

ThermaFlo 10N

Fan Forced Convection SMT Solder Reflow System

ThermaFlo 10N is a fan forced nitrogen or air atmosphere convection oven designed for SMT reflow or curing. **ThermaFlo 10N** uses our exclusive ConstantClean™ technique to continuously clean convection air jets in the oven. Research International's patented convection flow circulation pattern automatically purges flux from the heater cavity – eliminating cleaning maintenance. CoolClean™ reusable flux condensation plates are removable in minutes from the nitrogen liquid cooling section.

The innovative **ThermaFlo 10N** design provides convection heat transfer using fewer fans than other ovens in its class. The result is improved heat transfer and reflow process repeatability.

Standard System Features

- Flux-Free Heater Cavity with ConstantClean™ Technology
- Nitrogen Liquid Cooling with CoolClean™ Flux Condensation Plates
- 122-inch (310 cm) Heated Length; 7 Vertical Heat Zones
- Wire Belt Conveyor
- Computer Controlled Air/Nitrogen Changeover
- Pentium™-Compatible Computer and SVGA Color Monitor with Computer Arm
- Multi-Language StarWin™ Oven Operating Software (32 bit - Windows 95™)
- Power Clamshell
- Remote Communications Package
- Upper and Lower Product Exhaust
- Final Product Fan Cooling

Safety and Quality Features

- Common European (CE) Safety Certification
- 3 Color Signal Light Tower
- Redundant Overtemperature Protection
- Emergency Stop Buttons (4)

Options (Customized Features Also Available)

- **Edge Conveyor** – Width adjustable from 2-18 inches (5-46 cm); component clearance 1¼ inch (3 cm) below and 1 inch (2.5 cm) above board.
- **Battery Back-Up** – In the event of a power failure, conveyor runs for 10-20 minutes to exit the boards from the oven.
- **SMEMA Interface** – Link to upstream and downstream machines to communicate line readiness. Includes board count sensor.
- **Board Fall Detection** – Indicates proper edge conveyor board transport.
- **Manual Underboard Support** – Full-length support with manual location positioning.
- **StarLog™ SPC Software** – Graphing display program for all critical reflow process parameters.
- **Direct Couple Exhaust** – Allows direct facilities exhaust connection to the oven.
- **Custom Panel Color** – Customer specified to match assembly line.
- **Computerized Conveyor Width Adjust** – Software controlled motorized edge conveyor width adjustment.
- **Motorized Conveyor Width Adjust** – Switch activated motor driven rail width adjustment.
- **Oxygen Analyzer** – Monitors PPM levels.

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| | ThermaFlo 10N |
| | 244 Inches (620 cm) |
| | 43 Inches (109 cm) |

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| Overall Height | 64 Inches (162 cm) |
| On-Load Length | 18 Inches (46 cm) |
| Off-Load Length | 18 Inches (46 cm) |
| Net Weight | 4000 Pounds (1814 kg) |
| Shipping Weight | 4400 Pounds (1996 kg) |
| Crate Dimensions (L x W x H) | 250 x 50 x 70 Inches (635 x 127 x 178 cm) |
| Power Requirements and Safety Standards | |
| Voltage | 480VAC, 50/60 Hz [standard]; 220VAC, 380-415VAC and other voltages available [optional] |
| Maximum Startup Current | 55.0 kVa |
| Typical Operating Current | 14.0 kVa |
| Primary Fuses | 80 Amps |
| Lockable Safety Disconnect | Standard |
| 3 Color Light Tower | Red=Alarm/Yellow=Not Ready/Green=Ready (top to bottom) |
| Industrial Dimension Controller | CPU card, 3 analog I/O cards, oven interface board |
| SMEMA Transport Communications | Connectors entrance & exit end meets std. spec., entrance sensor indicates product presence |
| Electric Clamshell Lift | Switch Activated; Opens heater cavity 12 Inches (30 cm) < 60 seconds |
| CE Certification | Standard |
| Redundant Overtemperature Protection | Temperature monitoring separate from controller to prevent any machine damage |
| Oven Interface | |
| Interface Computer | Compaq™ 133 MHz Pentium™ (min) Processor, 8 meg RAM, 1.2 gig hard drive, Windows 95™, 3.5" floppy drive, serial port |
| StarWin™ Interface Software | 32 bit, true Windows 95™ interface package |
| Modem Communications | 28.8 modem (minimum) that allows remote control of oven |
| StarLog™ SPC Software | SPC application to track and record all critical reflow parameters |
| Thermal Process Chamber Performance | |
| Heat Transfer Method | Fan Forced Convection; Nitrogen or Air Atmosphere |
| Heated Length | 122 Inches (310 cm) |
| Independent Temperature Control Zones | 7 closed loop top zones and 7 closed loop bottom zones |
| Edge Conveyor Heat Control | 2 zones – one per rail |
| Maximum Setpoint Temperature | 275°C |
| Mass Loading Rates | 0% to 90% |
| Inert Atmosphere | |
| Oxygen PPM Range | Typically 50-200 PPM above source |
| Nitrogen Consumption | Typically <1500 SCFH (42 cubic meters/hour) |
| Nitrogen Monitoring Ports | Reflow section; Oxygen analyzer [optional] |
| Exhaust Specifications | |
| Entrance Exhaust Output | ~ 300 cubic feet/minute (9 cubic meters/minute) |
| Exit Exhaust Output | ~ 200 cubic feet/minute (6 cubic meters/minute) |
| Witches hat indirect connection on each | Standard; Direct Couple Exhaust [optional] |
| Exhaust above and below conveyor | Standard |
| Conveyor Specifications – Lifetime Warranty | |
| Conveyor Type | Stainless steel wire belt [standard]. Optional stainless steel roller chain on patented tensioned stainless steel rail. Tension keeps rail straight as heat causes rail expansion. |
| Edge Conveyor Pin Length | 0.17 Inches (0.43 cm) Standard |
| Conveyor Speed Range | 10 – 100 Inches/minute (25 – 250 cm/min) |
| Conveyor Speed Accuracy | ±0.5% to setpoint |
| Conveyor Parallelism | ±0.020 Inches (±0.05 cm) |
| Product Flow Direction | Left-to-Right [standard] or Right-to-Left [optional]; Front or Rear Rail Fixed |
| Conveyor Height Above Floor | 34¼ – 37 3/8 Inches (87 cm – 95 cm); SMEMA Standard |
| Usable Conveyor Width | 18 Inches (46 cm) |
| Usable Conveyor Width with Edge Conveyor | Adjustable 2 – 18 Inches (5 – 46 cm), optional motorized or computerized width control |
| Product Clearance Above Conveyor | 1 Inch (2.5 cm) |
| Product Clearance Below Primary Conveyor | 1¼ Inches (32 mm) with installed Edge Conveyor |
| Full-Length Underboard Support System [Optional] | 0.2 Inch (3 mm) board contact width, bead chain support with tensioned rail, manual or computerized/motorized position adjustment, z-height adjustable. |
| Nitrogen Cooling System Specifications | |
| Nitrogen Cooling Section Length | 35 Inches (89 cm) |
| Nitrogen Cooling Method | Closed loop chilled water, above and below board cooling with laminar flow air curtain |
| Internal Cooling Unit Capacity | 12,000 BTU at 20°C (70°F) ambient |
| CoolClean™ Flux Condensation Collectors | Maximum temperature NTE 150°C; Collector plates replaceable < 20 minutes |

