

## Technical Specification for Model RSA2310-8NH11 Atmosphere Conveyor Furnace



HengLi RSA2310-8NH11 belt furnaces are designed for glass to metal seal applications in high volume production setting.

### **MAIN CHARACTERISTICS**

Item	Unit	RSA2310-8NH11
Loading Table	mm	900
Pre-Heating	mm	750
Heating Zone	mm	4000
Transition	mm	1500
Water Cooling	mm	3200
Transition	mm	700
Unloading Table	mm	900
Total Length	mm	11950
Zones		10
Power	KVA	90
Belt Width	mm	225
Opening Height	mm	100
Gas Inlet		8
Main Application	Glass to Metal Seal	
Production Volume		High Volume Production
Other available upgrade (extra charge may apply)	Zones	5-16 zones
	Belt Width	200~250 mm

The quoted unit features 4000mm of heated length comprised of 10 independently controlled heat zones. The process chamber in this model is able to maintain a gas tight atmosphere. Process materials are carried through the furnace on a 225mm (9 inches) wide belt with 50mm (2.00 inch) of product



clearance over the belt. A VGA Color Graphic Monitor, personal computer and Windows XP based furnace control software are installed for temperature and conveyor speed monitoring, setting of profiles, and recipe storage. The CPU and monitor are mounted on a swing arm at the exit end of the furnace. Each furnace zone is monitored and controlled using a type "K" thermocouple in the center of each heated zone. These ports connect to the Microprocessor, described above so that profiling thermocouples can be connected and used with the software to capture, display, printout, and store profiles. Product cooling is accomplished by utilizing a graduated water cooling module, including exit N<sub>2</sub> curtain and baffle assembly. The standard cooling method for the graduated cooling module is facility water at 30LPM/2~4 BAR. Air cooling may be specified at no additional charge.

### **ADVANTAGES**

Rated to 1,050° C, the RSA Series has a high-temperature muffle for clean application and features an ultra-clean low-mass refractory heating chamber. The RSA2310-8NH11 heats from ambient to 1,050° C in approximately 60 minutes, and is designed to sustain continuous on/off heating and cooling cycles resulting from alternating periods of production and nonuse. HengLi RSA Series is an energy efficient precision thermal processing system that provides unequalled performance through features such as:

1. 6 channel temperature profiler unit for independent temperature profiling. Includes 3 T.C., sampling unit and analyses software, LCD data display and check, RS232 interface to computer.
2. Atmosphere distribution and management system eliminate thermal shock and process contamination.
3. High-temperature muffle for a clean application.
4. Ultrasonic belt cleaning system including drying system.
5. Windows XP DSC based profiling and monitoring system for monitoring, recording the firing process, including temperature and speed.
6. UPS for the computer system and conveyor drive for power failure.
7. Extraction of burn-off effluents across entire chamber width improves yields.
8. Stable, special temperature uniformity control ensures consistent "firing" results.

### **TEMPERATURE PROFILE**

Ramp up to 1050° C in 10-15 minutes, with a brief hold at that temp (10 seconds) and then cool. Exit in about a total of 30– 45 minutes.

### **PERFORMANCE SPECIFICATIONS**

1. Maximum Temperature Rating: 1,050° C
2. Normal Operating Temperature: 200-900° C
3. Cross-Belt Temperature Uniformity:  $\pm 2^{\circ}\text{C}$  typical,  $\pm 1^{\circ}\text{C}$  across belt uniformity achievable in peak zones
4. Protections: over temperature, low gas pressure and over load.
5. Cooling Modules: Water cooling is standard method for the graduated cooling module. Uses facility water at 30LPM/2-4 BAR. Air cooling may be specified at no additional charge.
6. Atmosphere System: 8 independently adjustable gas inlets for uniform flow distribution across entire chamber width.
7. Clearance above Conveyor Belt: 50mm (2 in)
8. Belt width: 125mm (5 in)
9. Belt Speed Range: 50-200mm per minute (2-8 in)
10. Drive System: variable frequency control, digital speed display.



11. Exhaust System: 2" diameter air powered venturi exhauster. Full chamber width exhausting. Removable condensate collection trap. Exhaust flow adjust by amplified gas.
12. Heater Warranty: 2 Years

#### **TABLES**

1. Loading table is 600mm long and 1,000mm wide.
2. Un-loading table is 600mm long and 1,000mm wide.
3. Tables are stainless steel.
4. Entrance table has three thermocouple ports. Thermocouple ports connect to the microprocessor, so that profiling thermocouples can be connected and used with the Windows based DSC system to capture, display, store, and print profiles.

#### **APPROXIMATE LENGTH OF FURNACE**

11,950mm

#### **CONVEYOR SYSTEM**

1. Belt material Nichrome V mesh
2. Belt Mesh: Balanced Spiral
3. Belt Loading: 100 kg per square meter
4. Belt Speed: 50~200mm (2-8 in.)/min. Belt speed is programmable in IPM with readout on the PC. Deviation from set point alarm is programmable. Range of speeds specified refers to adjustability of belt speed only, and does not imply compliance with load and temperature requirements over the range of belt speed adjustability. An alarm will alert stoppage of conveyor belt.
5. Speed Control: variable frequency motor controller, digital displayed.

#### **TEMPERATURE CONTROLS**

1. Microprocessor controls furnace.
2. Zones 1-6 are controlled with several single loop intelligent temperature controllers. The controller is a high performance, single ASIC with full auto-tuning PID.
3. Each furnace zone is monitored and controlled using a type "K" thermocouple in the center of each heated zone.

#### **OVERTEMPERATURE PROTECTION**

The furnace is equipped with a redundant overheat safety protection system which incorporates an additional type "K" thermocouple in the center of each controlled zone and a multi-loop alarm.

#### **ATMOSPHERE CONTROL SYSTEM**

1. Hengli's atmosphere control system is included for operating in Nitrogen or Hydrogen atmospheres. Six routes of flowmeters are provided as follows:
  - 1 – Entrance curtains (N2)
  - 1 – Exit air curtains (N2)
  - 2 – Exhaust gas (N2)
  - 2 – Process gas (H2)



- 1 – Purge gas (N2)
2. The PC can silence low pressure alarms.
3. Gas sample ports are located
  - 1 – Middle of heated section
  - 1 – Incoming supply
4. The adjustable range is from 0 to 70 liters per minute.
5. The gas ports are capped internally to the furnace frame for easy connection to optional atmosphere analyzing.
6. Furnace can be used with air, nitrogen, or hydrogen in nitrogen forming gas. Designed for high-rate hydrogen application.
7. Burnout atmosphere is fed into the furnace at end of zone 1. Firing section atmosphere is fed into the furnace at the cooling section.

#### **ELECTRICAL SPECIFICATION**

1. Connected Load is 90KW
2. Operating from 220V, 3 phase power transformer, with 3-wire 50-60 Hz
3. Heater power figure is approximate and should not be used for design purposes. Actual loading (KVA) is determined at the time of engineering and notification will be sent to Medtronic.

#### **UPS**

1. UPS is available as an option.
2. Emergency off buttons are located at each end of furnace connected to 24V emergency off circuit.

#### **PHYSICAL CHARACTERISTICS**

1. Off-white color.
2. Approximate weight is 3,000 kg.

#### **MANUALS**

Instruction, operations, and maintenance manuals are included.

#### **PROTECTIONS**

Over temperature, low gas pressure and over load.