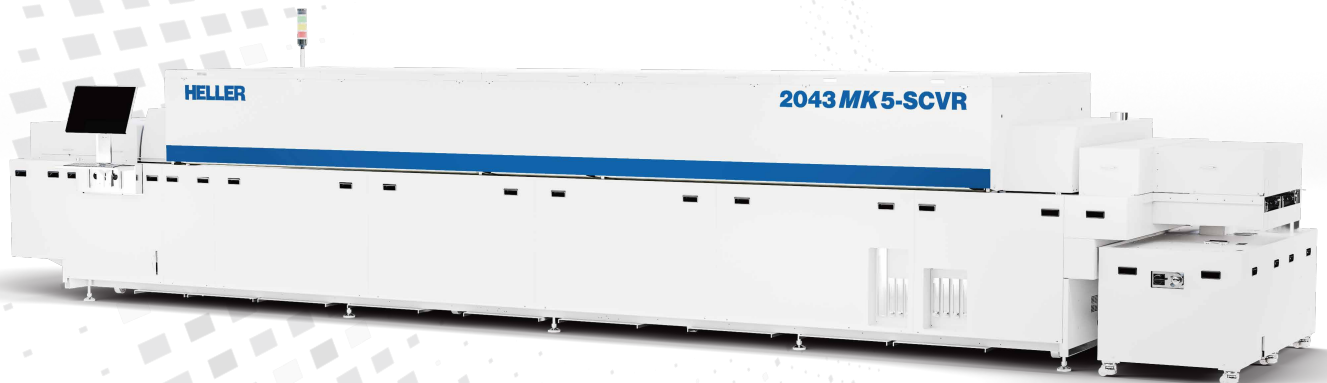


# Heller Short Cycle Vacuum Reflow Oven

Fast Cycle Time for Maximized Throughput





## Short Cycle Vacuum Reflow Oven

HELLER's Short Cycle Vacuum Reflow Oven (SCVR) integrates advanced vacuum soldering technology, a multi-stage conveyor system, intelligent process control, and eco-friendly, energy-efficient design. It delivers superior soldering quality, exceptional process flexibility, and high production efficiency—providing industry-leading solutions. This cutting-edge equipment is the ideal choice for high-end electronics manufacturing, empowering customers to achieve reliable, high-quality soldering results.

### Key Advantages



#### Minimal Cycle Time

The patented, program-controlled multi-stage conveyor system reduces single-board cycle time by half compared to conventional vacuum reflow ovens—effectively doubling units per hour (UPH) and enabling customers to meet stringent production goals.



#### Highly-efficient Vacuum System

The highly-efficient vacuum module with 5 step closed-loop pressure control eliminates solder defects like bubbles and voids, boosting yield by over 30%. It supports diverse processes like lead-free and high-temperature soldering.



#### Smart Temperature Control

AI algorithms optimize the temperature curve in real time, paired with a fast-response heating module for  $\pm 0.5^{\circ}\text{C}$  accuracy and consistent welding. Nitrogen use is cut by 40%, and with  $<50$  ppm oxygen monitoring, operating costs are significantly reduced.



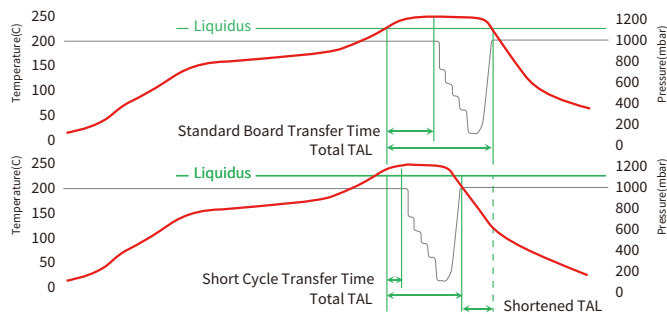
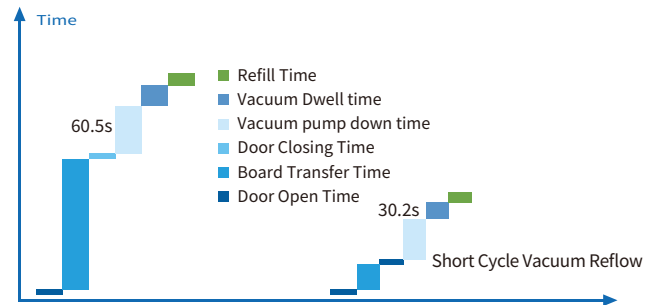
#### Modular Expandability

Oven features a modular design with open architecture, allowing easy upgrades and additional features for enhanced capabilities with ease. A reserved MES interface enables seamless digital factory integration.

## Highlights

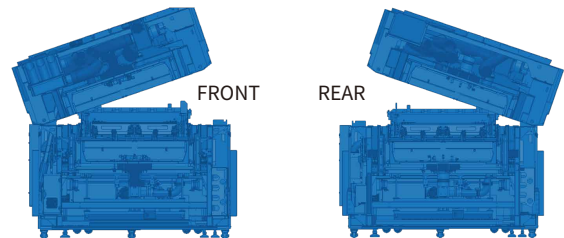
### 1.SCVR System: Innovative High UPH Design

- Multiple independently-driven conveyor systems;
- Multi-stage conveyors rapidly transfer PCBs to the vacuum chamber;
- Adjustable cooling zone conveyor speed to extend dwell time;
- Reduces board transfer time to increase UPH by up to 100%;
- Cooling time extended 50% compared to regular VR.



### 2.Flexible Thermal Profile

By shortening the board transfer time entering the vacuum chamber, the total time above liquidus (TAL) can be optimized to match the solder paste recommendation. By slowing down the cooling conveyor, the cooling zone dwell time can be extended to reduce board exit temperature.



### 3.Dual-opening top shell (Optional)

The oven top shell can be opened from either the front or rear side to maximize access during maintenance and significantly improves cleaning efficiency, serviceability, and operational safety, especially for ultra-wide tracks.

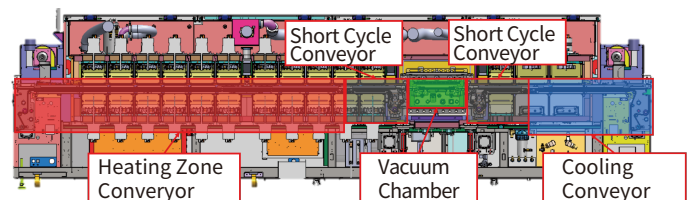
## HELLER Patent

### Innovative Multi-Stage Conveyor system

The five-independent-conveyor system, powered by servo motors, can rapidly transfer products into and out of the vacuum chamber to reduce cycle time.

Patent No.: CN222728852U

Patent Name: A multi-stage speed-adjustable transmission mechanism



## Applications

- High-reliability RF component Vacuum soldering
- Mini LED/Micro LED Mass Reflow
- High-density interconnect soldering
- Highly Reliable SMT
- Automotive-grade IGBT/SiC power module packaging

## Specifications

|  | 1911MK5-SCVR  | 1912MK5-SCVR            | 2043MK5-SCVR            | 2046MK5-SCVR           | 2049MK5-SCVR           |
|--|---|-------------------------|-------------------------|------------------------|------------------------|
| Dimensions                                 |   |                         |                         |                        |                        |
| Overall Oven Dimensions                    | 590 cm (L) × 175 cm (W)   | 620 cm (L) × 175 cm (W) | 680 cm (L) × 175 cm (W) | 720cm (L) × 200 cm (W) | 765 cm (L) ×200 cm (W) |
| Typical Net Weight (Oven / Pump)           | 3800 kg / 500 kg  | 3800 kg / 500 kg        | 4300 kg / 500 kg        | 4900 kg / 500 kg       | 5200 kg / 500 kg       |
| Electric Supply                            |   |                         |                         |                        |                        |
| Typical Power Consumption (Oven / Pump)    | 10~16/4 ~ 7kW@480 V   | 10~16/4 ~ 7kW@480V      | 20~25/4 ~ 7kW@480V      | 20 ~ 25/4 ~ 7kW@480V   | 22 ~ 28/4 ~ 7kW@480V   |
| Process Atmosphere                         |   |                         |                         |                        |                        |
| Typical Nitrogen Consumption               | 150 ~ 400 SLPM (9 ~24 m3/hr)**                                  |                         |                         |                        |                        |
| Minimum PPM Oxygen                         | <=25 PPM  |                         |                         |                        |                        |
| Temperature Control                        |   |                         |                         |                        |                        |
| Temperature Controller Resolution          | ± 0.1 °C  |                         |                         |                        |                        |
| Typical Cross-Width Temperature Uniformity | ± 2.0 °C ***  |                         |                         |                        |                        |
| Temperature Range                          | 60-350 °C (60-450 °C Optional)                                  |                         |                         |                        |                        |
| Forced Convection Heating & Cooling Zones  |   |                         |                         |                        |                        |
| Heating Zones                              | 10  | 11                      | 10                      | 11                     | 12                     |
| Heated Tunnel Length (Convection/Total)    | 282 cm / 351 cm   | 305cm / 360 cm          | 345 cm / 415 cm         | 380 cm / 460 cm        | 410 cm / 490 cm        |
| Cooling Zones                              | 3   | 4                       |                         |                        |                        |
| Cooling Tunnel Length                      | 116 cm  | 137 cm                  | 140 cm                  | 140cm                  | 152 cm                 |
| Vacuum System Option                       |   |                         |                         |                        |                        |
| IR Heater Temperature Range                | 60-400 °C (60-480 °C Optional)                                  |                         |                         |                        |                        |
| Minimum Vacuum Pressure                    | 2 mbar (1.5 Torr)   |                         |                         |                        |                        |
| Vacuum Speed / Pressure Control            | 5-Step Closed Loop Speed / Pressure Control & Dual Stage Refill |                         |                         |                        |                        |
| Vacuum Pump                                | 300m³/hr High-Capacity Rotary Vane Pump                         |                         |                         |                        |                        |
| Edge Hold Conveyor System Option           |   |                         |                         |                        |                        |
| Maximum PCB Size (L × W)                   | 50 cm × 45 cm   | 35 cm × 45 cm           | 50 cm × 45 cm           | 60 cm × 70 cm          | 60 cm × 70 cm          |
| Conveyor Speed Range                       | 1-800 cm/min  |                         |                         |                        |                        |
| Conveyor Direction                         | Left to Right (Right to Left Optional)                          |                         |                         |                        |                        |
| Center Board Support System                | O   | /                       | O                       | /                      | O                      |
| Side Chain Belt Conveyor System Option     |   |                         |                         |                        |                        |
| Effective Belt Width                       | 45 cm   | 45 cm                   | 45 cm                   | Tri-Chain, 2 × 29 cm   | Tri-Chain, 2 × 29 cm   |

\*\* Varies with PPM, product size and oven configuration. Oven only, does not include vacuum chamber refill.

\*\*\* Varies with actual PCB board construction

The specifications of customized products are subject to your confirmed order configurations.  
HELLER INDUSTRIES reserves the right of final interpretation of product descriptions.

## HELLER INDUSTRIES, INC.

### HELLER US

Eastern Office Tel: +1 973 377 6800  
Western Office Tel: +1 512 567 4371  
info@hellerindustries.com  
4 Vreeland Road, Florham Park, New Jersey 07932

### HELLER INDIA

Office Tel: +91 120 460 3500  
info@hellerthermalsystems.com  
SDF No. E - 17, Noida SEZ, Noida Dadri Road, Phase II,  
Noida - 201 305, Uttar Pradesh, India

### HELLER JAPAN

Office Tel: +81 3 6717 4001  
info@hellerindustries.com

### HELLER KOREA

Office Tel: +82 31 769 0808  
info@hellerindustries.co.kr  
125-5, Saneop-ro 156 Beon-gil, Gwonseon-gu,  
Suwon-si, Gyeonggi-do, Korea

### HELLER TAIWAN

Office Tel: +886 3 4757585  
info@hellerindustries.com.cn  
No.6, Lane 740, Gaoshi Road, Yangmei District,  
Taoyuan City, Taiwan  
台湾桃园市杨梅区高狮路740巷6号

### HELLER SHANGHAI

Office Tel: +86 21 6442 6180  
info@hellerindustries.com.cn  
No.227, Minqiang Road, Songjiang District,  
Shanghai, China  
上海市松江区民强路227号

### HELLER EUROPE

Office Tel: +44 777 55 11 008/+36 30 274 2609  
info@hellerindustries.com