

### Lyra Series Lead Free Reflow Oven



#### Introduction:

I.C.T Lyra series lead-free reflow oven I.C.T's mature product after years of market testing. Lyra series reflow oven has maintained a larger share of the market for many years. Its unparalleled heating performance and temperature control system meets the requirements of various welding processes. It is I.C.T's crystallization of years technical research and development. Lyra series lead-free reflow is high-end reflow products committed to keeping up with market demand to enhance customers competitiveness. Its new design concept fully meets the needs of increasingly diverse processes. And considering the future direction of the industry, entirely suitable for communications, automotive electronics, home appliances, computers and other consumer electronic products.

#### Features:

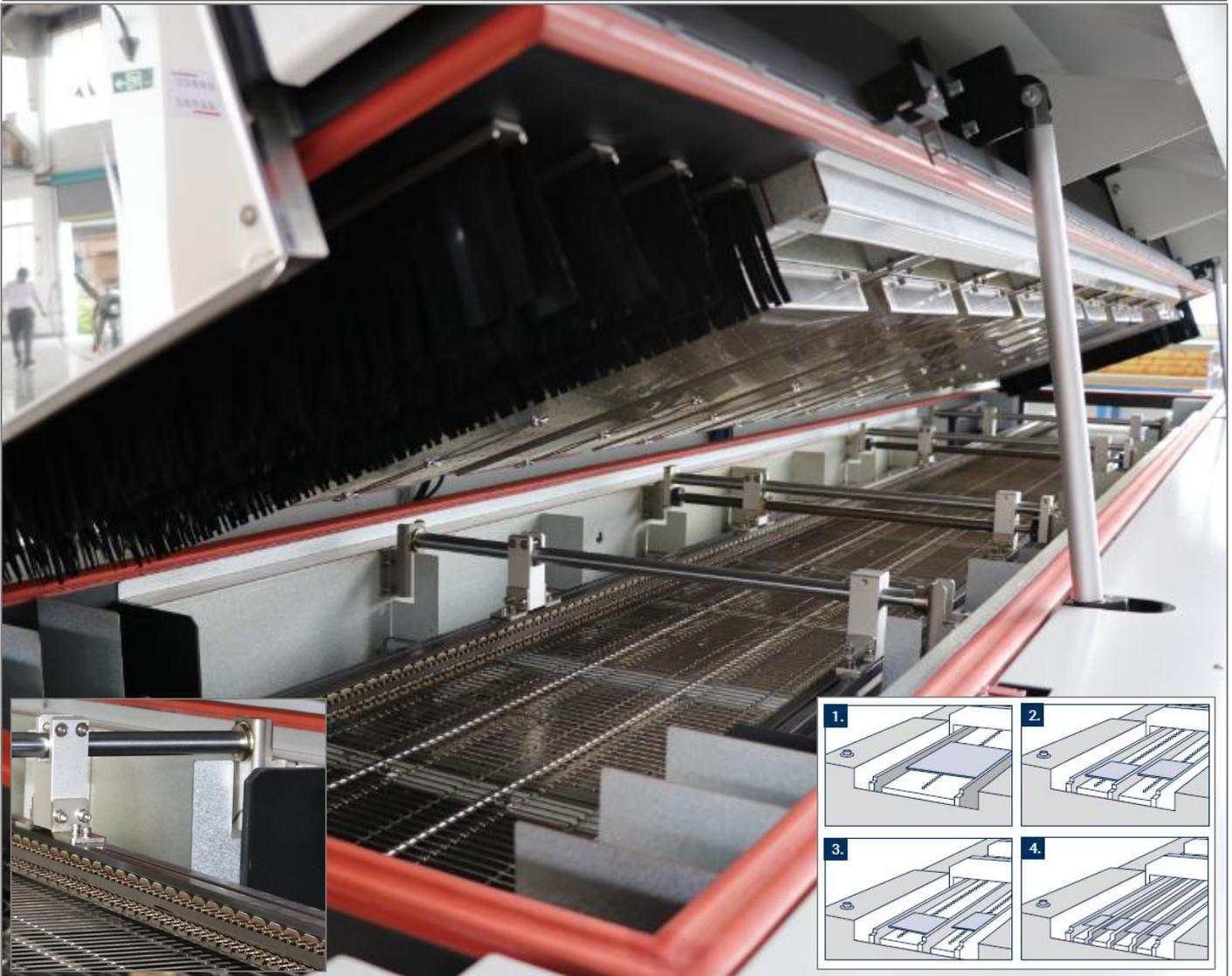
1. Control System: PC+Siemens PLC control system, accurate temperature control and more stable, ensures temperature stability rate to be more than 99.99%;
2. Hot air system: first-class heating module, the best temperature zone interval design makes optimum temperature uniformity and repeat. The effective utilization and thermal compensation efficiency, it needs less than 20 minutes from temperature control accuracy  $\pm 1^{\circ}\text{C}$  ambient temperature to a temperature stabilization;
3. Monitoring Software: Windows interface, traditional and simplified Chinese and English online free switch, and operator password management, easy to operate. Operation records, temperature curve measurement and analysis functions, virtual simulation, fault self-diagnosis, process monitoring, automatic generate and save process control documents, substrate transport dynamic display;
4. Cooling System: new cooling zone, quick and easy adjustment, easily reach the cooling requirements of different slopes;
5. Temperature protection: I.C.T using third-party over-temperature protection, multiple layers protection to ensure safe operation;
6. Products comply with CE, CCC, UL, other standards and specifications;
7. User-friendly design: fault detection (such as heaters abnormal alarm, etc.), regular maintenance reminders, the economy functions and tool-free maintenance, reducing equipment failure rates;
8. Heating module: transverse reflow design makes temperature from each zone is not influenced by neighbour to ensure accurate temperature curve, while ensuring a high production capacity and heat exchange capacity to achieve high adaptability (to meet the soldering of automotive, communications, electronics, computers and mobile phones consumer electronics);
9. Hot air motor with independently inverter controlled, set operating frequencies depending on different technology to meet a variety of lead-free processes;
10. Machine using zero gas source design, furnace cover with motor lifting, safety rod support, providing significant security;
11. Main parts: imported main parts ensure equipment runs smoothly and lower the maintenance cost;
12. Customers can choose optional flux processing system according to their own production features to ensure furnace chamber clean;
13. Closed-loop transmission speed control systems, transportation accuracy  $\pm 2\text{mm}/\text{min}$ , ensuring more stable transmission speed;
14. Central support, dual transmission, external water cooling system is optional.

**TOP Advantage:**

1. Simple: combined with advanced international concepts, based on the Oriental-designed operating system, easy to understand, easy to learn, easy to maintain;
2. Expertise: learn imported reflow oven's advanced design concepts, and the machine core components are using imported top brands;
3. Hedging: import hardware configuration, low failure rate in production, more than a decade service life;
4. Safety: based on the general rules of international design, close to imported reflow rating, the highest security level;
5. Stable: mature software, hardware and top production processes ensures stability of each equipment.

**Product:**





### Transport System

- <Reliable, failure-free production guaranteed by absolutely parallel transport;
- <Precise and repeatable adjustment of the transport width;
- <No influence of the temperature profile by transport or center board support;
- <Reduced maintenance, transport drive mechanism is outside of the process chamber;
- <Ideal for any application due to various transport systems;
- <High process reliability by integrated center board support.

1. Single lane transport  
one adjustable chain;
2. Dual lane transport  
two adjustable chains, synchronous/  
asynchronous transport speed;
3. Multi-track transport  
three adjustable chains, synchronous/  
asynchronous transport speed;
4. Quad lane transport  
four adjustable chains, synchronous  
transport speed and width adjustment.



From zero to 240 °C  
due to optimized heat transfer

Each product has its own requirements in the manufacturing process. Optimized heat transfer over the entire soldering process is the basis for best possible results.

The Lyra-Series offers flexibly controllable preheating zones within which your PCB is preheated and prepared for the actual soldering process.

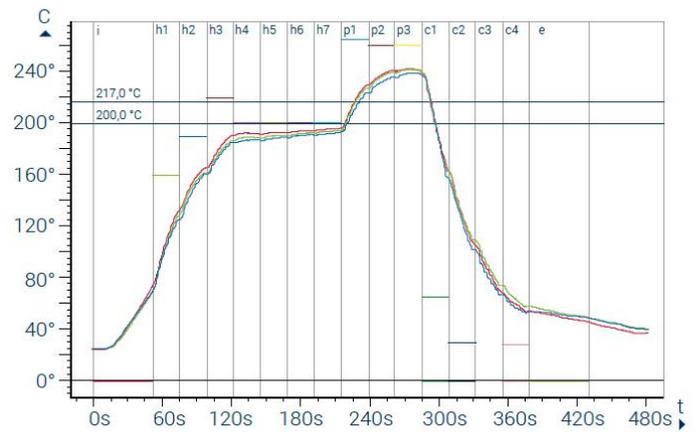
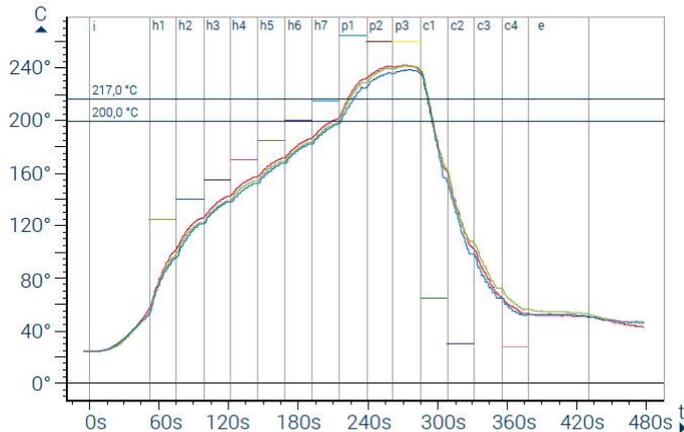
The individual zones can be controlled independently of each other via fan frequency, and assure best possible processes.

The Lyra-Series is equipped with special nozzle sheets for optimized heat transfer by means of uniform air flow over the PCBs. Flow speeds in the upper and lower heat zones can be separately controlled, assuring that your PCB is heated up.

Through and through – completely and uniformly.

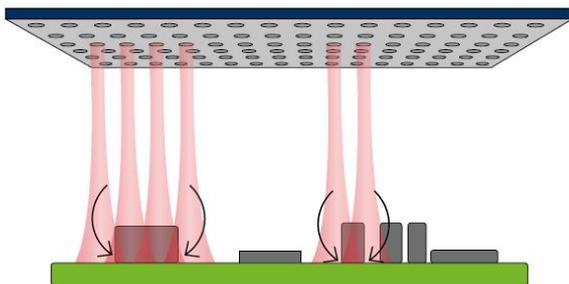
This prevents stressing of the material which can disturb the soldering process. In addition, smaller components are not overheated and bigger ones are still heated through enough. To ensure that the heat flow in the system runs stably and the outward heat radiation is as low as possible, our Lyra systems have optimum insulation between the process chamber and the exterior wall.

Using precise profiling we can generate precision-reproducible temperature profiles which are tailored to component size, material or process parameters.



**Saddle profile**

The component is brought to a temperature of at least 240 °C for soldering. Using a saddle profile the board is gradually heated in line with pre-defined, individual temperature ranges. Even components with differing thermal masses are heated homogeneously and temperature differences minimised.



Homogenous heat transfer

**Intelligent Thermal Profiler**



**Linear profile**

With a linear profile, the component is not heated in a stepped manner during soldering, in fact it is heated along an identical linear temperature gradient. Linear profiles can reduce cycle times and can help to reduce soldering errors such as tombstoning.

**Convection**

The centrepiece of our Lyra -Series is the process chamber with its outstanding heat transfer owing to advanced hole nozzle geometry as well as monitored adjustable over pressure in the heating module, guaranteeing homogeneous and gapless heat transfer to the circuit board.

The inert process atmosphere can be assured throughout the entire soldering process and beyond because the closed system ensures that no external air finds its way into the process chamber. The heat flow within the system takes place by means of circulation, i.e. the process gas of the preheating and peak zones is extracted, cleaned and reinserted into the process at the sides.

**Function**

KIC X5 uses multiple temperature sensors to measure the temperature of electronic components in the reflow oven, and monitors and records the data in real time through computer software.

- Real-time temperature monitoring;
- Temperature curve analysis;
- temperature curve record;
- View historical data.

Improve product quality and production efficiency, and ensure that electronic components reach the required temperature range during the reflow soldering process.

The above temperature test curves are all tested by KIC X5.

**Heating System**

- < Separately adjustable heating zones;
- < Reproducible temperature profile
- < Outstanding process stability with the smallest possible  $\Delta T$
- < Homogenous heat input over the entire PCB thanks to specially designed nozzles
- < Low maintenance effort



**A clean machine:**

**Effective Residue Management**

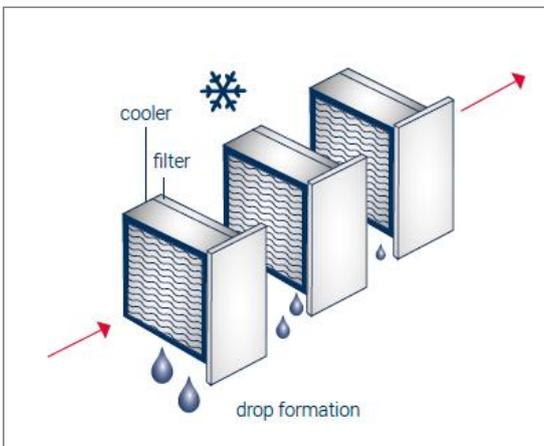
As is the case with all industrial processes, substances are generated during SMT production which have to be removed from the process cycle because they contaminate the system. Our highly effective residue management function purifies the process gas safely and reliably, and keeps your system clean and dry.

The residue management function included in the Lyra-series combines depending on the system type two different modes of action: pyrolysis in the heat zone and cold condensation in the cooling tract's filter units. Liquid and crystalline residues are effectively removed by means of this combination.

Lyra is equipped with pyrolysis and filter units in the cooling zone as

standard. Pyrolysis can optionally be added to Lyra models for the purposes of cold trapping.

Your system's cleaning efficiency is significantly increased. The first pyrolysis unit is located underneath the inlet area. It purifies the nitrogen from the heating zones. The second pyrolysis unit is installed on top of the inlet area and filters the process gas from the heating zones. Cleaning efficiency is significantly increased for the process gas and the soldering system's chambers are kept clean and dry with very little maintenance and minimal downtime.



**Cold condensation**

Liquid residues condense above all on the cooling tract's filter units, by which they are then removed.

The system is easy to clean. The filters are exchanged in sets at the back of the system.

The process chamber doesn't even have to be opened.

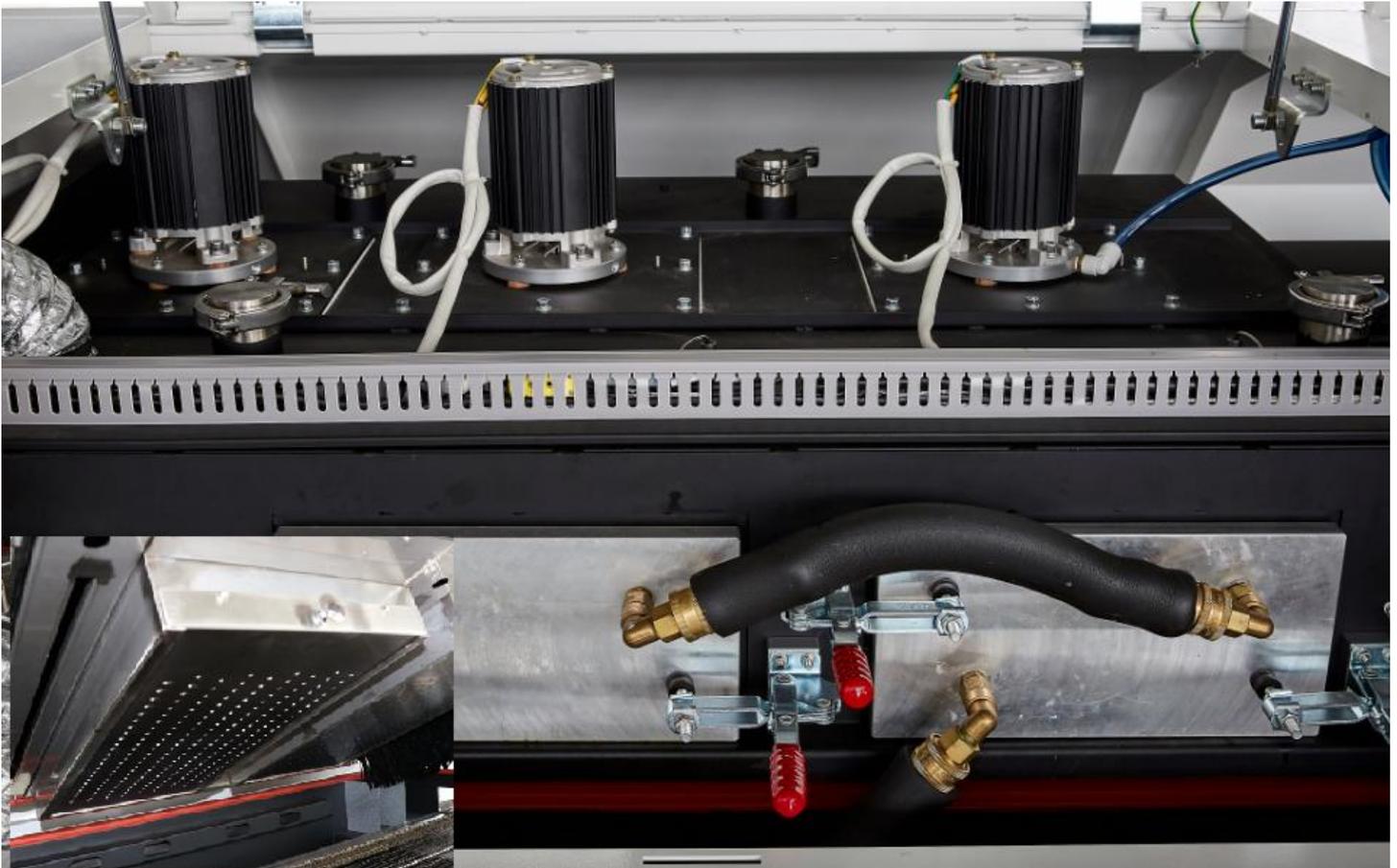
Depending on system type, the oven is equipped with a 2, 3 or 4-stage condensation trap.

**Cleaning System**

- < Efficient cleaning for a clean and dry process chamber;
- < System integrated solution;
- < Reliable, stable process;
- < Easy accessibility;
- < Low maintenance effort.



**Low**  
maintenance  
expenses



**Stress-free to below 50 °C  
with powerful cooling systems**

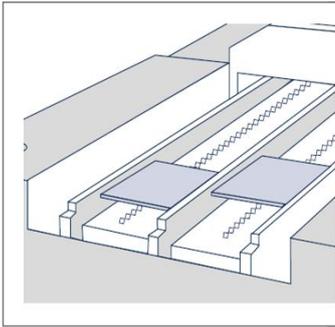
It is important to have a high-performance cooling tract in order to guarantee optimum soldering results and ensure that modules are cooled gently.

I.C.T Systems offers a wide range of cooling tract variants for reflow convection soldering with its Vision X-Series, which can be precisely fine-tuned to suit any production process. The water-cooled standard solution with heat exchanger and adjustable ventilation system works as an effective "Closed Loop" system. There are several efficient, additional options for large and high-mass boards, primarily a power cooling unit as an extended cooling tract or a bottom cooling system.

**Cooling System**

- < Stress-free cooling using individually adjustable ventilators in the classic cooling zones;
- < Gentle cooling through the use of the power cooling unit as an extended cooling tract;
- < Optimum cooling of large, high-mass boards thanks to additional bottom cooling;
- < Flexible combination possibilities through a range of different options;
- < New, sustainable cooling principle as a result of liquid nitrogen cooling.

**Option:**



Dual lane transport



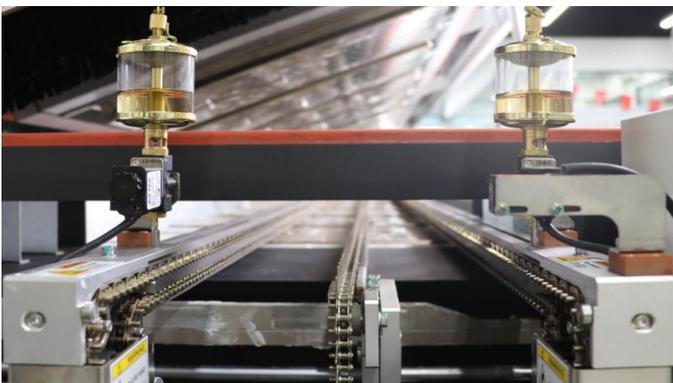
Nitrogen protection



MES



Chiller



Center Board Support

**Materials List:**

No.	Item	Brand	Original
1	Computer	Lenovo	China
2	PLC	DCCE, Siemens	China, Germany
3	Solid relay	Carlogavazzi	Switzerland
4	Contactora	Schneider	France
5	Transmission motor	Panasonic	Japan
6	High Temp. Motor	Sanyue	Taiwan
7	Heating wire	Hotset	Germany
8	Guide rail	I.C.T	China
9	Chain& Chain shackle	KMC	Taiwan
10	Heat cotton	RockWool	Germany
11	Frequency converter	Delta	Taiwan
12	Button	Schneider	France
13	UPS	STK	USA
14	High Temp. Wire	Hotset	Germany
15	Cooling motor	Sanyue	Taiwan
16	Mesh	TSUBAKI	Japan

**Specification:**

Model	I.C.T-Lyra 622	I.C.T-Lyra 622N	I.C.T-Lyra 733	I.C.T-Lyra 733N	I.C.T-Lyra 933	I.C.T-Lyra 933N
<b>Dimensions</b>						
Dimension	5150*1400*1500mm		6250*1400*1500mm		6950*1400*1500mm	
Height with open hoods	ca. 2200 mm					
Required area	10.82m <sup>2</sup>		13.20m <sup>2</sup>		14.60m <sup>2</sup>	
Weight	ca. 2400 kg	ca. 2600 kg	ca. 2800 kg	ca. 3000 kg	ca. 3200 kg	ca. 3400 kg
Load per unit area	400kg/m <sup>2</sup>					
<b>Process Chamber Heating</b>						
Length of heating zones	3030mm		3730mm		4460mm	
Quantity of preheating zones	6	6	7	7	9	9
Length of preheating zones	2260mm		2575mm		3305mm	
Quantity of peak zones	2	2	3	3	3	3
Length of peak zones	770mm		1155mm		1155mm	
Max. soldering temperature	pre-heating zones 300°C and peak zones 350°C					
Heat transfer through	Forced convection					
Warm up time	ca. 20 min					
<b>Cooling Zone</b>						
Quantity of cooling zones	2		3		3	
Length of cooling zones	1160		1560mm		1560mm	
<b>Conveyor</b>						
Conveyor height	900±30 mm					
Mesh width	Standard: 440mm (Option: 560 & 680mm)					
Rail width	Single Rail: 50~460mm (Option: 50~686mm or other width) Dual Rail Standard: 50~290mm*2					
Clearance above the conveyor	30 mm					
Pin chain support width	Standard: 5mm (Option: 3mm)					
Adjustable conveyor speed	300~1800mm/min					
<b>Operating Date</b>						
Maximum noise level	ca. 55 dBA					
Room temperature	Between 15°C and 32°C					
Humidity	Between 30 % and 75 %					
Oxygen of peak zones	<500 ppm					
<b>Interfaces Type</b>	SMEMA					
<b>Voltage Supply Consumption</b>						

Type of power system	(L1, L2, L3, N, PE) / 5 Wire System		
Voltage supply	5 Wire System 3P, N, PE 380 VAC ± 5%, 50 Hz. Other voltages upon request		
Energy consumption standby-mode	ca. 8KW	ca. 10KW	ca. 12KW
Connected load	55KW	64KW	72KW
Operating capacity	10 KW	12 KW	14 KW
*As the operating efficiency depends on the settings of the process parameters, the values reached actually can differ from the values indicated here.			
<b>Cooling Water At External</b>			
Connection	System specific, please see layout plan		
Cooling water flow	Between 25~35 l/min (according to temperature)		
Operating pressure	2~5 bar		
<b>Nitrogen Supply</b>			
Connection	System specific, please see layout plan		
Nitrogen supply pressure	6~10 bar		
Operating pressure	5 bar		
Nitrogen consumption single conveyor at <1000ppm in peak zone, max. PCB width 200mm. PCB gap 50mm.	622: ca.25 m <sup>3</sup> /h 733: ca.30 m <sup>3</sup> /h 933: ca.35 m <sup>3</sup> /h		
Nitrogen consumption with N2-control in Standby Mode 200mm transport width.	622: ca.22 m <sup>3</sup> /h 733: ca.27 m <sup>3</sup> /h 933: ca.32 m <sup>3</sup> /h		
*As the nitrogen consumption depends on the PCB-width and the throughput, the values reached actually can differ from the values indicated here.			
*Set-up indications: The system should not be exposed to draught.			
*Devices generating a flow to the system or from the system away should not be installed directly in front of the system or behind the system.			
<b>Exhaust Process</b>			
Exhaust socket diameter	2*145mm		
Exhaust at min. 5mbar under pressure	2*20~25m <sup>3</sup> /min		
Exhaust internal cooling	1*1300m <sup>3</sup> /h (No Water Connection)		
Exhaust internal chiller system	1*3500m <sup>3</sup> /h (Power Cooling)		
Exhaust temperature	<45°C		

**Standard Accessories:**

No.	Item	Quantity
1	Computer	1 set
2	Operation Software	1 set
3	Rail Width Adjustment Handle	1 pcs
4	High Temperature Gloves	1 pair
5	Allen Key	2 pcs
6	Phillips Screwdriver	1 pcs
7	K-type thermocouple	1 pcs
8	Manual	1 book
9	Adjustable Wrench	1 pcs
10	Flat-blade Screwdriver	1 pcs
11	Door Panel Triangle Key Switch	2 pcs
12	24mm Open End Wrench	1 pcs
13	Toolbox	1 pcs

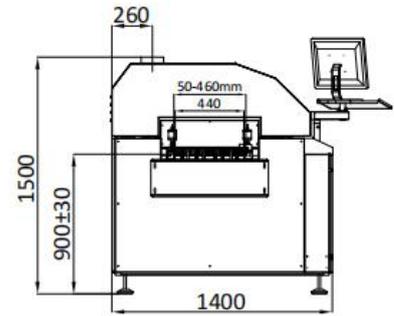
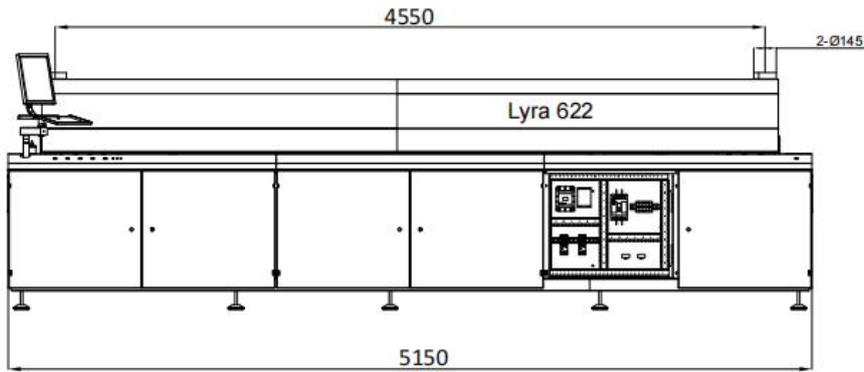
\* Attachments may change with product upgrade. If different, please follow the new list.

**Recommend Spare Parts:**

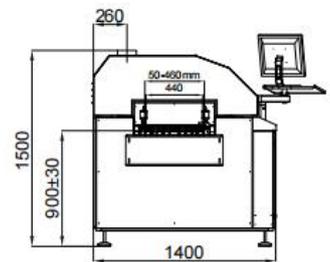
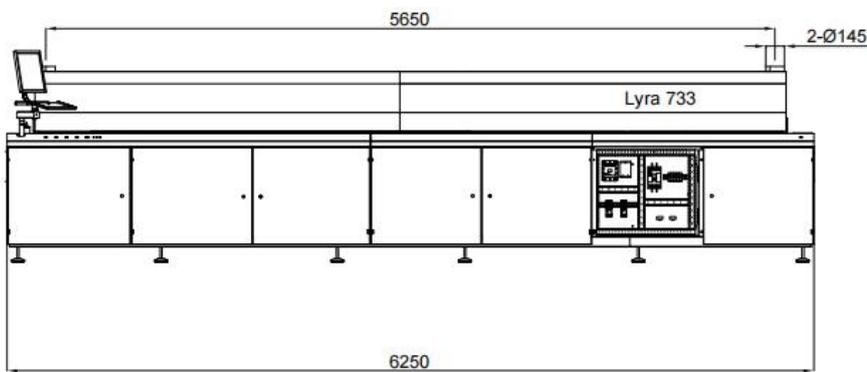
No.	Item	Spec.	Quantity
1	T-variable	/	2 pcs
2	Compression springs	Size: 65mm	2 pcs
3	Bearings	NSK-61800ZZ	4 pcs
4	High temperature motors	Power: 150W	2 sets
5	6" wind turbine	Size: 6"	2 pcs
6	Ceramic terminal blocks	/	4 pcs
7	Heat emitting wire	Power: 2KW	2 pcs
8	Heat emitting wire	Power: 1.5KW	4 pcs
9	K-Type thermocouple	/	2 pcs
10	Cooling motor	Power: 150W	1 set
11	Cooling fan (with cover)	Voltage: AC220V	2 pcs
12	Fuse	Electric current: 10A	2 pcs
13	Fuse	Electric current: 2A	2 pcs
14	Fuse	Electric current: 4A	2 pcs
15	Solid state relays	AC51: 40A 400V	2 pcs

**Drawing:**

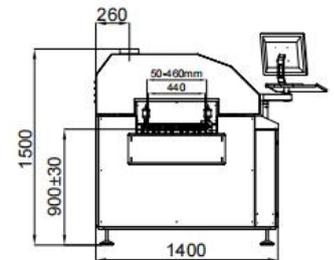
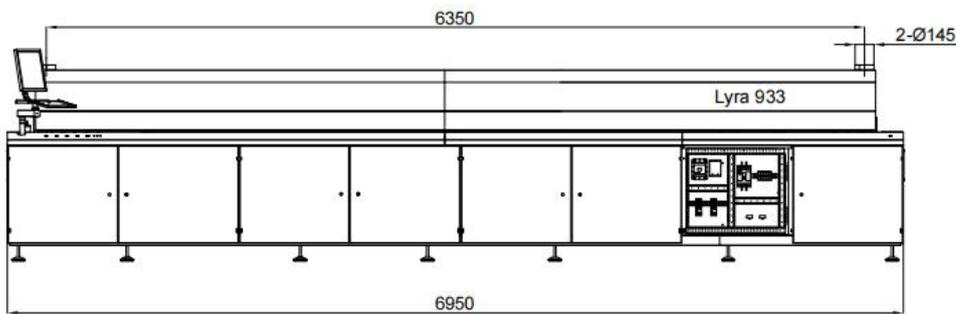
Lyra 622



Lyra 733



Lyra 933



\* I.C.T keeps working on quality and performance, specifications and appearance may be updated without particular notice.

**YouTube Video Link:**

<https://youtu.be/1e4qmwTKOul>

<https://youtu.be/Sf83Us5NLvl>

Thanks for choosing I.C.T.  
I.C.T looks forward to win-win cooperation.  
Thank you.