

Forced Convection SMT Solder Reflow System

HVN+155 is a forced convection oven designed for SMT mass reflow and curing processes. Tight atmosphere control provides computerized switching between Air and Nitrogen atmospheres with Oxygen PPM levels below 50 PPM.

Standard System Features

- 157 inch (3988 mm) Heated Length.
- Reflow processing speeds from 32 to 52 inches (.86 to 1.3 m) per minute.
- Highest Ratio of Impingement Flow / Heated length ratio = 94%
- 10 Vertical Heating Zones with Independent Top and Bottom Setpoints.
- 6 Zones of enclosed nitrogen/water cooling, 3 upper and 3 lower.
- Powered Exhaust with direct connections.
- 20 inch (508 mm) wide Wire Belt Conveyor
- Battery backup system for 10 – 20 minutes of continued conveyor operation during a power loss.
- Left to Right Product Flow (Right to Left Optional)
- Pentium Motherboard, CD-Rom Drive and a 3.5 inch floppy disk drive.
- Windows™ operating system and custom Windows™ control software.
- Power Clamshell.
- Machine Mounted Main Disconnect.

Safety and Quality Features

- 3 Color Signal Light Tower (option)
- Emergency Stop Buttons (4)
- Dual Actuator, Two Hand Activated Safety Bonnet Lift with motion alarm.
- Safety Interlock Keys to Access Electrical Panels.
- Redundant over temperature, safety/shutdown.
- Common European (CE) Safety Certification (option)

Options

- **Combination Conveyor Transports** – Rail and Belt combination, Rail and Under-board Support, Multi-Lane Rail Systems.
- **Board Counter and SMEMA Interface** – Link to upstream and downstream machines to communicate line readiness. Includes board count sensor.
- **Blower Speed Control** – 5 Independent Blower Speed Controls for Heat Zones, 20 – 120%.
- **Cable Under-board Support** – Full-length support with manual location positioning.
- **Closed Loop N2 Control** – N2 flow automatically adjusts to maintain purity and conserve N2 costs.
- **Automatic O2 Monitoring** – Monitor 1-5 ports for Oxygen levels.
- **Custom Panel Color** – Customer specified to match assembly line.
- **Computerized Conveyor Width Adjust** – Software controlled motorized edge conveyor width adjustment.
- **High Setpoint Temperatures** – Available with maximum temperatures up to 400 C.
- **Balance Weave Belt** – Flat mesh conveyor belt with close spacing for small PCB, Hybrid or Semiconductor processing.
- **Extra Cooling Module** – Additional zone of air Cooling.

Customized Features Available

- **Customized Machine Lengths** – Machine length designed to meet available space constraints during line re-configuration.
- **Customized On-Load / Off-Load Lengths** – Lengths of On-Load and Off-Load designed for many interfaces.
- **Customized Number of Zones / Heated Lengths** – Heated lengths up to 235”, and number of zones from 1 to 15.



Model	Model HVN+155
Dimensions	
Length x Width x Height	246.5 Inches (626 cm) x 56.1 Inches (142 cm) x 55 Inches (140 cm)
On-Load Length / Off-Load Length	12 Inches (30 cm) / 12 Inches (30 cm)
Net Weight	4500 Pounds (2041 kg)
Shipping Weight	5400 Pounds (2450 kg)
Crate Dimensions (L x W x H)	258 x 65 x 72 Inches (655 x 165 x 182 cm)
Thermal Process Chamber Performance	
Heat Transfer Method	High Volume, High Velocity Forced Convection, Nitrogen or Air Atmosphere's
Heated Length	156 Inches (396 cm), Highest Ratio of Impingement flow / Heated length ratio = 94%
20 Temperature Control Zones	10 closed loop zones Top / 10 closed loop zones Bottom
Temperature Setpoint Offsets	Level 3 Password Access to temperature offsets in the oven configuration file allows multiple ovens To be exactly thermally matched so one recipe can be used worldwide.
Maximum Setpoint Temperature	300 °C Standard, (higher temps up to 400 °C optional)
Mass Loading Rates	0% to 90%
Nitrogen Cooling System Specifications	
Nitrogen Cooling Section Length / Number of Zones	47 Inches of cooling (120 cm), 3 Zones upper, 3 zones lower.
Nitrogen Cooling Method	Closed-loop, integrated water cooler, nitrogen or air-cooling.
Final Extended Fan Cooling (optional)	9" (23cm) positioned above exit conveyor impinging 75 ft ³ /min (2.1 m ³ /min) of ambient air-cooling.
Flux Management	
Cooling Flux Condensation Collectors	Cooling condensation collector with high surface area filter traps flux migrating from reflow zones through cooling. Changes in less than 10 minutes.
Cooling Recirculation Flux Collectors	Cooling intake filters remove remaining fluxes prior to recirculation fans. Changes in less than 20 minutes.
Exhaust Flux Condensation Collectors	Exhaust ductwork inside machine cools exhaust and flux condenses prior to factory exhaust.
Oven Interface	
Interface Computer	Pentium/Windows™ based interface control with industrial integrated controller cards for reliable Closed-loop temperature and conveyor control.
Password Protection	4 levels of password protection: Operator, Engineering, Maintenance, and Factory Configuration.
Product Temperature Profiling	Real-time product profiling and report generation for up to 4 thermocouples.
Recipe Storage	Unlimited recipe/profile storage.
Machine diagnostics	Power-use monitoring, historical temperature charts, alarm logs, etc.
3 Color Light Tower	Red = Alarm/Yellow = Not Ready/Green = Ready (top to bottom)
SMEMA Transport Communications	Connectors entrance & exit end meets SMEMA std., entrance sensor indicates product presence.
Inert Atmosphere & Monitoring	
Oxygen PPM Range	Typically < 50 PPM above source.
Nitrogen Consumption	Typically < 1000 SCFH (470 lpm)
Nitrogen Monitoring Ports	Zone 1, Zone 4, Zone 10, Cooling, Source
Atmosphere Monitoring (Optional)	Machine mounted analyzer with independent setpoints and software feedback for up to 5 monitoring ports.
Power Requirements and Safety Standards	
Voltage	480VAC, 400 VAC, 220 VAC, (± 10%) – 3 Phase – 50-60 Hz
Maximum / Typical Startup Current	95 kVa / 24kVa
"Green" Energy Save Feature	Adjustable "Sequential-zone" startup for reduced power consumption.
Primary Fuse Protection	Circuit Breakers
Lockable Safety Disconnect/ Breaker	Standard
Uninterrupted Power Supply	During a factory power fail, battery backup safely conveys work in process at a controlled speed to exit end to prevent damage to product.
Dual Electric Clamshell Lift	Two-button safe activation, with motion alarm. Oven opens a full 16" (41 cm) for easy access to heating and cooling. Blowers and heaters are automatically shut off when bonnet is open for minimal noise and heat load on factory. Cooling is lifted with the heater cavity for permanent seals.
Safety Electrical Access	Special key required to access electronics inside the machine is standard.
Redundant Over-temperature Protection	Temperature monitoring separate from controller to prevent any machine damage
CE Certification	Optional
Exhaust Specifications	
Powered Exhaust Flow	Blowers inside the machine draw and exhaust proper flow. Machine Operation is stable despite Atmospheric changes outside the building.
Entrance / Exit Exhaust Outputs	~ 75 cubic feet/minute each (2.25 m ³ /minute) Factory fixed ductwork direct connects to 4" (100mm) diameter (76mm). (Flexible ductwork not required, directed vertically, or vertically down.)
Conveyor Specifications	
Wire Belt Conveyor	Stainless steel wire belt [standard], 20 inches (51cm) wide, 0.50-inch (13mm) pitch. 24 inch (61 cm) wide optional.
Edge Conveyor (option)	Extruded beam conveyor, long-life reversible rails. Pin Length 0.20 Inches (0.50 cm) Standard
Multi-lane Conveyor Options	3 rail and 4 rail Dual lane conveyor options, easily configured to meet custom conveyor interfaces.
Conveyor Speed Range	1 – 100 Inches/minute (25 – 2.5 m/min)
Product Flow Direction	Left-to-Right [standard] or Right-to-Left [optional]; Front or Rear Rail Fixed
Conveyor Height Above Floor	34 – 38 Inches (86 cm – 96.5 cm); SMEMA Standard
Usable Conveyor Width with Edge Conveyor	Adjustable 4 –18 Inches (46 cm) maximum standard, Smaller and Greater board widths available
Product Clearance Above Rail Conveyor pin	1 Inch (2.5 cm). Greater Clearance available.
Full-Length Under-board Support System [Optional]	0.1 Inch (2.5 mm) board contact width, wire cable support with manual hand crank position adjustment, z-height adjustable.