameter 0.3mm)	3mm - 6mm (0.12" - 0.24")	3mm - 6mm (0.12" - 0.24")
Preheat Module		
100% IR Preheat	900W	1200W
Solder Module		
Nozzles	Wettable, Special	Wettable, Special
Smallest Nozzle Diameter	4.0mm on Wettable Nozzles	4.0mm on Wettable Nozzles
Min. Neighbor Component Clearance*	1.5 - 3mm (0.06" - 0.12") depending on nozzle type*	1.5 - 3mm (0.06" - 0.12") depending on nozzle type*
Solder Capacity	Approx. 15kg (33 lbs.)	Approx. 15kg (33 lbs.)
Max. Temperature	400°C (725°F)	400°C (725°F)
Warm-up Time	Approx. 45 minutes	Approx. 45 minutes
Nitrogen Technology		
N ₂ Supply (bottles, tank, or generator suitable, supplied by user)	N ₂ -covering over solder bath & pump unit	N ₂ -covering over solder bath & pump unit
N ₂ Pressure	2 bar (30 psi)	2bar (30 psi)
N ₂ Consumption	0.8 - 1.7 CFM (23 - 49 litres/min) dependent on nozzle and nozzle shroud	0.8 - 1.7 CFM (23 - 49 litres/min) dependent on nozzle and nozzle shroud
Air		
Pressure	5.5 bar (80 psi)	5.5 bar (80 psi)
Electrical Data		
Power	220 VAC, 1Ø, 15A	220 VAC, 1Ø, 16A
Max. Power Consumption	2.5kW	3.0kW
Max. Fuse Rate	15A	16A
Exhaust		
Exhaust Power (supplied by customer)	150 m³/hour	150 m³/hour
Exhaust Duct	100mm (4") in dia.	100mm (4") in dia.
Dimensions		
Size Dimensions	1240mm L x 1050mm W x 1400mm H (48.8" x 41.3" x 55.1")	1440mm L x 1250mm W x 1400mm H (56.7" x 49.2" x 55.1")
Weight	354kg (780 lbs.)	403kg (887 lbs.)

* Consult factory on PCB Layout

Leasing Options Available...

For more information, phone us at 610-337-3050 or email us at info@ddmnovastar.com



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Phone: 610-337-3050 • Fax: 610-337-3054 • www.ddmnovastar.com • info@ddmnovastar.com

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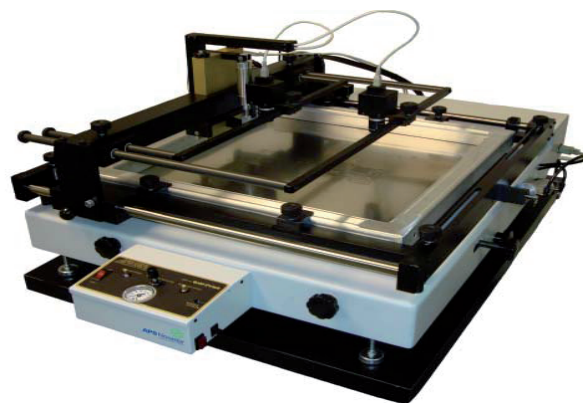
SPR-45VA *SMTrue™ Vision Assist* Stencil Printer

Your Economical Solution for:

Prototyping

Short to Medium Run, High Mix
Production Environments

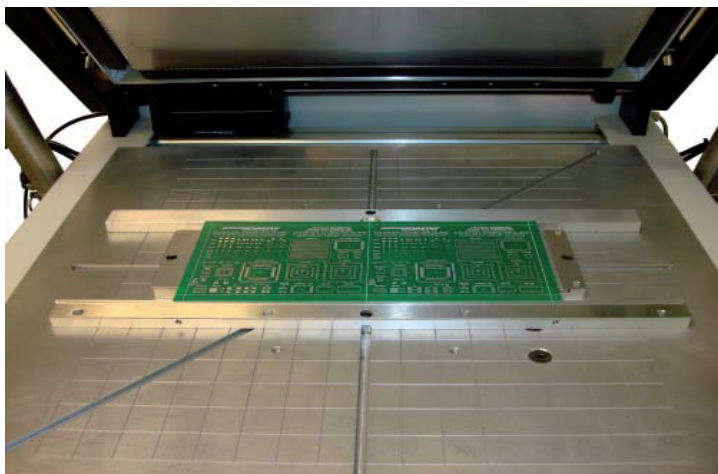
Printing for Ultra-fine QFPs, MicroBGAs,
and CSPs



- High Magnification - 10X *SMTrue Vision Assist* for precise alignment of components down to 12 mil pitch
- Ultra fast, convenient, single and double-sided PCB loading and unloading
- Accurate stencil to board alignment the first time...every time
- Repeatable fine X, Y, Z, and Theta positional adjustments

System Features

- *SMTrue Vision Assist* 10X magnification, axial alignment of stencil to board down to 12 mil ultra fine pitch, single or dual camera, software, communication cabling, and computer
- Pneumatic adjustable power sweep squeegee for printing with single or dual stroke
- Power frame lift for higher volume production
- Fine X, Y, and Theta adjustments for exact, repeatable stencil to board print alignment
- Single Z-axis self leveling adjustment
- Quick change spring loaded double sided PCB nesting kit
- PCB vacuum hold down (optional)
- Adjustable frame holder compatible with all tubular or cast 23" x 23" framed stencils
- Adjustable, reproducible angle-of-attack squeegee adjustments
- Dual squeegee holder (urethane or metal) with independent print force adjustment for clean, convenient applications of solder paste.

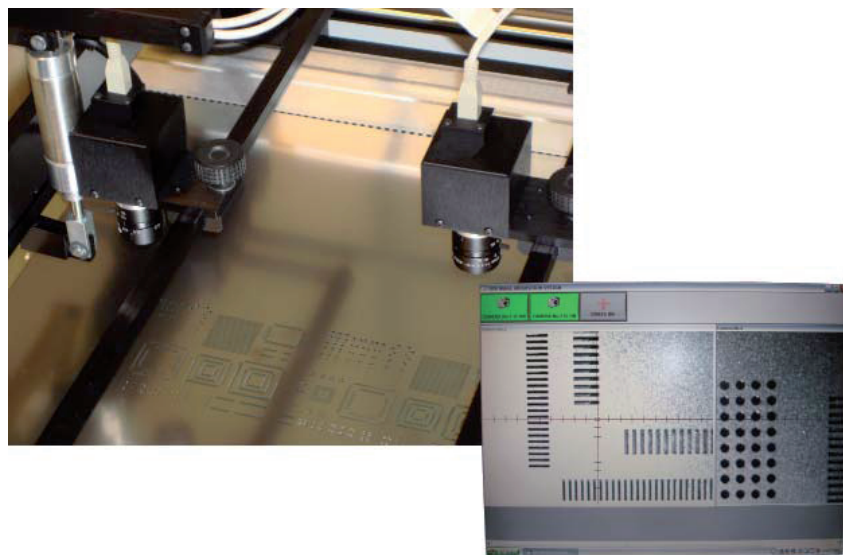


SPR-45VA Double Nesting Kit (optional) is spring loaded for quick board changes and enables stenciling of single and double sided PCB boards.

PRODUCT SPECIFICATIONS:

Printing Resolution	Down to 12 mil pitch components
Dual Squeegee	Yes
Urethane or Metal Squeegee	machine supplied with 2 of each type squeegee
Single or double pass	Yes
Linear squeegee guide	Automatic
Adjustable angle of attack	Yes
Adjustable squeegee pressure	Pneumatic
Adjustable squeegee speed	Pneumatic
Maximum print area	16" x 18" (406mm x 457mm)
Compatible stencil frame size	up to 23" x 23" (584mm x 584mm)
Foil Frame compatibility	Yes
Automatic power frame lift	Yes

X & Y adjustment	$\pm 0.5000"$ (12.7mm)
Z axis adjustment	0 to 5/8" (16mm) single knob, self-leveling
Theta adjustment	Single knob to ± 5 degrees
Clear Lexan® fixture for initial registration	Yes (X, Y, and Theta)
Nesting kits for single and double sided PCBs	Quick exchange, spring loaded
Vacuum hold down option	Yes
Outside frame dimensions	23" x 23" (584mm x 584mm)
Air Pressure	80 psi (5 bar)
System Dimensions (H x W x D)	16" x 30" x 35" (406mm x 762mm x 889mm)
Height with stand option	47" (1194mm)
Approximate Weight	160 lbs (68kg)
Power	120 VAC, 50/60Hz, 2Amp (220-240 VAC available)



Dual cameras provide axial vision alignment of the PCB board to the stencil for precise delivery of solder paste.



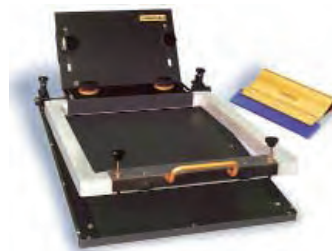
*Leasing Options Available...
For more information, phone us at 1-610-337-3050
or email us at info@ddmnovastar.com*



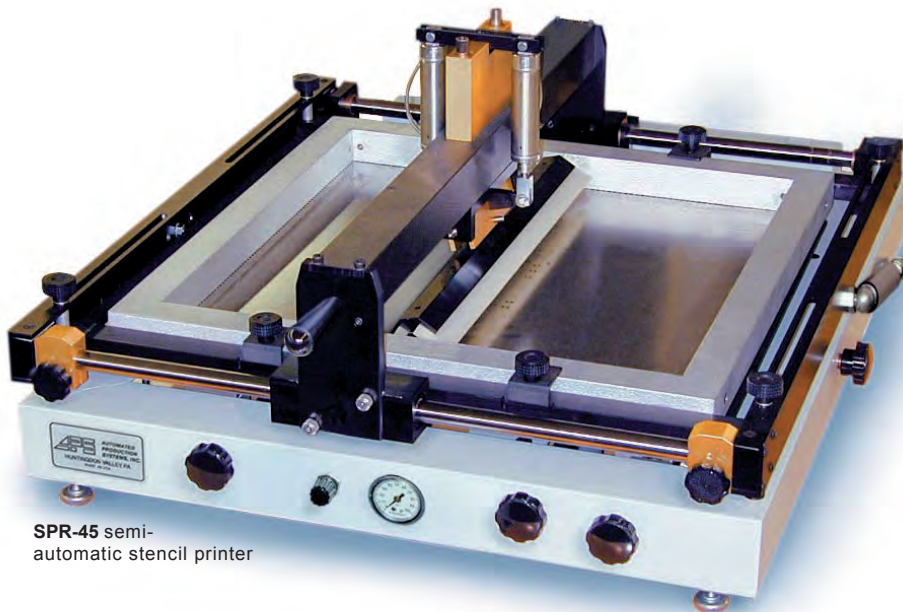
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Phone: 610-337-3050 • Fax: 610-337-3054 • www.ddmnovastar.com • info@ddmnovastar.com



SPR-45 automatic stencil printer
with stand option



SPR-10 manual
stencil printer



SPR-45 semi-
automatic stencil printer

The **DDM Novastar Stencil Printers** range from manual to semi-automatic to automatic.

DDM Novastar Stencil/Screen Printers are designed for low to medium volume assembly runs. Precise X,Y, Z, and theta axis controls allow for accurate, consistent deposition of solder paste or masking material for SMT. These durable, easy-to-use systems provide repeatable and reliable results. A unique "Foil-Frame" adapter kit is available for all models to mount frameless stencils (foils). This option greatly reduces stencil costs.

Features

- Rugged welded steel frame is precision engineered for fine-pitch electronics
- Fine X, Y, Z and Ø adjustments for exact stencil-to-board alignment
- Quick, easy stencil changeover for short setup times
- Squeegee holder accepts polyurethane or metal blades
- Clear Lexan® fixture provides quick and easy print alignment and set-ups
- Foil-frame option for mounting frameless stencils



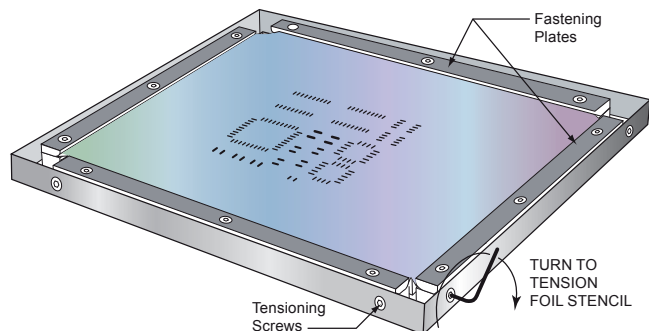
SPR-10

The SPR-10 is a cost effective manual stencil printer with a quick and easy registration method. The operator simply holds the frame on opposite edges, manually aligns the stencil openings to the board land patterns, locks the frame, and applies solder paste. The model SPR-10 uses the same tubular and foil frames as the SPR-20 printer.

- Unique alignment registration system
- Lowest cost APS manual stencil printer

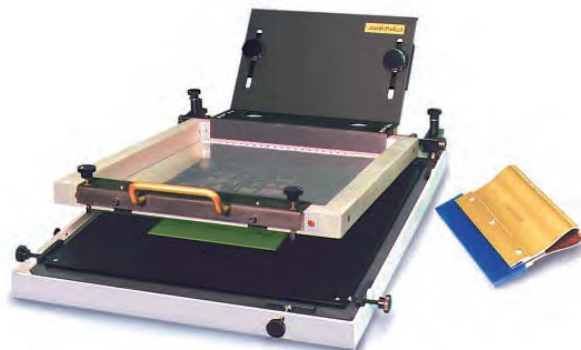
Unique “Foil-Frame” option

An adapter frame kit is available for mounting frameless stencils (foils) on all DDM stencil printers. This option greatly reduces stencil costs because the stencil manufacturer need not supply a new frame with each stencil.



Nesting kit for double sided printed circuit boards

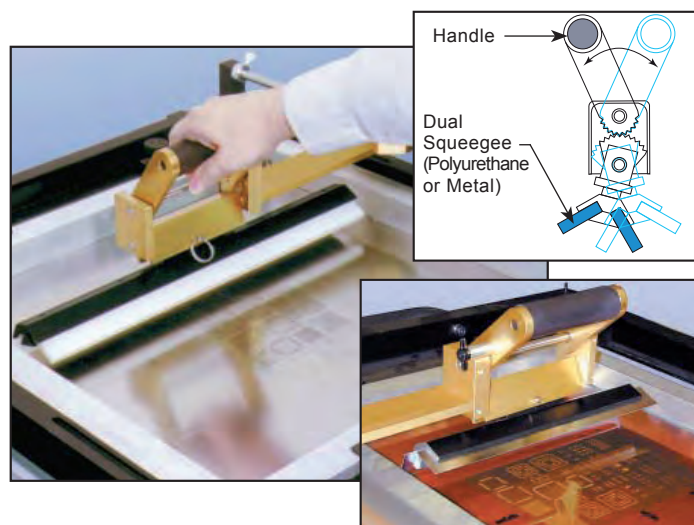
for all DDM Stencil Printers, includes assorted magnetic edge rails and magnetic plate which attaches to the base plate. (SPR-10 & 25 need no magnetic plate)



SPR-20

The SPR-20 benchtop, manual stencil printer is designed for low to medium volume assembly runs. Precise X,Y, Z, and theta axis controls allow for accurate, consistent deposition of solder paste or masking material for SMT. This durable, easy-to-use system provides repeatable and reliable results.

- True theta adjustment (from exact center point) to enhance alignment ease
- Independent 4 point Z axis leveling
- Complete printing kit provides polyurethane squeegee & holder, one tubular frame, and Lexan® fixture for easy registration set-up



Unique dual squeegee

The model SPR-25 dual blade squeegee with guide rail automatically switches when manually sliding it from back to front, or from front to back. (metal squeegee option: photo inset)

Automatic & Manual Stencil Printers for Low to Medium Volume SMT Production



SPR-25

The SPR-25 benchtop, manual stencil printer is designed for low to medium volume surface mount assembly runs. Fine X, Y, Z, and theta adjustments for exact stencil-to-board alignment result in precise, fine pitch printing of solder paste.

- Dual squeegee for clean and convenient application of solder paste
- Linear ball bearing guide assures smooth squeegee stroke with its unique adjustable angle-of-attack for precise single or dual direction printing
- Fine X, Y, Z and \emptyset adjustments for exact stencil-to-board alignment
- Adjustable frame holder compatible with any tubular or cast framed stencils up to 23" x 23" outside diameter
- Easy lift frame with gas strut assists
- Squeegee accepts polyurethane or metal blades
- PCB vacuum hold-down option



SPR-25 with stand option



SPR-40 & SPR-45

Model SPR-40 is a semi-automatic stencil printer designed for medium volume surface mount assembly. The dual squeegee with individual pressure control makes solder paste deposition accurate and repeatable.

Model SPR-45 has the same features as the SPR-40, but is more automated with its power sweep squeegee and power frame lift for higher volume runs. Even for fine pitch applications, friendly precision controls make operation of these systems simple and easy.

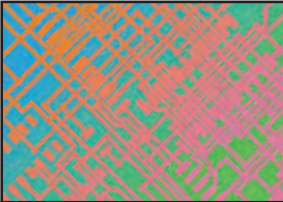

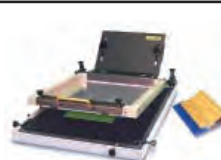





SPR-45 automatic printer with stand option

- Fullest featured APS stencil printers (see specs on back)
- Adjustable speed power sweep squeegee for single or dual passes (SPR-45 only)
- Fine X, Y, Z and \emptyset adjustments for exact stencil-to-board alignment
- Single knob Z axis self leveling adjustment
- Nesting kit option (DNK) for easy handling of double sided boards

Automatic & Manual Stencil Printers for Low to Medium Volume SMT Production

FEATURES AND SPECIFICATIONS

	 manual	 manual	 manual	 semi-automatic	 automatic
Model:	SPR-10	SPR-20	SPR-25	SPR-40	SPR-45
Linear squeegee guide	no	no	yes	yes	automatic
Adjustable power sweep squeegee for single or dual passes	no	no	manual	yes	
Dual squeegee adjustable angle of attack	no manual	no manual	yes yes	yes no	yes no
Adjustable dual squeegee pressure/speed	manual	manual	manual	pneumatic/manual	pneumatic/ pneumatic
Automatic power frame lift	no	no	manual	manual	yes
X & Y adjustment	± 0.500" (12.7mm)	± 0.500" (12.7mm)	± 0.500" (12.7mm)	± 0.500" (12.7mm)	± 0.500" (12.7mm)
Z axis adjustment	0 to 3/4" (19mm) (4 point leveling)	0 to 3/4" (19mm) (4 point leveling)	0 to 5/8" (16mm) single knob, self leveling	0 to 5/8" (16mm) single knob, self leveling	0 to 5/8" (16mm) single knob, self leveling
Theta adjustment	(manual alignment)	Single knob with true Ø, ± 3° range	Counter rotating dual knobs, ± 5° range	Counter rotating dual knobs, ± 5° range	Counter rotating dual knobs, ± 5° range
Adjusts to various size frames	yes	yes	Frame holder accepts any size stencil frame up to 23" x 23"	Frame holder accepts any size stencil frame up to 23" x 23"	Frame holder accepts any size stencil frame up to 23" x 23"
Clear Lexan® fixture for initial registration	no	yes (for Y and Ø)	yes (for X, Y and Ø)	yes (for X, Y and Ø)	yes (for X, Y and Ø)
Unique "foil-frame" option	yes, models FF-10/20	yes, models FF-10/20	yes, model FF-25	yes, models FF-40/45	yes, models FF-40/45
Nesting kit option for double sided PCBs	yes	yes	yes	yes	yes
Vacuum hold-down option	no	no	yes	yes	yes
Metal squeegee option	yes	yes	yes	yes	yes
Maximum print area	12" x 15" 305 x 380mm	12" x 15" 305 x 380mm	16" x 18" 406 x 457mm	16" x 18" 406 x 457mm	16" x 18" 406 x 457mm
Outside frame dimensions	20" x 17" 508 x 432mm	20" x 17" 508 x 432mm	23" x 23" 584 x 584mm	23" x 23" 584 x 584mm	23" x 23" 584 x 584mm
Approximate weight	35 lbs (13.6 kg)	50 lbs (22.7 kg)	117 lbs (53.1 kg)	150 lbs (68 kg)	160 lbs (73 kg)
Power*	NA	NA	NA	NA	110* VAC, 50/60 Hz, 2 A
Air pressure	NA	NA	NA	80 psi (5 bar)	80 psi (5 bar)
Weight with stand option	NA	NA	164 lbs (74.3 kg)	197 lbs (89.4 kg)	207 lbs (93.9 kg)
Overall dimensions	17.5"W x 27"L x 11"H 445 x 686 x 280mm	21"W x 28"L x 11"H 533 x 711 x 280mm	28"W x 33"L x 14"H 711 x 838 x 355mm	28.5"W x 33"L x 14"H 724 x 838 x 355mm	30"W x 35"L x 16"H 762 x 900 x 406mm
Height with stand option	NA	NA	45" (1143mm)	47" (1194mm)	47" (1194mm)

*220/240 VAC available

EWS-310 Wave Soldering Machine

Your Economic Solution for:

Prototyping

Product Development

Short Run, High-Mix

Manufacturing Applications



- Quickly load and unload PCBs with finger conveyor
- Continuously adjustable PCB width from 1 to 12 inches
- User friendly touch screen LCD for programming and parameter adjustment
- Streamline design for Easy Maintenance and Cleaning

System Features

- Finger conveyor for pallet-less operation
- Visibility throughout entire process with clear viewing Plexiglass® hoods
- Onload and offload conveyor extensions
- Durable, rugged welded steel frame construction
- Fully dry wave, no oil intermix required
- Stainless steel solder pump impellers with external ball bearings
- Laminar wave for through hole component soldering
- Motorized conveyor width adjustment
- Fluxer and air knife pressure regulators
- Solder level sensor alarm
- Solder drain with stainless steel valve
- On-board profiler
- Lead-free solder capable



Dual Wave Option shown above - turbulent wave for SMD (optional) and laminar wave for through-hole soldering.



Recirculating finger cleaner option with spray spout and brushes



Solder level sensor with alarm

PRODUCT SPECIFICATIONS:

PCB Width	30 to 300mm (1 to 12")
Board Handling	Fingers
Maximum Wave Height	0 to 10mm (0 to 3/8")
Solder Pot Capacity	single wave - 90kgs (200 lbs.) dual wave - 170kgs (375 lbs.)
Max. Leaded Solder Pot Temperature	300°C (572°F)
Max. Lead-free Solder Pot Temperature	350°C (662°F)
Quick Change Lead to Lead-free Solder System	Yes
Approximate Warm-up Time (for leaded solder)	60 minutes
Max. Conveyor Speed	2.5 m/min (98.4"/min)
Soldering Angle	6 degrees
Foam Fluxer Tank	3 liters (0.8 gal.)
Compressed Air	Max 30 psi on system with air knife

Max. Preheat Temperature 1	150°C (302°F)
Preheat 1 Power	4.8 kW
Max. Preheat Temperature 2	200°C (392°F)
Preheat 2 Power	2.0kW
Preheat Length	870mm (34.25")
Preheat Method	IR + Convection
Solder Pot Power Capacity	single wave - 3.6 kW dual wave - 5.2 kW
Machine Operating System	Color graphic LCD with touch screen
Power	220V, 3 phase, 60Hz
Power Consumption	single wave - 11 kW dual wave - 12.2 kW
Warranty	1 year
Machine Dimensions	2500 x 1100 x 1550mm (98.43" x 43.31" x 61.02")

Options

- Optional turbulent wave for SMD applications
- Optional quick change lead-free/lead solder pot trolley system
- Finger Cleaner
- Spray fluxer
- Nitrogen inerting with GasMizer™ feature



Motorized roll-out pot provides easy access.



Finger conveyor for pallet or pallet-less operation.



Independently controlled infrared and forced air convection preheaters compatible with VOC-free fluxes.

Leasing Options Available...

**For more information, phone us at +1-610-337-3050
or email us at info@ddmnovastar.com**

The Spartan Series 8S, 8D, 12S, and 12D

Your Economic Solution for Easy Start-Up of PCB Production

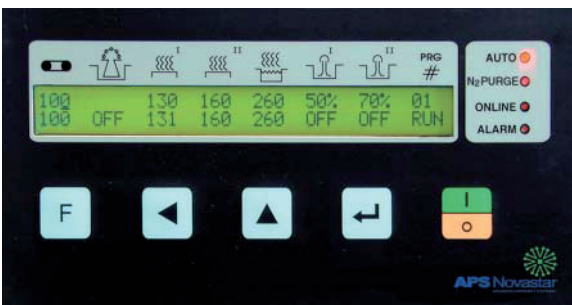
- Decrease Labor Costs by Significantly Reducing Hand Soldering
- User Friendly Programming and Operation
- Small, Space Saving Footprint
- Durable Construction

Standard Features:

- Single or dual wave
- Stainless steel foam fluxer
- Computer control includes:
 - 10 menu storage
 - RS-232 serial interface
 - SPC online or offline data logging
 - Fault monitoring & reporting
 - Low solder indicator
- On board air compressor
- Dual preheaters with heat tunnel and forced air convection
- Wave and flux interval sensors
- Status light tower
- Slide-out fluxer with drip tray
- Compatible with VOC free fluxes
- Full one year warranty



**LEAD FREE
Soldering Capable**



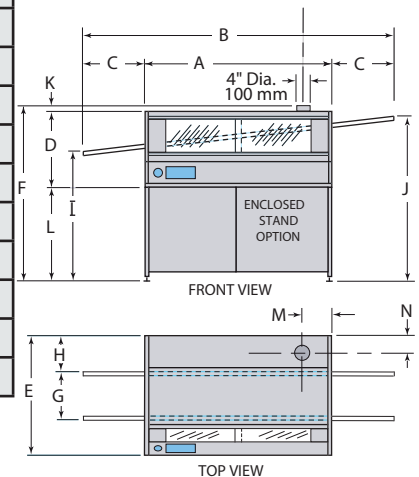
Computer Control

Options:

- Enclosed Stand
- Flux Air-Knife
- Additional Pallets
- Extra-Long Pallets
- Nitrogen Inerting

PRODUCT SPECIFICATIONS:

SPECIFICATIONS	8S-HT (single wave)	8D-HT (dual wave)	12S-HT (single wave)	12D-HT (dual wave)
Power	220 VAC, 60 Hz 1Ø, 30A	220 VAC, 60 Hz 1Ø, 40A	220 VAC, 60 Hz 1Ø, 50A	220 VAC, 60 Hz 3Ø, 20A
Foam Fluxer Tank	0.5gal/2ltrs	0.5gal/2ltrs		
Solder Pot Capacity	125 lbs/57 kgs	125 lbs/90 kgs	250 lbs/114 kgs	375 lbs/170 kgs
Max. Wave Height	0-3/8"/0-10mm	0-3/8"/0-10mm	0-3/8"/0-10mm	0-3/8"/0-10mm
Wave Width	8"/203mm	8"/203mm	11.8"/300mm	11.8"/300mm
Max. Preheat Temp.	300°F/150°C	300°F/150°C	300°F/150°C	300°F/150°C
Preheat 1 Power	2.25 kW	2.25 kW	4.0 kW	4.0 kW
Preheat 2 Power	1.5 kW	1.5 kW	2.0 kW	2.0 kW
Max. Solder Pot Temp.	575°F/300°C	575°F/300°C	575°F/300°C	575°F/300°C
Lead Free Pot Temp.	662°F/350°C	662°F/350°C	662°F/350°C	662°F/350°C
Solder Pot Power	2.5 kW	3.2 kW	3.6 kW	7.2 kW
Approx. Warm-up Time	40 min.	40 min.	50 min.	50 min.
Max. Conveyor Speed	6 ft/min (2m/min)	6 ft/min (2m/min)	6 ft/min (2m/min)	6 ft/min (2m/min)
Pallet	STD: 8" x 11.4" 200 x 290mm	STD: 8" x 11.4" 200 x 290mm	STD: 12" x 15.8" 300 x 400mm	STD: 12" x 15.8" 300 x 400mm
Dim. (in/mm) A	66.5/1690	66.5/1690	79/2007	79/2007
B	96.5/2451	96.5/2451	118/2997	118/2997
C	14/355.6	14/355.6	19.5/495.3	19.5/495.3
D	20/508.0	20/508.0	24/609.6	24/609.6
E	31/787.4	31/787.4	39/990.6	39/990.6
F	50/1270.0	50/1270.0	54/1371.6	54/1371.6
G	11.5/292.1	11.5/292.1	16.5/419.1	16.5/419.1
H	8.8/223.5	8.8/223.5	10.8/274.3	10.8/274.3
I	33/838	33/838	33/838	33/838
J	45/1143	45/1143	46/1169	46/1169
K	2/50.8	2/50.8	2/50.8	2/50.8
L	28/711.2	28/711.2	28/711.2	28/711.2
M	14/356	14/356	15/381	15/381
N	4.5/114	4.5/114	5/127	5/127
Venting Requirement	300 CFM/500 m3/h max., 4" /100 mm Dia. Flange			



Leasing Options Available...

**For more information, phone us at +1-610-337-3050
or email us at info@ddmnovastar.com**

165 Boro Line Road • King of Prussia, PA 19406 • USA
Phone: 610-337-3050 • Fax: 610-337-3054 • www.ddmnovastar.com • info@ddmnovastar.com

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PP004_200903

Models with 14", 18" and 24" Wave Widths

*Exceptional value, proven performance,
and flexible configurations
to meet all your wave soldering needs*

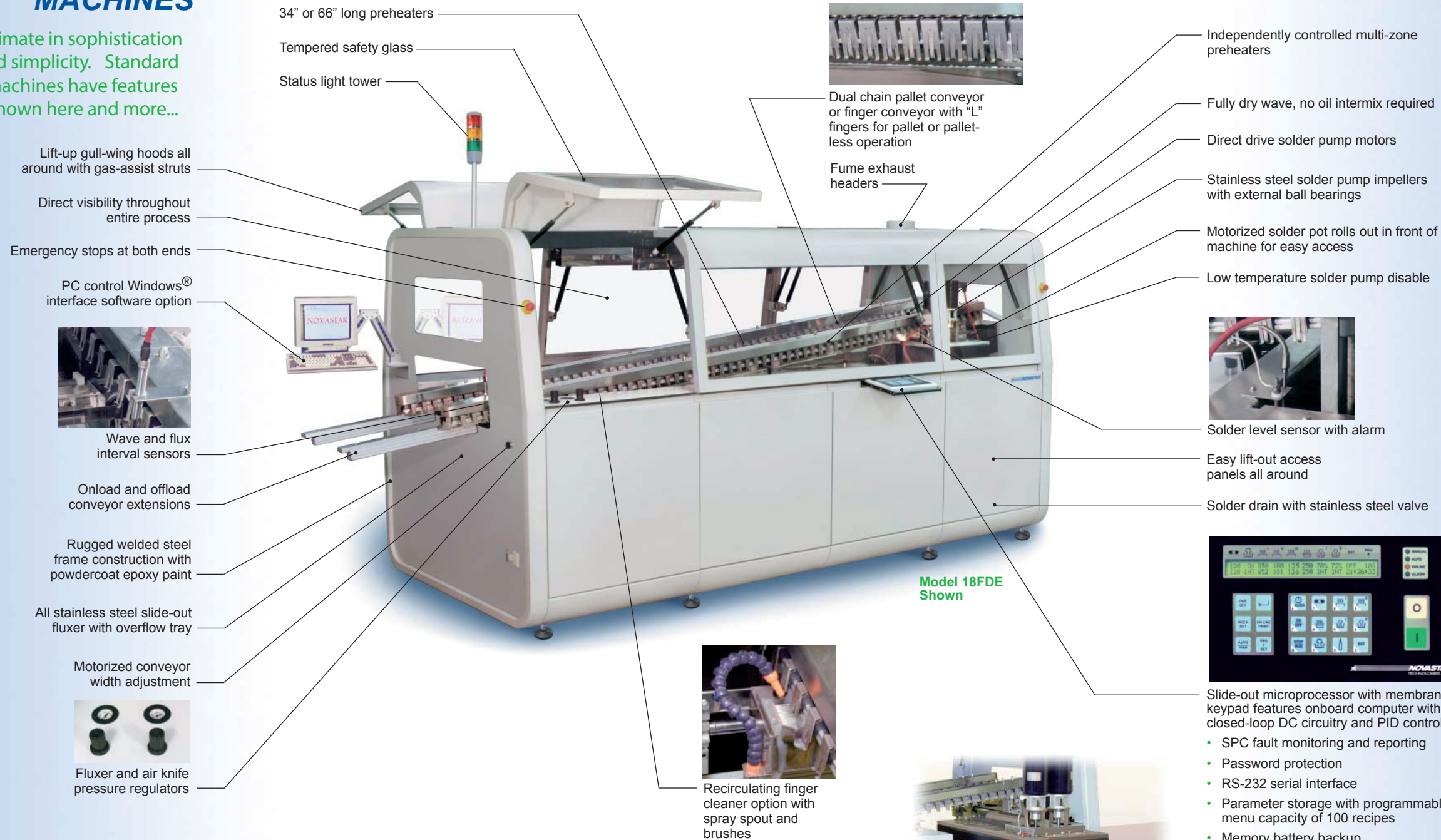
- Streamlined Design for Easy Maintenance and Cleaning
- User Friendly Programming and Operation
- Exceptional accuracy and repeatability
- Durable Construction



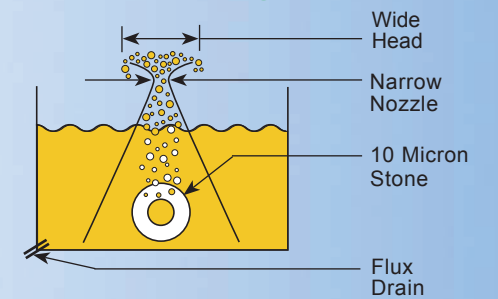
**LEAD-FREE
Soldering Capable**

14", 18" and 24" WAVE SOLDER MACHINES

The ultimate in sophistication and simplicity. Standard machines have features shown here and more...

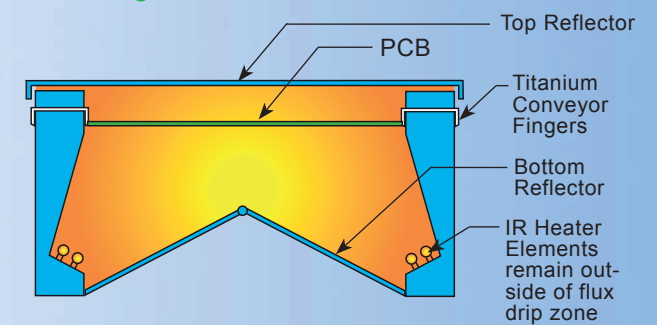


Fluxer Configuration

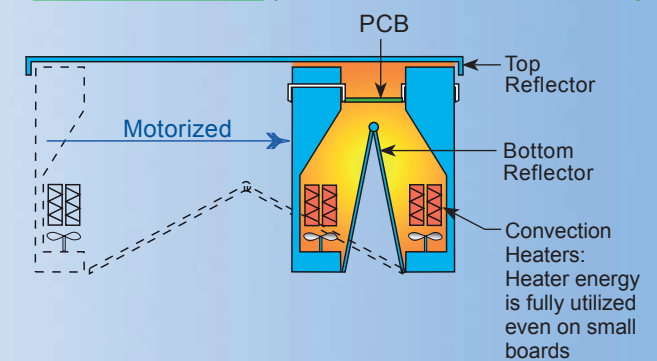


Preheater Configuration

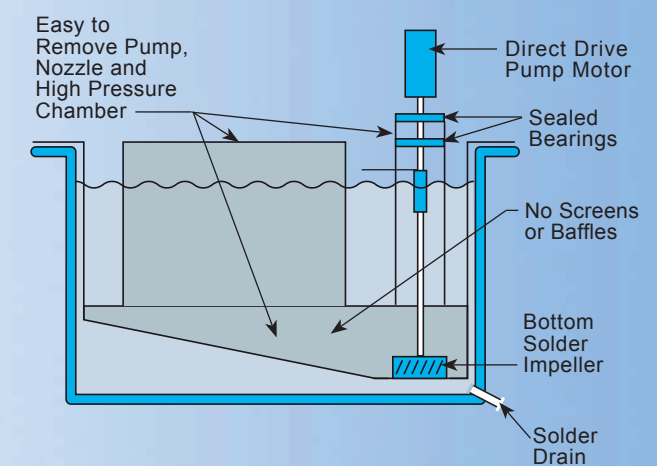
For Large Boards (shown with IR elements)



For Small Boards (shown with convection elements)



Solder Module Configuration



Flux nozzle with air knife

Independently controlled infrared and forced air convection preheaters compatible with VOC-free fluxes

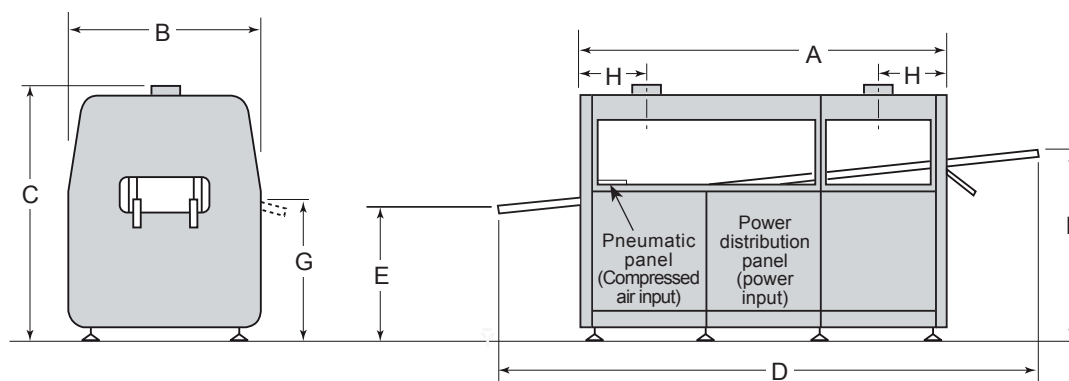
Turbulent wave for SMD and laminar wave for through-hole soldering

Motorized roll-out pot provides easy access. Pot rolls to front of machine: requires less floor space.

OPTIONS

- Lead Free Soldering Capable
- Finger cleaner
- Spray fluxer
- Nitrogen inerting with GasMizer™ feature
- PC interface Windows™ software
- Special applications & requests
- Full finger option

Wave Solder Machines for Lead-Free Soldering



DIMENSIONS & SPECIFICATIONS (ENGLISH/METRIC)

MODEL	14PD/FD/PS/FS-HT	18PD/FD/PS/FS-HT	24PD/FD/PS/FS-HT
A: Footprint length	95/2413	95/2413	95/2413
B: Width (in/mm)	55/1397	55/1397	61/1550
C: Height (in/mm)	63/1600	63/1600	63/1600
D: Overall length (in/mm)	F: 127, P: 151 F: 3226, P: 3835	F: 127, P: 151 F: 3226, P: 3835	F: 127, P: 151 F: 3226, P: 3835
E: Onload height	33.5/850	33.5/850	33.5/850
F: Offload height (in/mm)	F: 46.5, P: 51.5 F: 1181, P: 1308	F: 46.5, P: 51.5 F: 1181, P: 1308	F: 46.5, P: 51.5 F: 1181, P: 1308
G: Controller height	39/990	39/990	39/990
H: Header from end	18/457	18/457	18/457
Power*	220 VAC, 60 Hz 3Ø, 30A	220 VAC, 60 Hz 3Ø, 50A	220 VAC, 60 Hz 3Ø, 50A
Foam Fluxer Tank	1 gal/4 ltrs	1.5 gal/6 ltrs	2 gal/8 ltrs
Solder Pot Capacity	500 lbs/225 kgs	1000 lbs/450 kgs	1325 lbs/600 kgs
Max Wave Height	0-3/8"/0-10 mm	0-3/8"/0-10 mm	0-3/8"/0-10 mm
Wave Width	14"/350 mm	18"/460 mm	24"/600 mm
Minimum Board Width	2"/50 mm	2"/50 mm	2"/50 mm
Max Preheat Temp	356 °F/180 °C	356 °F/180 °C	356 °F/180 °C
Preheat Power I	4.8 kW	4.8 kW	4.8 kW
Preheat Power II	NA	NA	NA
Preheat Power III	2.0 kW	2.0 kW	2.0 kW
Total Preheat Power	6.8 kW	6.8 kW	6.8 kW
Max Solder Pot Temp	575 °F/300 °C	575 °F/300 °C	575 °F/300 °C
Max Lead Free Pot Temp	662 °F/350 °C	662 °F/350 °C	662 °F/350 °C
Solder Pot Power	4.5 kW	7.5 kW	9.5 kW
Approx Warm-up Time	100 minutes	120 minutes	150 minutes
Max Conveyor Speed	8 ft/min (2.5 m/min)	8 ft/min (2.5 m/min)	8 ft/min (2.5 m/min)
Compressed Air	10 CFM @ 60 PSI (17 m ³ /hr @ 4 bar)		
Exhaust requirements	Two 6" dia. headers @ 300 CFM each (600 CFM total) Two 150 mm dia. headers @ 500 m ³ /hr each (1000 m ³ /hr total)		
Conveyor	6 degree incline, left to right operation, front fixed rail - rear moveable rail (motorized)		

P= pallet conveyor, F= finger conveyor, S= single wave, D= dual wave

*Other electrical configurations available; contact factory for details