

Vacuum Reflow Oven VR-1000-N



1. Product Introduction

- JAGUAR in-line vacuum reflow soldering enables automated mass production of soldering and reduces production costs;
- Built-in high-efficiency vacuum module, using the original German imported Asahi 100B vacuum module! Stable and reliable! Rapid and high efficiency, rapid pressure reduction of 8 seconds up to 100Mbar, 13 seconds up to 50Mbar or less, corresponding to the limit vacuum up to 1Mbar; unique control of the vacuum extraction software and hardware control mode, software can be divided into 4 sections of the extraction vacuum and electric valve control valve opening and closing degrees to control the pumping speed to cope with a variety of complex processes made of, the cavity rate is reduced to less than 1%;
- Test welding temperature curve mode can be set directly, convenient for process making adjustment;
- Multi-temperature zone design, independent temperature control, to meet the requirements of different temperature profiles;
- Effectively solve the porosity and cavities appeared after welding; the cavitation rate is controlled below 3%, and the ultimate cavitation rate can be reduced to below 1%;
- Highly efficient vacuum pumping unit for fast pressure reduction;
- Equipped with a three-stage transportation system: heating zone, vacuum unit and cooling section, individually adjustable;
- Efficient production capacity with an average production beat of 40-60 seconds;
- Efficient flux recovery system to prevent rosin residue;
- Vacuum pressure measurements react to values in the furnace chamber and not to vacuum pump values;
- Vacuum as low as 2 mbar effectively reduces the number of voids;
- Three-stage transfer system: heating zone, vacuum zone and cooling zone;
- Furnace chamber automatic lid opening system, easy to clean and maintain the maintenance;
- Equipped with 5 HP water cooler, excellent cooling performance;
- Low maintenance requirements and reduced downtime.

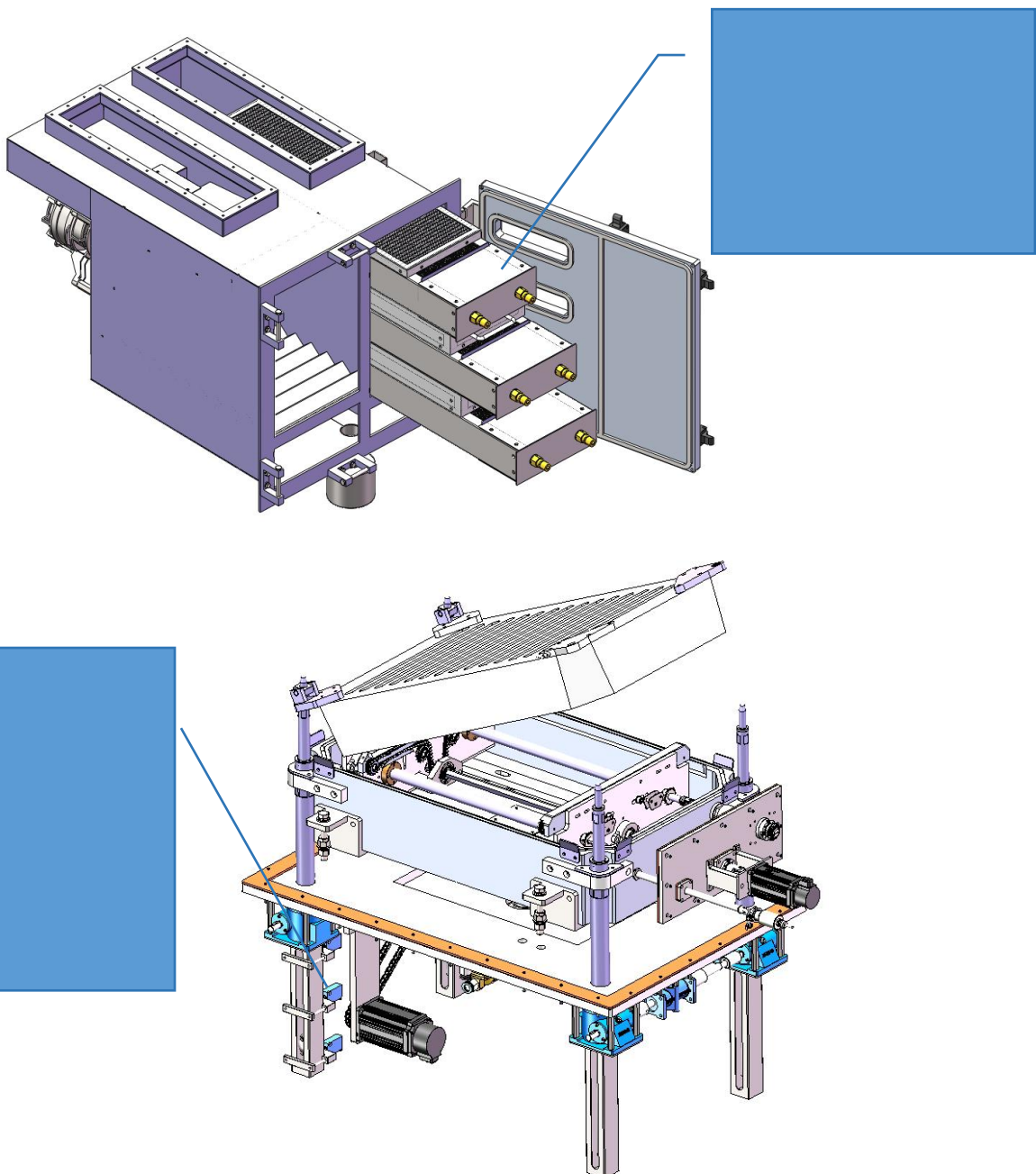
2. Advantageous features

High efficiency and low maintenance

JAGUAR reflow soldering with the vacuum option effectively solves the problems of air holes, voids and gaps that occur after soldering, reducing the void rate to less than 1% at a maximum vacuum pressure of 10mbar-5mbar;

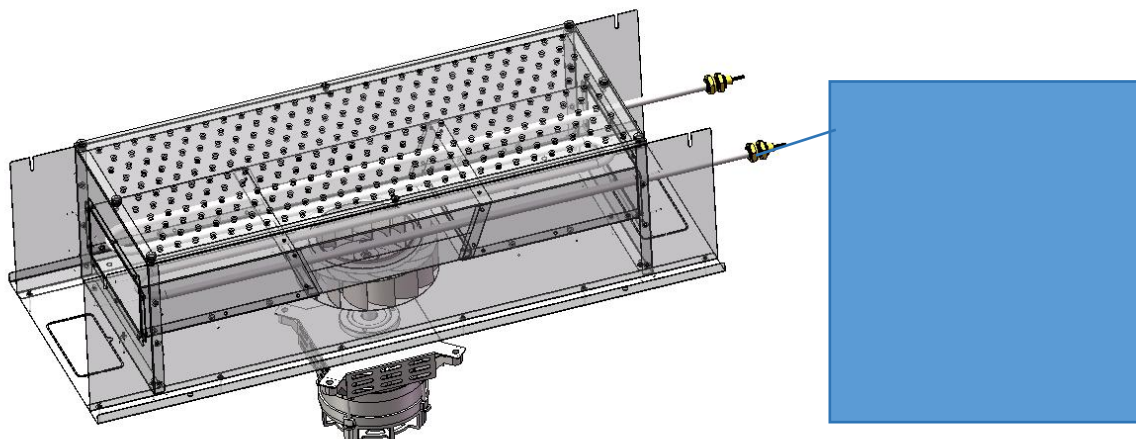
Vacuum pressure and vacuum rate can be set individually and saved as curve parameters. This integrated solution makes the production process more stable and efficient, avoids high void rates that can lead to re-soldering or scrap of PCBs, and reduces production costs.

3 sets of condensers + 3 sets of filters + 1 activated carbon filter to ensure clean nitrogen reuse after filtration, condensers + filters are quick disassembly and installation program, easy maintenance, fast and efficient



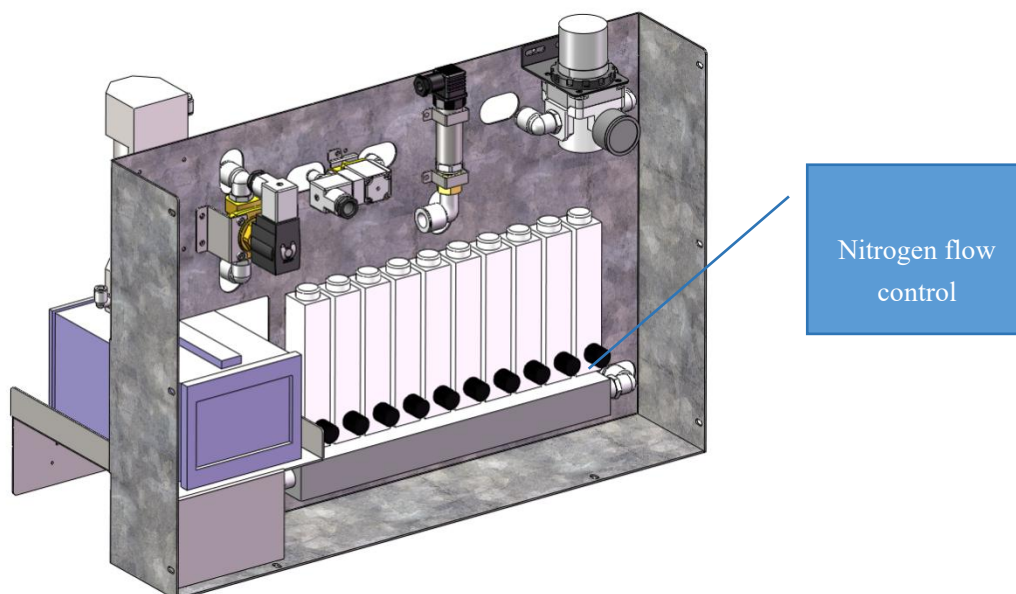
Vacuum area lifting method for Huichuan servo + motor + turbine worm gear lifting, stable and reliable, divided

into 3 points of limit control, the lower limit of the extraction of the vacuum working state, the middle limit of the state of the board into the state and open the cover maintenance state, the upper limit of the maintenance state, respectively, through the software height of the servo pulse positioning control and limit switches control.

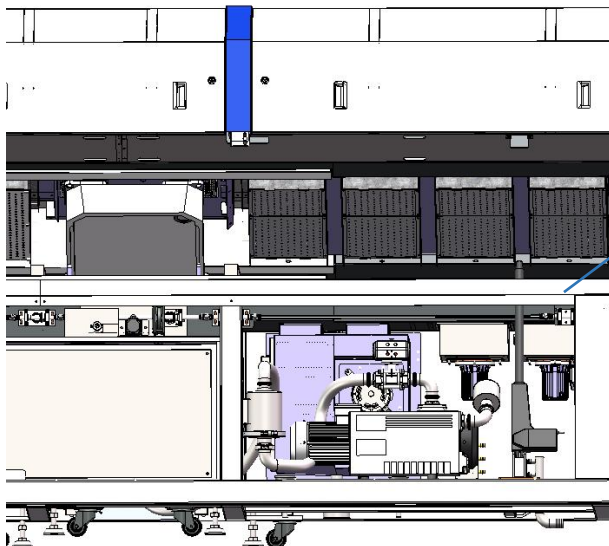


Preheating zone heating mode:

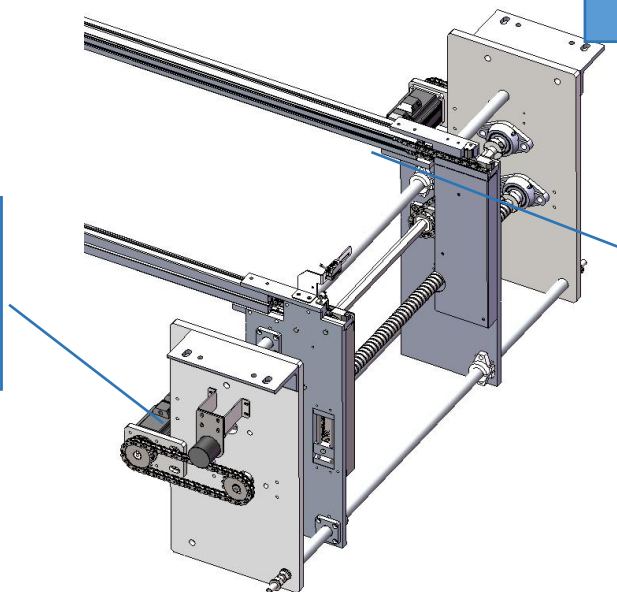
preheating zone using imported heating tube heating + China Taiwan BRILLIANCE 250 watts of high-power high-temperature motor, through the Japanese Mitsubishi frequency converter computerized control of wind efficiency and heat to adapt to a variety of craft made of



Nitrogen flow control



Adopt upper 3 + lower 2 cooling method, improve the cooling slope, fast and efficient! Upper 3 for 1 heating (to avoid rapid product cooling product pad rupture) +2 water cooling method (rapid cooling) lower 2 for closed-loop air cooling cooling method!



INNOVANCE servo+motor automatically adjusts the width, computer inputs the required width, and 3 groups of tracks are adjusted in linkage! Stable and reliable.

Conveyor rail only with aluminum alloy + titanium powder alloy hardening treatment, wear-resistant, anti-fatigue, anti-deformation, 3 sections of transport are used in INNOVANCE servo + motor control, bus control mode, running speed, position pulse, the actual torque, IO status, 3 sections of the speed error is controlled within 1%, running smoothly, stable and reliable.

Precise pressure and temperature control curves

As with standard reflow soldering, the heating zones are insulated from each other and the temperature of each zone can be adjusted individually, ensuring flexible temperature profiles and soldering processes;

When the vacuum process is turned on, the temperature profile can still reach the set values ($TL \leq 90s$, $TP \leq 240^{\circ}C$) even at pressures below 10 mbar; with the help of the infrared heating function inside the chamber, the temperature of the components in the vacuum chamber unit can reach the conventional standard settings, which ensures the realization of highly efficient temperature production processes.

Comparison of vacuum welding results

Nitrogen environment welding: the incidence of welding bubbles under normal atmospheric pressure is about 25%, the bottom of the welding area of a larger chip up to 40%.

Nitrogen environment + vacuum welding: welding under vacuum air pressure, the incidence of bubbles is about 1%-5%, and can even reach about 0.5%.

3. Equipment parameters

- Outer size: 6600*1670*1570mm
- Main Color: Computer Gray
- Approx. 4300KG
- Net weight: Approx. 4300KG
- Exhaust air volume: 10m³/min×2 channels
- Power supply: 5-wire 3-phase; 380V 50/60HZ
- Power: Starting power 72KW, Working power:16KW(including vacuum pump)
- Heating up time: about 45mins
- Temperature range: heating zone - 300°C, vacuum zone - 280°C
- Vacuum degree: 1mbar~10mbar
- Maximum overboard width: 460mm
- Part height: 40mm above the board / 30mm below the board
- Maximum support size of vacuum chamber: 450mm*450mm
- Direction of transportation: left to right
- Rail fixing method: front fixing
- Height of guide rail from the ground: 900±20 mm
- Transportation speed: 300-2000mm/min
- Parameter storage: can store a variety of production setup parameters and conditions
- Abnormal alarm: ultra-high or ultra-low temperature alarm, sound, light two ways
- Lubricating oil filling: automatic manual mode can be switched freely

4. Equipment Configuration

- Number of heating/cooling zones: 10 heating zones + 2 vacuum chamber heating + upper 1 cooling heating + upper 2 water cooling zones (lower 2 closed loop cooling)
- Heating zone length: 7 preheating zones + 3 high temperature zones 3500mm, 2 vacuum chamber heating 760mm
- Temperature control mode: PID closed-loop control + SSR drive;
- Temperature control accuracy: ± 1.0°C
- PCB Transportation Method: chains
- Cooling method: water-cooled, 5 HP external water cooler, sufficient cooling capacity to meet the requirements of lead-free process.
- Motorized opening of the upper temperature zone cover: standard equipment
- Three modes of operation: Run/Demo/Edit Standard configuration
- Online editing function: standard configuration
- Flux management: Nitrogen chamber with standard air circulation filtration, optimizing the furnace environment, easy to maintain.

5. Nitrogen system

- Inlet and outlet nitrogen protection device
- Flux Recovery System
- Nitrogen flow meter
- Nitrogen consumption (standard) 500PPM at 30m³/hr

6. List of main accessories

Name	Brand	Place of origin
Single-stage oil vacuum pumps	BUSCH	Germany
Absolute Pressure Sensors	LEYBOLD	Germany
Converter	Mitsubishi	Japan
Servo drive	INNOVANCE	China
Servo motor	INNOVANCE	China
Industrial PLC	BECKHOFF	Germany
Industrial Control Host	Yanjing	China
Monitor	Philips	Japan
Bus module	BECKHOFF	Germany
Temperature control module	BECKHOFF	Germany
Digital Output Module	BECKHOFF	Germany
Solenoids	SMC	Japan
Regulators	SMC	Japan
Fuse wire	Chnt	China
Relay	OMRON	Japan
Middle relay	OMRON	Japan
Intermediate Relay Base	OMRON	Japan
Solid State Relay	Carlo gavazzi	Switzerland
Monitoring Relay	Carlo gavazzi	Switzerland
Three-phase filters	Mengsheng	China
Three-phase filters	Huibodun	China
Phase Sequence Protector	Carlo gavazzi	Switzerland
Contactor	Schneider	Germany
High temperature fiber	Mingzhi	Japan
Optical reflector	Xike	Germany
Switching power supply	MEANWELL	China-Taiwan
Oxygenimeter	Jilairui	China
Heat pipe	Luquan	China-Taiwan
High Temperature Motor	BRILLIANCE	China-Taiwan
32A Double Pole Switch	Schneider	Germany
Protruding plate-glazed eyes	OMRON	Japan
Lifting Screws	Kangfeiya	China-Taiwan
flowmeter	Yuanda	China
Limit switch	Schneider	Germany
UPS	Tianma	China
Button	Hequan	Japan
Oil injection pump	Ruirun Machinery	China
Tricolor light	Ouen	China
Pressure sensors	Qidian	China
Bearing	NSK	Japan
Thermocouples	Baoguang	China-Hong Kong