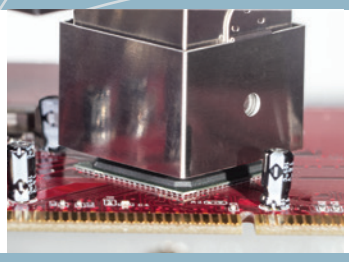
TF**1800** and TF**2800**

BGA Rework Systems



Solutions and systems for soldering, rework and repair of electronics

PACE®
paceworldwide.com
MADE IN THE USA

A family-owned company since 1958

Introducing the TF**1800** and TF**2800** BGA Rework Systems.

paceworldwide.com

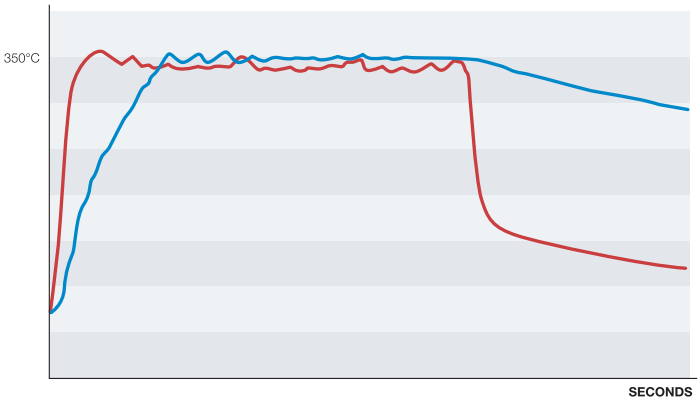
Patented Inductive-Convection Heating Technology

- **Ultimate Process Control**
- **Advanced Thermal Performance**
- **Unsurpassed Productivity**
- **Outstanding Energy Efficiency**

Conventional resistance coil heating technology has been successfully used in convective rework stations for decades to install and remove a variety of BGA and SMD components. However, today's extremely high thermal mass boards, ultra-fine pitch components and challenging production rework environments demand greater process control, thermal performance and faster throughput than ever before.

Enter PACE's TF Series of BGA/SMD Rework Systems...With its groundbreaking, patented Inductive-Convection Heating Technology, the TF Series top-side heater reaches the target temperature in just seconds for safe, rapid solder joint reflow in virtually any component installation or removal application.

Top-Side Heater: Fast Heat Up—Rapid Cool Down



PACE's Inductive-Convection Heater easily outperforms competitive heaters which utilize standard forced air convection technology, achieving target temperature instantaneously, about 4x faster than competitive heaters. Unlike conventional heaters, the TF Series immediately drops to temperatures well below solder melt when the heater is de-energized.

Inductive-Convection Heater pre-heats the air in a cyclonic fashion around the induction coil before it enters the inner chamber.

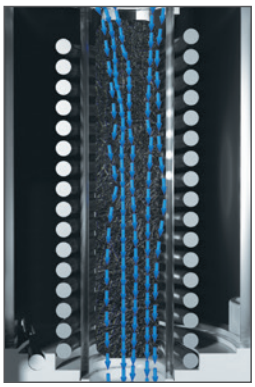
Cross Section of Heater: After entering the inner chamber, the pre-heated air is instantly heated to target temperature.

How It Works

The TF Series Inductive-Convection Heating Technology provides ultimate thermal performance by its ability to instantly heat up and cool down the temperature of the air it delivers to the work. The air is first pre-heated in the outer chamber as it moves in a cyclonic fashion around the induction coil before it enters the inner chamber. It's then heated to target temperature through a highly efficient heat transfer process in an energized induction field. During active cooling, the induction coil is de-energized. The heater's unique low thermal mass design further enhances the system's ability to heat up and cool down quickly and gives the operator an unsurpassed level of process control in developing thermal profiles for the particular rework task at hand.

Active Cooling Yields High Quality Solder Joints

After solder joint reflow is complete, the TF Series delivers fast, controlled, active cooling of the component and PCB directly through the nozzle, eliminating the risk of excessive intermetallic growth and yielding the highest quality solder joints.



Cross Section of Heater: Low thermal mass Inductive-Convection Heater allows air to instantly cool down below solder melt temperatures.

Powerful, Energy Efficient Performance

The TF Series Inductive-Convection Heating Technology delivers all the power you need to tackle the most challenging high thermal mass PCBs available today. Yet, its highly-efficient design does it with just a fraction of the power required by yesterday's conventional heating technology.

LEAD FREE SOLDER COMPATIBLE

TF1800
for Standard Sized PCB's

Revolutionary Inductive-Convection Heater
Patented low thermal mass heater provides quick response heat-up and cooldown, resulting in faster throughput, requiring far less power to operate.

Active Cooling provides Rapid Solder Cooldown
Inductive-Convection heater offers swift yet controlled component/PCB cooling, directly *through the nozzle*, yielding the highest quality lead-free joints.

4 Thermocouple Inputs
Ensures accurate/precise profile development and provides real-time process validation.

High-Definition Vision Overlay System with Quad-Field Imaging
The automatically controlled, retractable optical alignment system features a 1080p Hi-Def camera, simultaneous viewing of PCB pads/component balls (via beam-splitting dichroic prism), shadow-free LED lighting, up to 240x zoom capability and Quad-Field Image technology (comes standard) for finest pitch or very large components.

Ultra-Precise Placement Capability
Motorized reflow head is driven by an advanced stepper motor system which provides smooth, high precision, repeatable movement with no drift, allowing for soft landing of components and 28µm (.0011") placement accuracy.

Single Axis Operation
All operations, including component pick-up, alignment, placement, reflow & active cooling are completed in a single axis, eliminating the risk of component movement after placement and reflow.

Advanced, User-Friendly Software
4th generation software guides operators through an intuitive interface that virtually automates the process—so advanced that creating profiles has never been easier!

Board Support Wand
Adjusts easily and prevents warping of PCB during reflow.

Bottom-Side Preheater Adjustable Height
Medium/long wave quartz IR heating elements respond faster with 1000 W of power. The preheater height is adjustable from standard position up to 38mm (1.5") closer to the PCB for the most challenging high thermal mass boards.

Precision Board Holder
PCB Holder features fine micrometer adjustments for the most delicate X and Y alignment (theta control on reflow head). Extruded Board Holder Arms with T-Slots and movable clamps offer support for even the most irregularly shaped boards with unusual edges.

TF2800
for Extra Large, High Mass PCB's

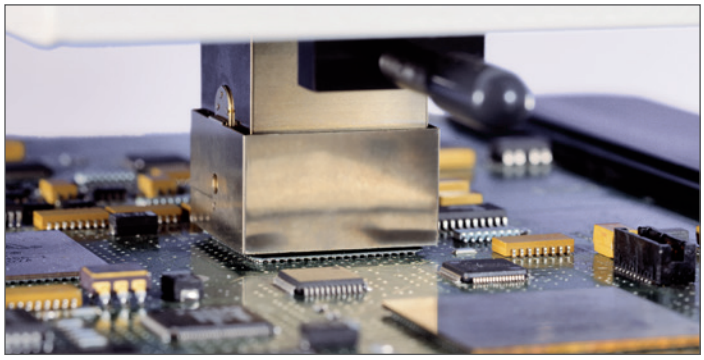
The TF2800 Includes all of the features of the TF1800 plus:

+ **Powerful, Bottom-Side IR Preheater**
A robust 1900 W array incorporates six-150 W auxiliary heaters, which are independently activated via software, in addition to the central 1000 W IR Emitter (also used in the TF1800).

+ **For Largest Boards**
Designed for board handling capability up to 24" x 24" (610mm x 610mm).

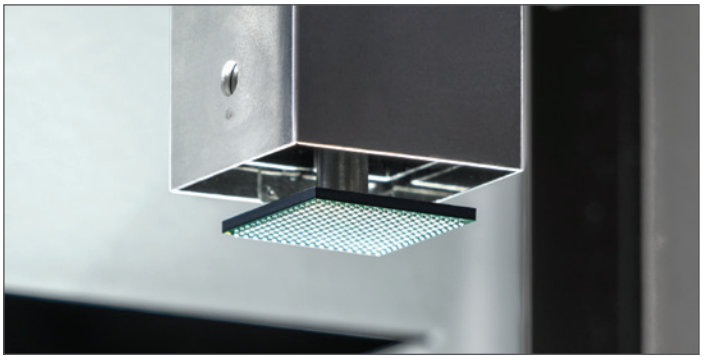
Advanced Features

Ultra-High Precision Placement



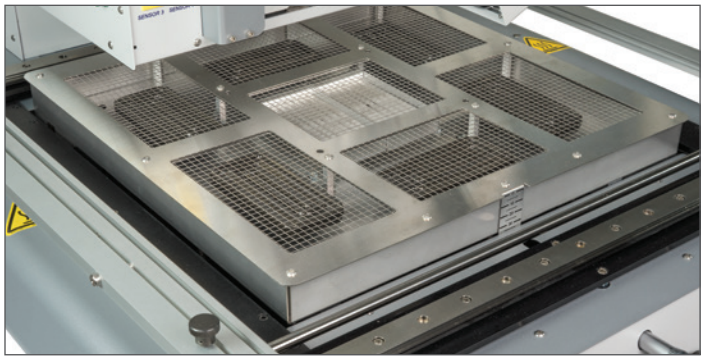
Newly designed reflow head provides smooth, precise movement with no drift, allowing for repeatable and accurate placement.

High Sensitivity Vacuum Pick Assembly



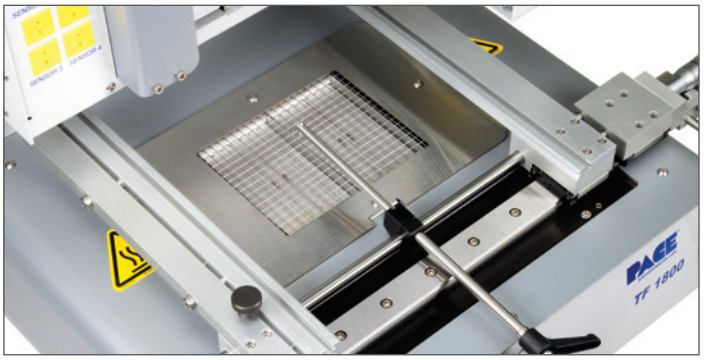
New Vacuum Pick design is more robust, utilizes an optical sensor, is counterweight balanced, and uses precision high temperature linear ball bearings for the highest sensitivity in placement and pick-up.

PACE Exclusive Height Adjustable Preheater



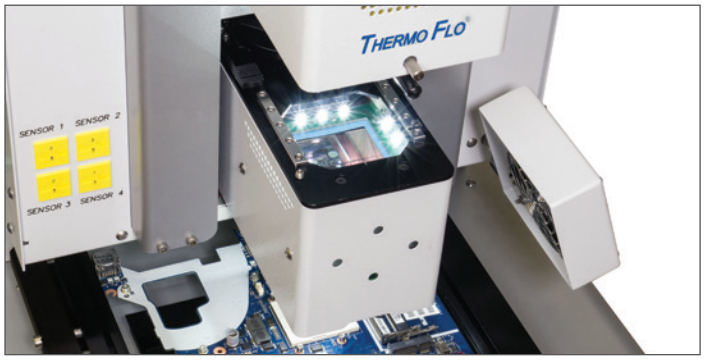
Powerful IR Preheater allows for fast, efficient bottom-side heating and is height adjustable to provide more aggressive thermal transfer on higher mass PCBs (TF2800 shown).

Enhanced Board Support Capability



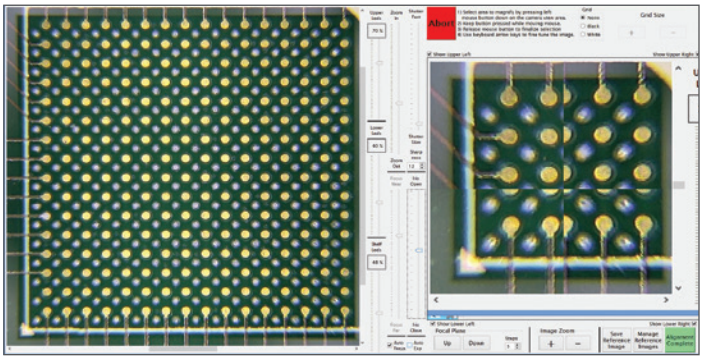
To prevent sagging/warping during reflow, an integrated Board Support Wand is used on the TF1800 (shown above), while the TF2800 includes an innovative Board Support Beam.

High-Definition Optical Alignment System



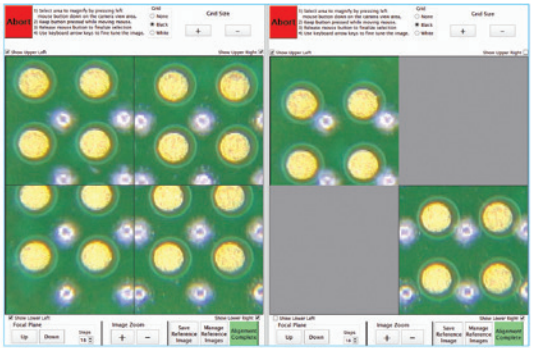
An automated Vision Overlay System uses a dichroic beam-splitting prism, high intensity LEDs, and new high definition 1080p camera to easily align any component.

Crisp & Clear Images for Component Alignment



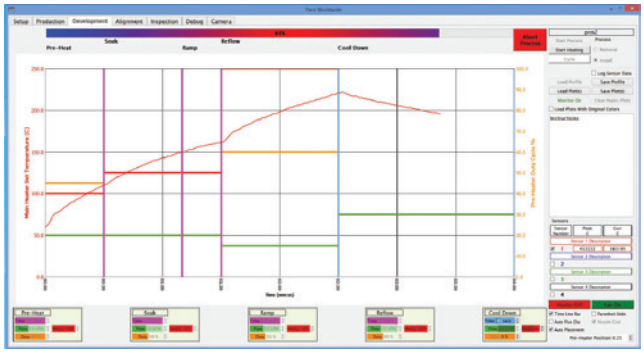
A high definition Vision Overlay System uses bright white LEDs with independent intensity control to provide precise distinction of pads and solder ball or leads.

Quad-Field Imaging for Large/Fine Pitch BGAs



Quad-Field Imaging allows up to *four corners* of a large component (and its pads) to be viewed under high magnification, providing perfect alignment of outsized BGAs or fine-pitch QFPs.

Fourth Generation Software Suite



Newly designed Windows-based software provides a simple graphical interface with intuitive set-up and profiling, on-the-fly profile adjustment, unlimited profile storage and much more.

SYSTEM **SPECIFICATIONS**	TF**1800** (for Standard Sized PCB's)	TF**2800** (for Larger PCB's)
Part #/ Power Requirement for 120 VAC Unit	**Part # 8007-0574 120 VAC, 50/60 Hz (1500 Watts maximum) Requires dedicated 15 A supply**	**Part # 8007-0582 120 VAC, 50/60 Hz (2400 Watts maximum) Requires dedicated 20 A supply**
Part #/ Power Requirement for 230 VAC Unit	**Part # 8007-0575 230 VAC, 50 Hz (1500 Watts maximum) Requires dedicated 10 A supply**	**Part # 8007-0583 230 VAC, 50 Hz (2400 Watts maximum) Requires dedicated 10 A supply**
Dimensions	**737mm (29") H x 686mm (27") W x 737mm (29") D**	**737mm (29") H x 1118mm (44") W x 965mm (38") D**
Weight (Without Computer)	**45kg (100lbs)**	**90kg (200lbs)**
Top-side Heater	Patented Inductive-Convection Heater, 300 Watts	
Bottom-side Preheater with Adjustable Working Height	**Medium/Long wave IR, 1000 Watts; 220mm (8.6") x 155mm (6.1"); Adjustable working height from lowest position up to 38mm (1.5") closer to the PCB**	**Medium/Long wave IR, 1900 Watts with array of 7 IR emitters capable of preheating large, high mass assemblies; Adjustable working height from lowest position up to 38mm (1.5") closer to the PCB**
Active Cooling Capability	Standard, offers swift, yet controlled component/PCB cooling, directly through the nozzle	
High Sensitivity Vacuum Pick	Pick is counterweight balanced, and utilizes an optical sensor and precision high temperature linear ball bearings, ensuring delicate placement and pick up of parts from PCB. Includes seven (7) Vacuum Picks	
Precision Placement Capability	Advanced professional placement system utilizing a stepper motor and position encoding provides smooth, precise movement, with no drift, allowing for repeatable and accurate placement	
Placement Accuracy	Stepper motor with precision positioning of to 28µm (.0011") accuracy	
Board Support Capability	**Integrated Board Support Wand prevents PCBs from sagging/warping during rework and is adjustable to clear parts on bottom of PCB**	**Incorporates adjustable/removable Board Support Beam; plus up to four stationary adjustable height support pins; Prevents PCBs from sagging/warping during rework**
Temperature Setting Range	**Top Heater:** 100˚ to 328˚ C (212˚ - 750˚ F); **Bottom Heater:** 100˚ to 221˚ C (212˚ - 430˚ F)	
Precision PCB Holder	Advanced table features micrometer X & Y adjustment, extruded board holder arms, spring loaded, with T-slots and movable clamps for both large and irregularly shaped boards with non-uniform edges	
Maximum/Minimum PCB Size	**Maximum: 305mm x 305mm (12" x 12"); Minimum: N/A arms close down completely**	**Maximum: 610mm x 610mm (24" x 24"); Minimum: N/A**
Maximum/Minimum Component Size	Maximum: 65mm (2.5") x 65mm (2.5"); Minimum: 1mm Sq.	
Thermocouple Inputs	Four (4) thermocouple inputs insure accurate profile development and real-time monitoring (includes 2 K-type thermocouples)	
High Definition Optical Alignment System	Vision Overlay System (VOS) with High Definition (1080p) color camera, integrated frame grabber, dichroic beam-splitting prism, independently controlled LED illumination for component and PCB. Up to 240x zoom capability, with Stable Zoom and image stabilization. VOS does not require routine calibration. (Optical Alignment Kit included)	
Motorized Optics Housing	Automatically controlled, retractable optics housing protects Vision Overlay System from dirt and contamination	
Quad-Field Imaging	For large component alignment (including fine-pitch QFPs), allows up to four opposite corners of a large component (and its pads) to be viewed under higher magnification	
Single Axis Operation	All operations, including component pick-up, alignment, placement, reflow & active cooling are completed in a single axis, eliminating risk of component movement after placement and reflow	
Auxilliary Cooling Fan	Standard, for secondary cooling of the PCB	
Software	Intuitive, user-friendly, Windows-compatible software guides operators through profile development and execution; No cost upgrades on TF1800 software	
Computer System	Windows 10 PC with wireless mouse/keyboard	
Video Monitor	607mm (24") wide screen flat panel monitor (includes Monitor Arm Mounting Kit)	
Video Inputs	USB 3.0	
Maximum Airflow	Self contained pump, PC controlled, adjustable up to 30 SLPM	
Nitrogen Capability	Nitrogen soldering and cooling ready	
Component Nests	Two (2) removable and adjustable Component Nests provided for perfect centering of components, in preparation for vacuum pick-up/placement. Unique component holding system for parts under 5mm Sq.	
Heat Focusing, Vented Nozzles	Over 90 Nozzles available	
Flux Application Plate	Included; allows for automated flux dipping	
Stencils/Solder Paste Application	Over 145 stencil kits are optionally available (requires Universal Bracket Kit) and are integrated into the installation process	
PV-65 Pik-Vac Vacuum Wand	Included; provides a manual vacuum pick-up capability for handling SMDs, incorporates new 15 minute auto-off feature	
Warranty	One Year Limited Warranty	

Accessories Included

Vacuum Picks

TF Series includes seven (7) Vacuum Picks to accommodate a wide variety of large and small SMDs. Comes with 8 O-rings for irregularly surfaced components. An optional 20 gauge Micro Vacuum Pick is also available.

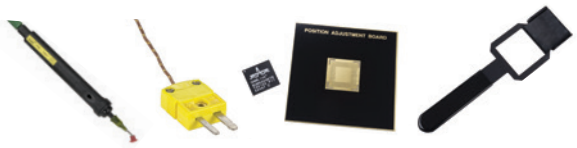
Flux Tray Assembly

Allows for automated flux dipping, gel or paste flux application to the balls of a BGA. There are 2 different depths in the plate for small and large solder spheres.

Adjustable Component Centering Nests

Two removable and adjustable Nests are provided for perfect centering of square and rectangular components, in preparation for vacuum pick-up/placement. In addition, a Small Parts Nest (not shown) is provided for components less than 5mm sq.

Additional Accessories



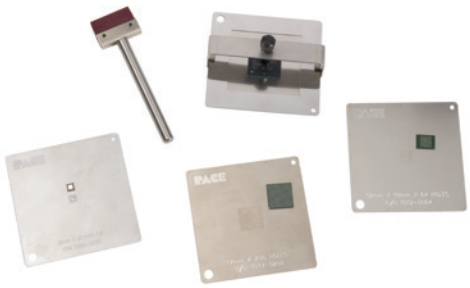
The TF Series comes complete with many additional accessories including: PV-65 Pik-Vac Component Handling Vacuum Wand, Optical Alignment Kit, 2 K-Type Thermocouples, Hot Nozzle/Chip Handling Tool, Nozzle Change Pad, Hex Key Set, 24" Monitor Mounting Arm Kit and more!

Optionally Available

Heat Focusing Nozzles

Over 90 standard nozzles, from 1mm Sq-75mm Sq, are available for BGA, CSP, QFP, SO, QFN and other components. Custom designs can be created to meet specific rework requirements.

Stencils & Stencil Bracket Kit



Over 145 standard stencils are available. Both the Universal Stencil Bracket Kit, shown top right with squeegee (stencil shown with bracket not included), and a stencil are required to apply solder paste to the component.

Arm-Evac 150 Digital Fume Extractor with SteadyFlex™ Arm

The Arm-Evac® 150 captures hazardous fumes locally and is suitable for benchtop soldering and electronic rework applications. The low-cost system comes complete with self-supporting SteadyFlex ESD-Safe Arm/Nozzle assembly, Wireless Remote and 3-stage filtration system … everything you need to set up one operator!

MBT350 Multi-Channel Rework System

PACE's MBT350 is a self contained, 3 channel station that offers high capacity, low temperature SMT/Thru-Hole soldering, desoldering and repair. The unit is excellent for extracting excess solder on BGA/SMD pads after component removal, and comes with SX-100 Sodr-X-Tractor Handpiece, TD-100A Tip-Heater-Cartridge Iron and MT-100 MiniTweez Thermal Tweezer.

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