



# TRA I-F SERIES

SMART-ENERGY EFFICIENT  
AIR CONVECTION REFLOW OVEN



# TRA I-F HIGHLIGHTS

## Smart Energy Saving

- Highly efficient Heat Transfer
- Excellent Thermal Insulation
- Highest process stability with low Power consumption
- Partial Start-up Capability
- Efficient Flux Removal Structure

## Intelligent S/W

- User-centered Intuitive MMI(Man-Machine Interface)
- Realtime Temperature Profile Monitoring System
- Excellent Traceability

## Durable & Dependable

- Rust-free Stainless steel plate
- Best-in-quality Controller Unit from Internationally renowned brand
- Failure-free Maintenance Alarm Messages
- Board-jam prevention Chain Design
- Highly capable Blower Motor

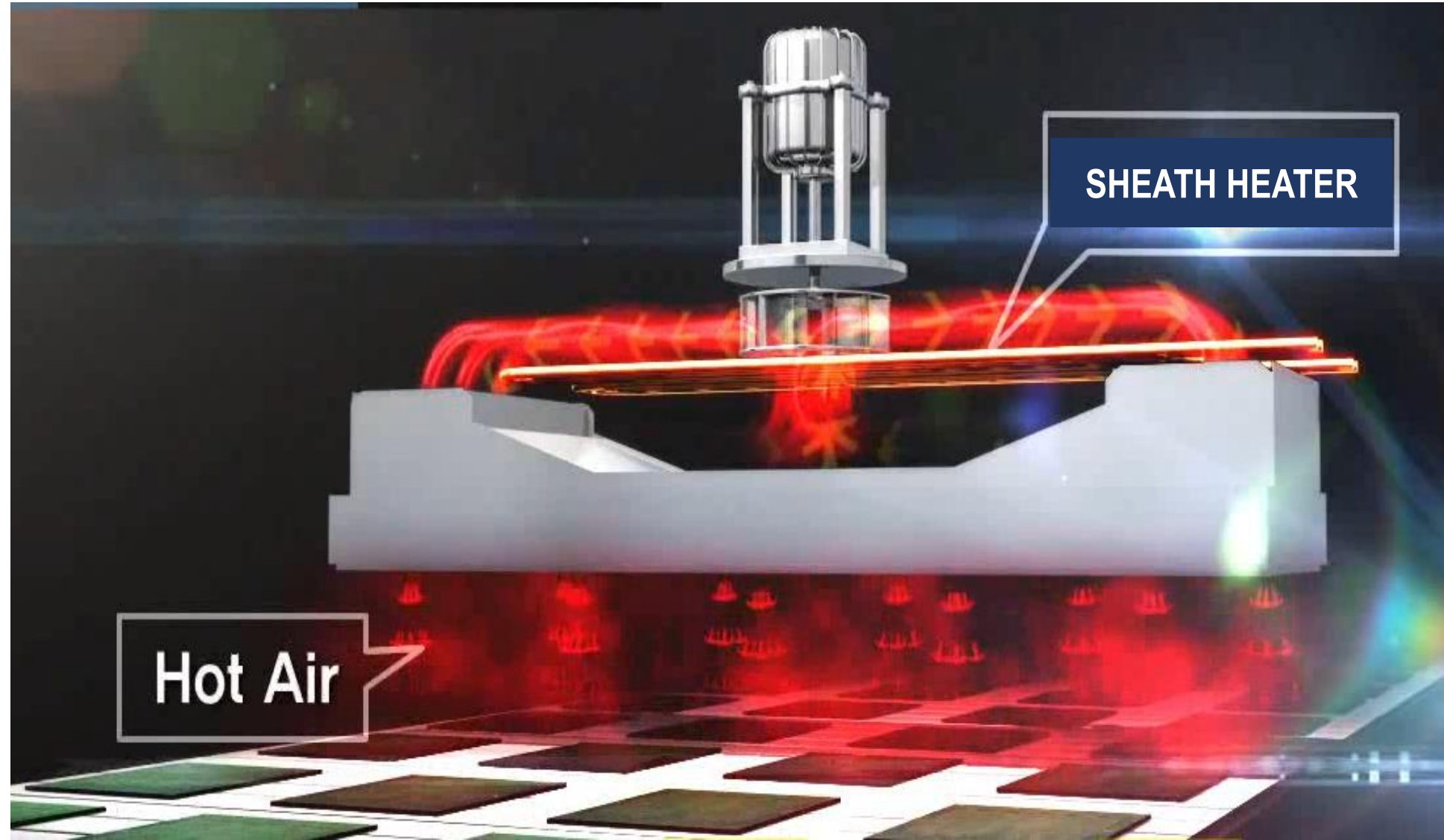


**SMART ENERGY  
SAVING**



# Highly Efficient Heat Transfer

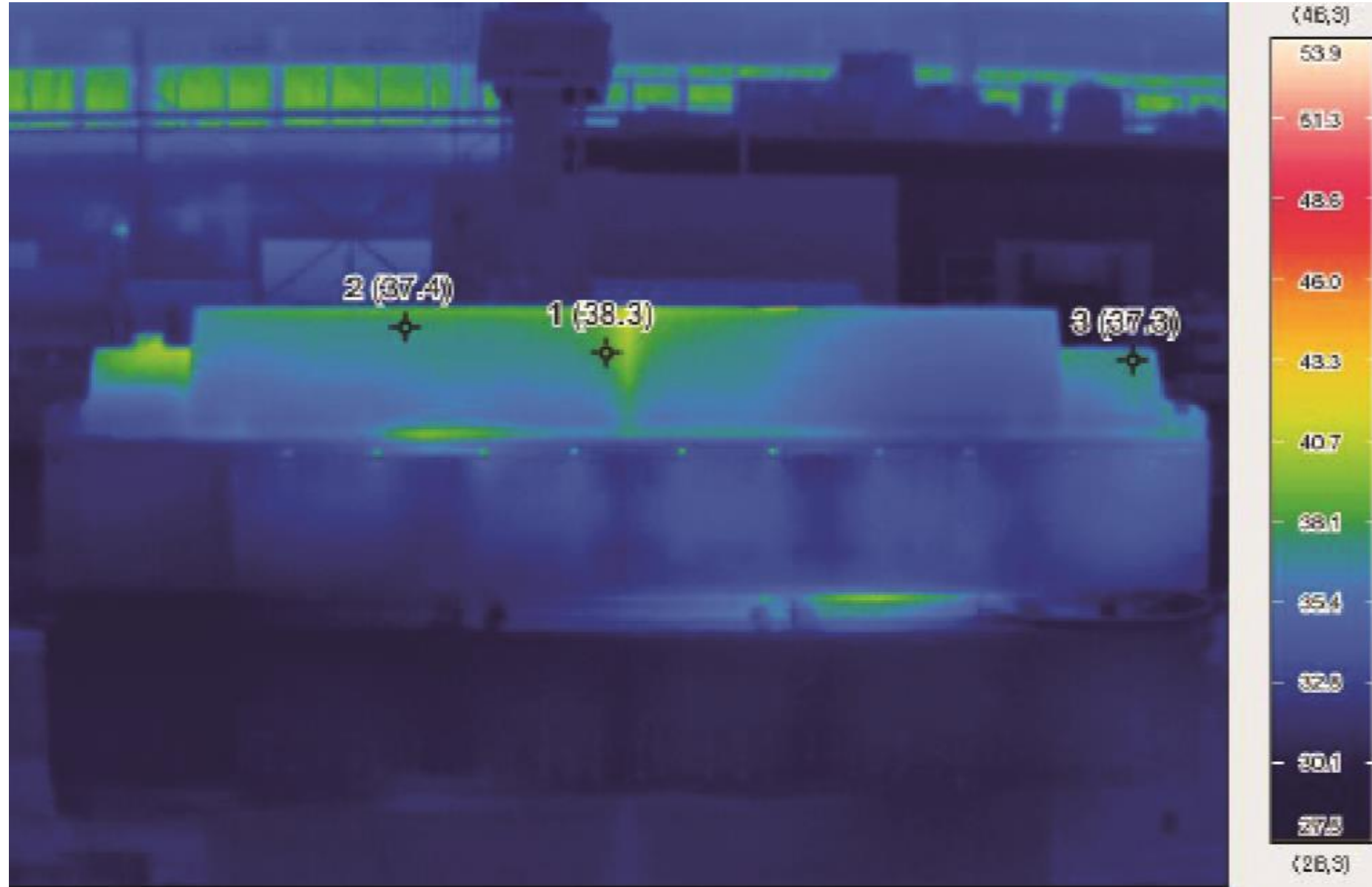
Equipped with the best-in-class high-power **Triple-sealed 300W blower motor** and specially-designed **Sheath heater**, TRA I-F reflow ensures the optimum heat distribution throughout multi-zone environment and realizes the minimal  $\Delta T$ , guaranteeing the outstanding temperature profile for the best solder quality.



# Excellent Thermal Insulation

Durable insulation structure of TRA I-F reflow oven maximizes the energy efficiency by keeping the heat stay inside the process tunnel and minimizing the heat loss and dispersion to outside oven.

The top quality thermal insulation material allows the surface temperature at the lowest level in the industry and delivers the best working environment for factory employees.

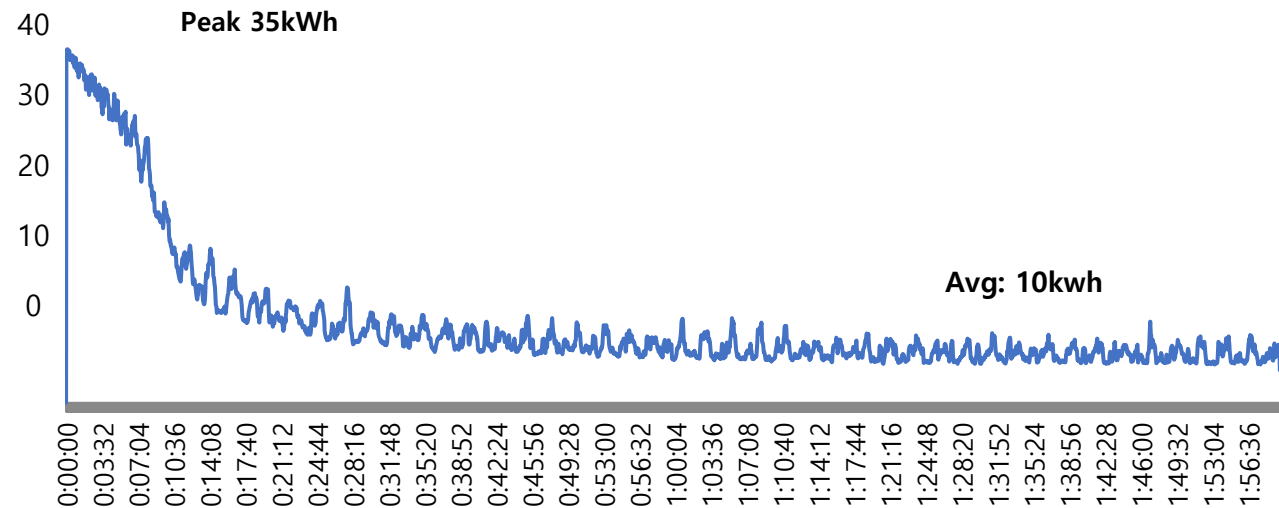


# Ultra Energy Saving

TRA I-F Reflow oven realizes the optimized temperature profile and highest process stability from lower power consumption.

- Low energy and high output Blower Motor
- High quality insulation materials keeping the heat inside process zone
- Partial Start-up
- 10 kW Power when stabilized (for TRA I-F82)

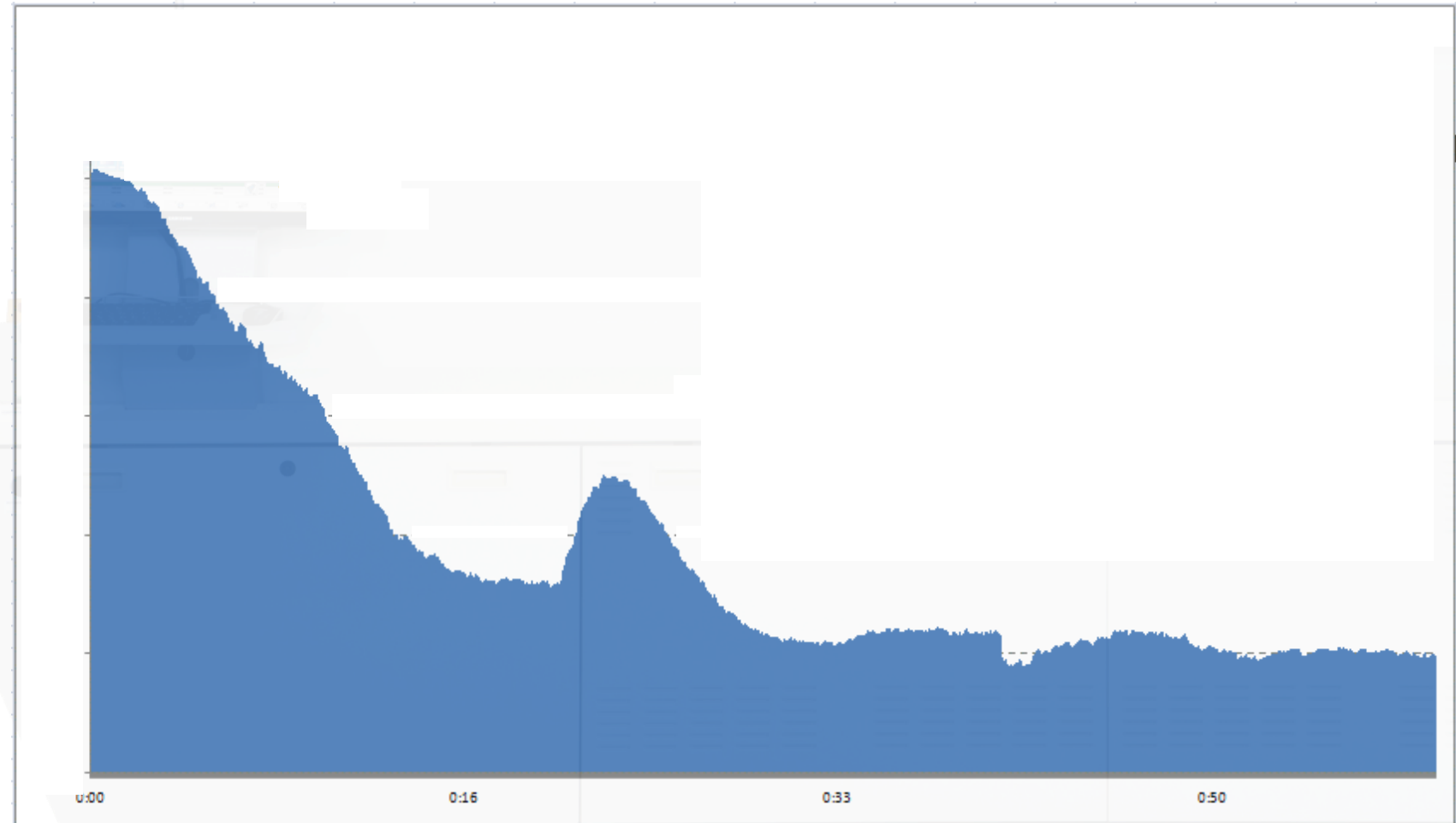
## Realize stable temperature profile even with lower power consumption



# Partial Start-up Mode

TRA I-F Reflow allows the **Partial start-up** by controlling the heater in 2 steps to minimize the electricity consumption for peak temperature, which feature **greatly saves the electricity cost** for those who want to run the factory at lower contracted power.

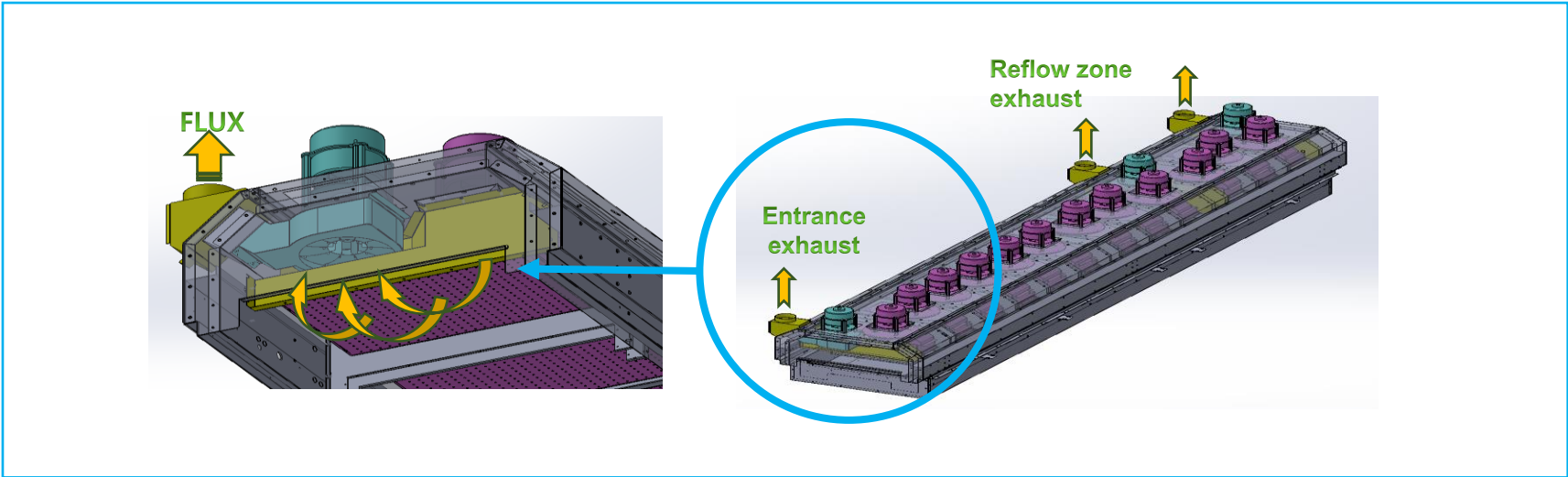
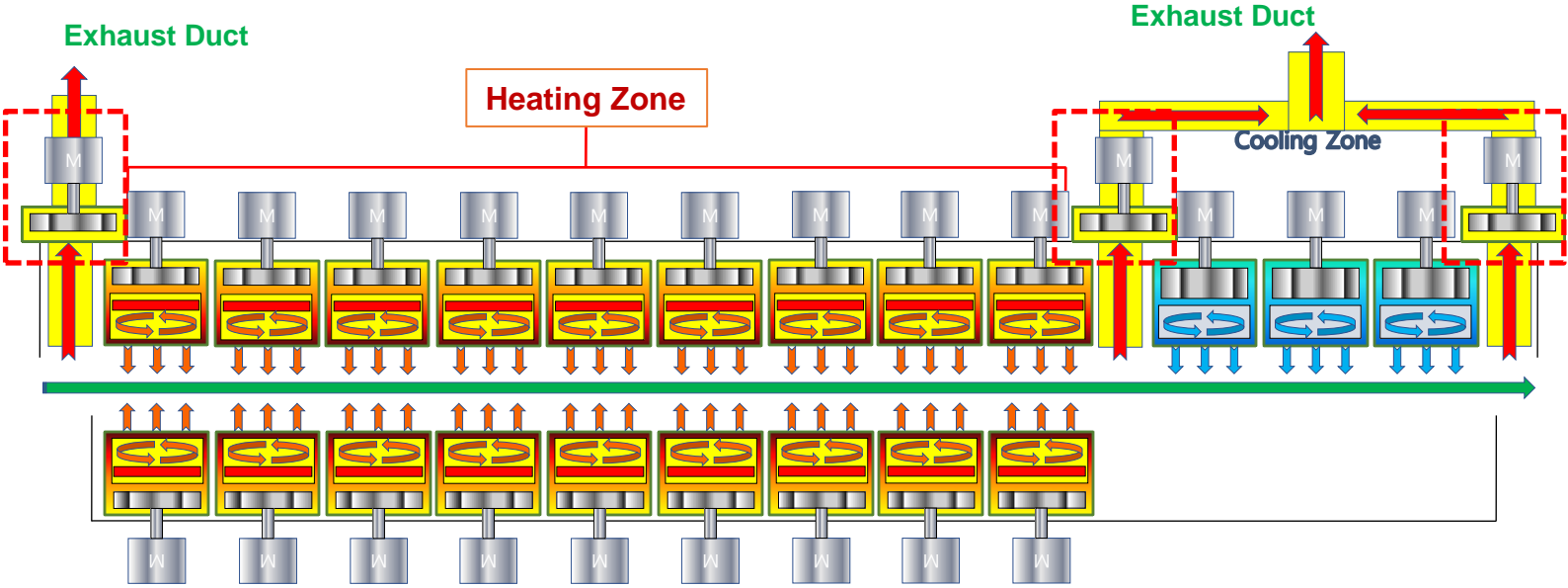
TRA I-F reflow also provides the **Weekly Timer feature** for automatic scheduled operation, contributing for energy efficiency.



# Efficient Flux Removal Structure

TRA I-F Reflow ensures to keep the process zone clean from the flux by exhausting the production residues from the entrance and exit area.

- Super-power blower motors deliver
- Highest exhaust capability
  - Longer lifespan under high temperature environment
  - Precise inverter control fitting the factory conditions
  - Less power consumption







**S/W**

**MMI**  
MAN MACHINE INTERFACE

**RTPM**  
REALTIME TEMPERATURE PROFILE  
MONITORING

# Intelligent & Intuitive

## Inhouse-engineered Software Package



### Easy to Operate & User Centered

TSM's intuitive MMI and monitoring software offers **clear visualization at a glance** for reflow process monitoring and user-centered easy operation. The prior alarm messages for crucial check-points for the timely machine maintenance minimize the machine downtime.

Whole reflow processes are monitored and remotely-controlled intelligently not only from PC monitor but also from central server or even smartphone.

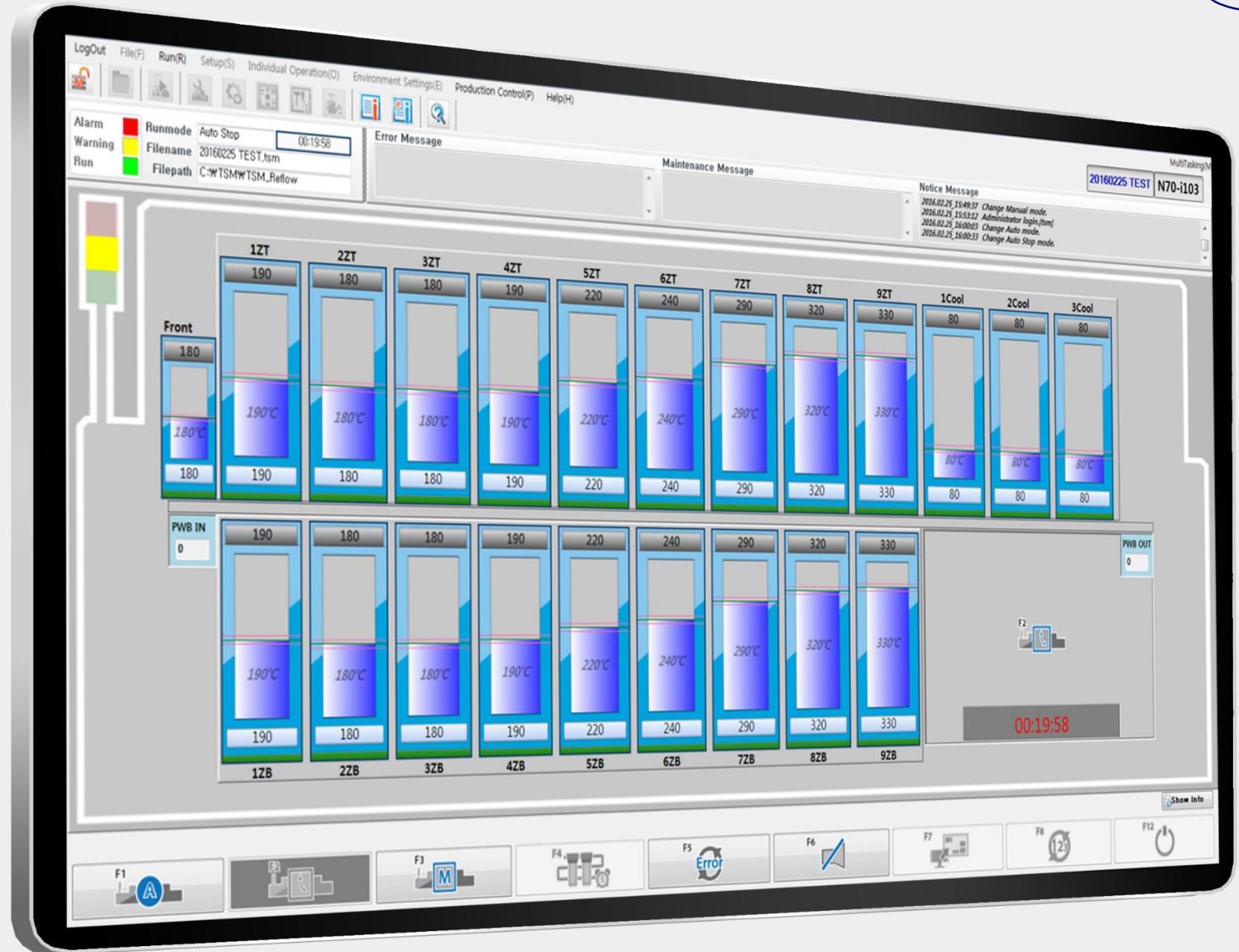
TSM software is designed and developed by inhouse S/W development division. TSM is able to deliver **the customized software solutions** for customer's Database and customers production system

# Intuitive MMI

## Easy to Operate & User-Centered

Intuitive menu interface and **infographic UX design** enables users to monitor the whole process of Reflow inside at a glance.

**Alarm messages** related to the machine maintenance can be pre-set up to **10 check-points** and maximizes the longest stable production uptime.



# Quality Management

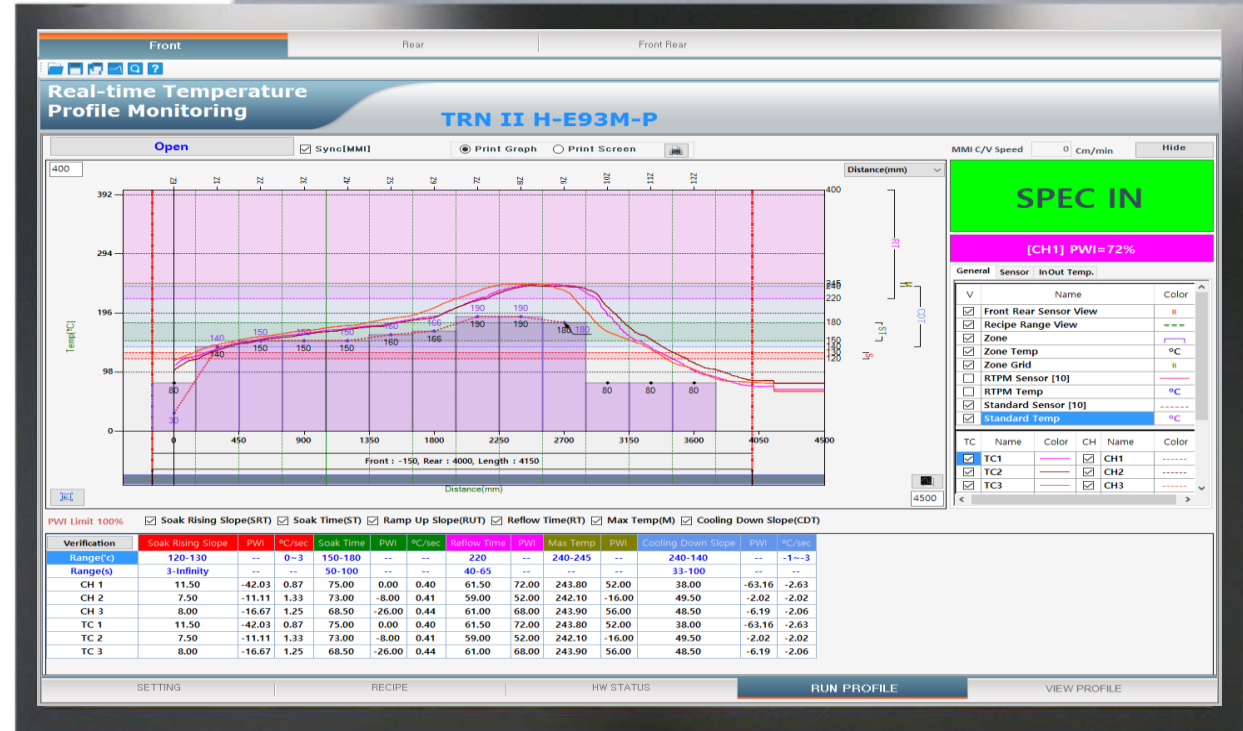
## RTPM

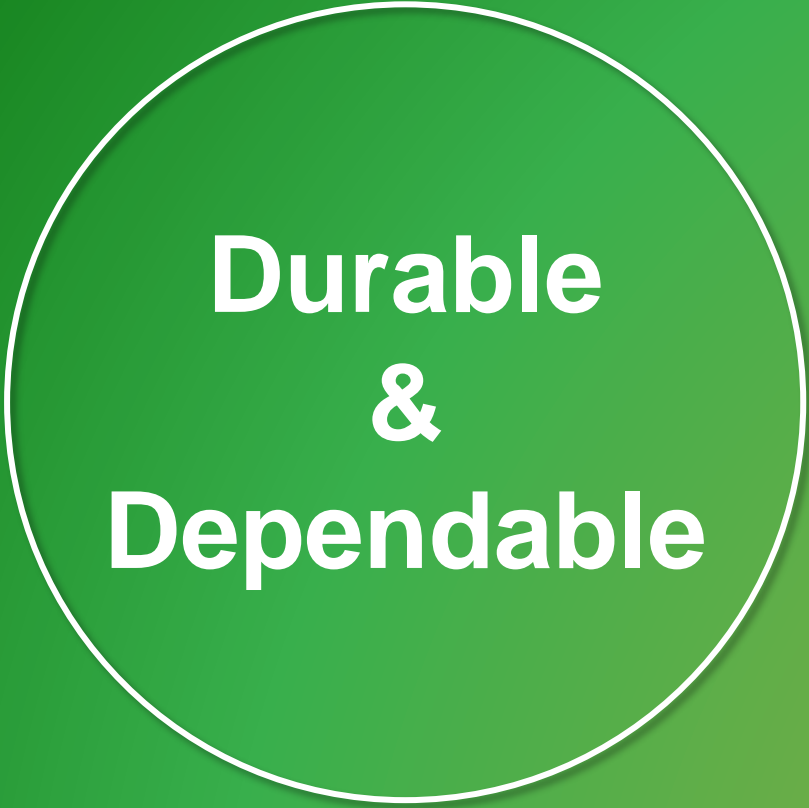
Realtime Temperature Profile Monitoring System RTPM

RTPM provides the real-time temperature information of each zones on screen to ensure quality monitoring. RTPM also logs the temperature profile database of each production board model and enables excellent process traceability(with Barcode option) of each board by recalling the temperature profile which has been recorded previously, minimizing machine down-time.

### OPTION

Basic Sensor Type, Wired Sensor Type





**Durable  
&  
Dependable**



Most **Durable & Dependable**  
ever Built



## Class-different **Durability**

TSM Reflow ovens are most dependable and reliable. TSM use only world-best proven core components for the control unit. TSM's reflows are designed and structured in specially-developed material to prevent thermal deform, guaranteeing industry's best durability and reliability.

TSM's innovative conveyor system ensures the optimum grip & fail-free transport of PCB from bent, fall and jammed issues.

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# Most Durable

## Specially-treated **anti-corrosion** Perforated **Stainless Steel** Plate

Inside oven is made of specially-treated perforated **Stainless steel** to prevent metal rust and undesirable adsorption of contaminated flux residue onto the perforated metal plate.





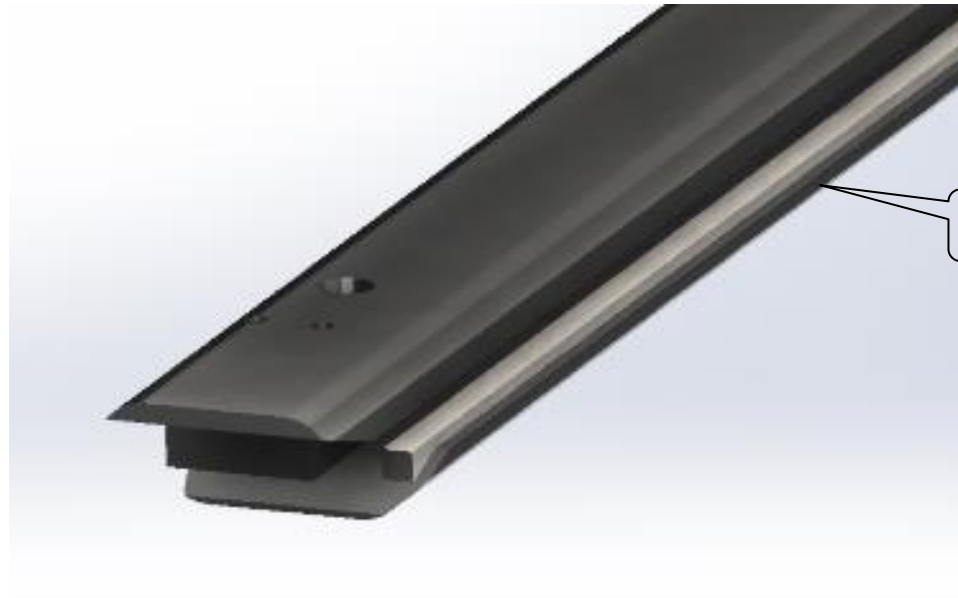
# Most Durable

## Enhanced Rail Durability

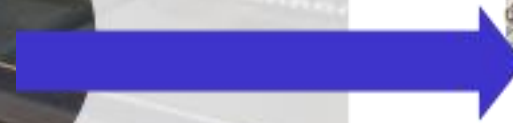
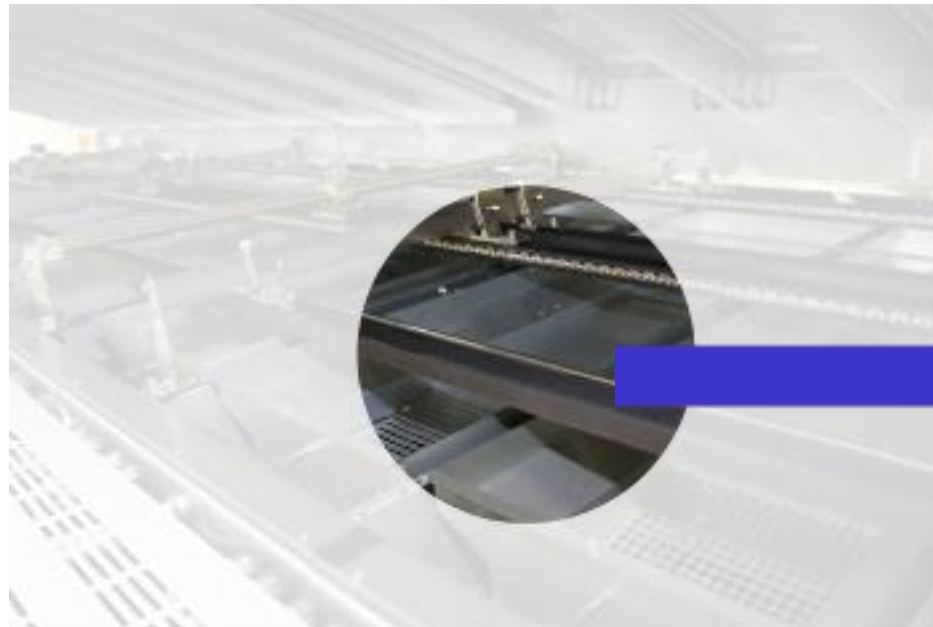
The specially-treated SUS Support Bar is additionally built-on to prevent the friction and the wear between rails and conveyor chains, which prevents unwanted PCB drop from the conveyor by reducing the sagging of conveyor chains.

## Minimal $\Delta T$ Inside Open Temperature

Specially heat-treated compact-sized rails minimizes  $\Delta T$  within a zone and significantly lower the rail deformation from long-time heating.



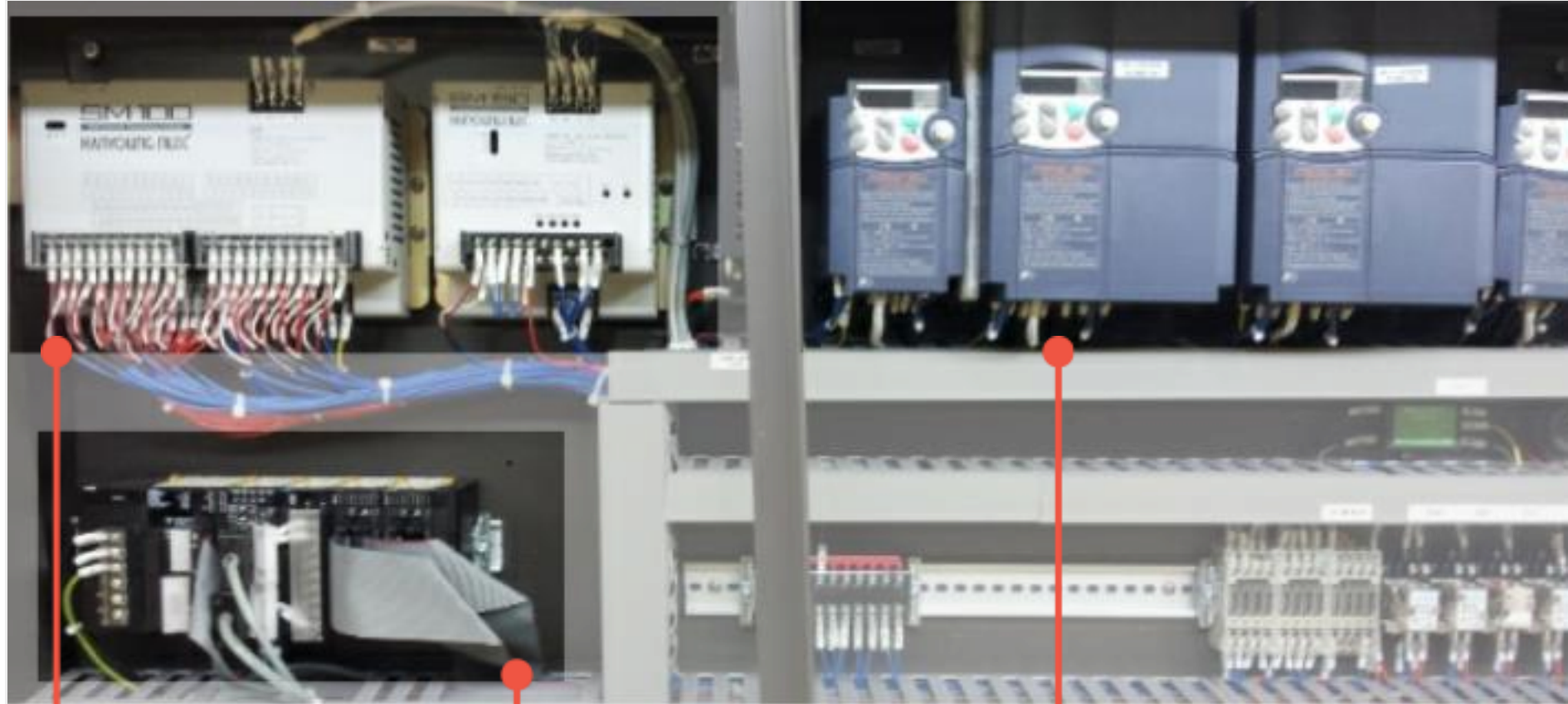
SUS Support Bar



# Most Dependable

## High Performance Control Unit

TRA I-F Reflow is highly reliable, highly stable and highly competent. Control Unit and core components are built-up by only world-best proven components and its modular structure allows the minimum downtime by easily replacing faulty parts.



**CONTROLLER**  
Auto Tuning,  
Time Proportional PID  
Control  
Individual Monitoring by S/W

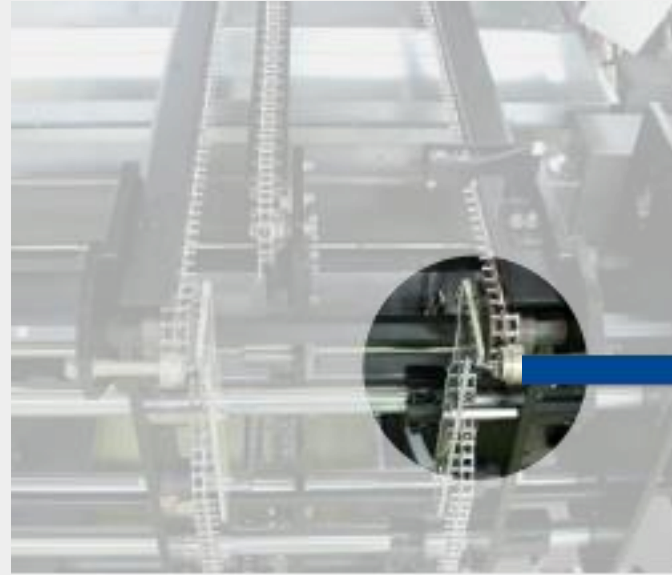
**OMRON PLC**  
Proven renowned Quality

**FUJI INVERTER**  
Fan speed control in Heating zone and Cooling zone  
Preventing fine pitch ICs blown by fan  
Blow motor RPM control by PC MMI program

# Most Dependable

## Thermal Deformation-free Chain

The chain is made of top-grade specially alloyed metal to prevent the thermal deformation, ensuring the safe board transfer without sagging or drop.



## Conveyor Chain Lubricator Level Sensor System (Option)

The Conveyor chain oil level system monitors the lubricator level and sends the alarm message when the level goes down below preset level, ensuring the lifespan of conveyor chains.

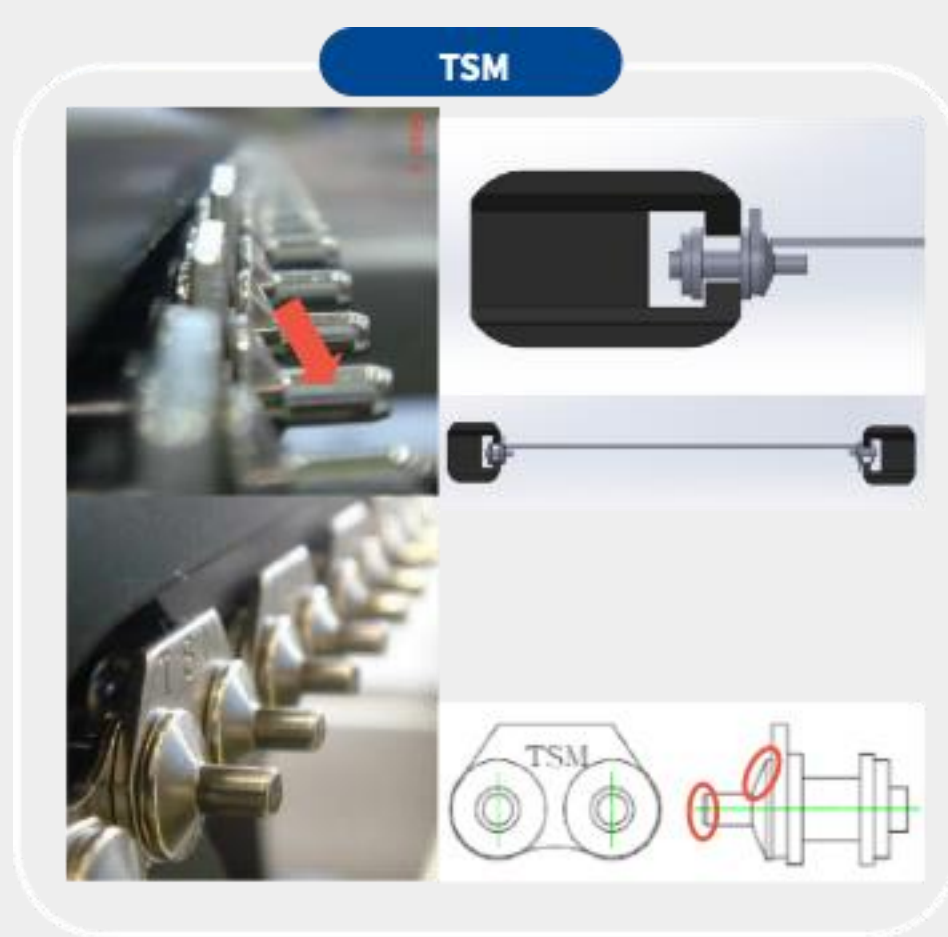




# Most Dependable

## Board Jam Prevention Chain Structure

Board Jam with Chain issues are remarkably reduced by introducing tilting angle between chain and pin. The self-alignment feature enhances the production yield.



**VS**

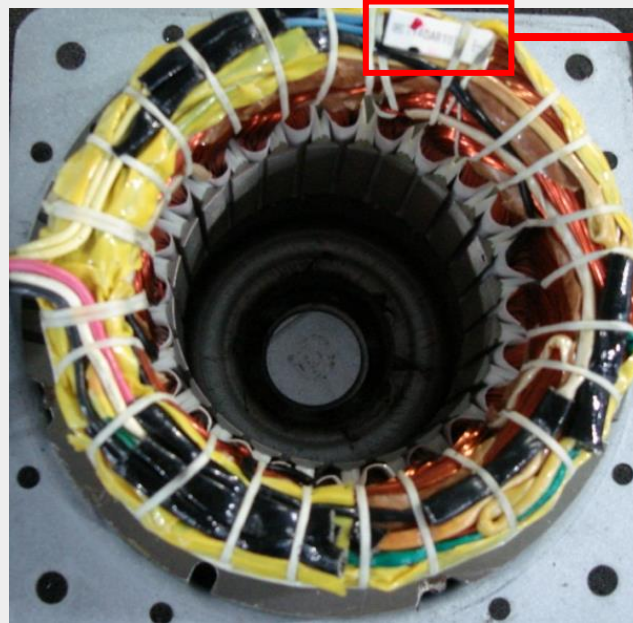


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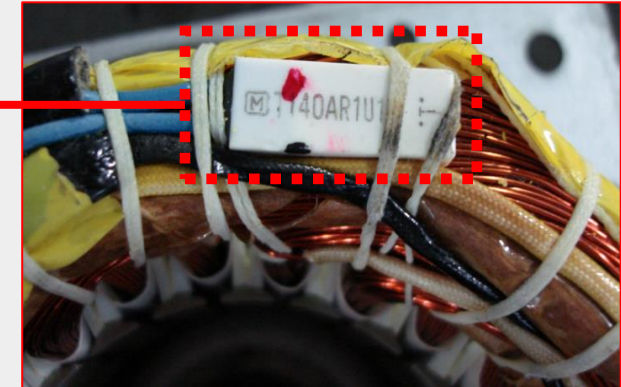
# Most Dependable

## Safety and prevention (Blower Motor)

Robust blower Motor is protected by overheat detection sensor which contributes no downtime of production line.



Overheat Detection Sensor



- Blower Fan Motor of world-class qualified in quality and performance
- Overheat Detection Sensor
- Less failure rate and higher productivity guaranteed
- Operating at 140°C



**SPECIFICATION**

# SPECIFICATION

MODEL	TRA I-F61S	TRA I-F71	TRA I-F82S	TRA I-F82	TRA I-F92	TRA I-F103	TRA I-F123	Remarks
PCB Size (MM)	50 ~ 460 (500MM OPTIONAL)							
Total Heating Length (MM)	1,600	2,000	2,200	2,590	2,900	3,210	3,830	
Heating Zones	7	7	8	8	9	9	12	
Cooling Zones	1	1	2	2	2	3	3	
Chain (ATT SYS Chain)	O	O	O	O	O	O	O	
Conveyor Speed	0.3 ~ 1.6M / MIN							
Conveyor Type	CHAIN + Optional CBS (Anti-warp or Mesh)							CBS : Center Board Support
PCB Counter	Yes							
Self Diagnosis	Message Alarm							
PCB Clearance (TOP/BOTTOM) (MM)	32/22							
Cooling Type	AIR Cooling							
Control Type	PC Control							
Monitor	LCD Monitor							
OS	WINDOWS 8							
Blower Fan Inverter Control	O	O	O	O	O	O	O	
Conveyor Width PC Control	OPTION							
PLC Kit	O	O	O	O	O	O	O	
Temperature Kit	O	O	O	O	O	O	O	
Power Supply	3P 380V OR 220V (50/60HZ)							Various Power Option available
Air Supply	5 KG/CM <sup>2</sup>							
Peak Power (Standard Start / Partial Start)	30KW/21KW	30KW/21KW	34KW/24KW	34KW/24KW	36KW/25KW	38KW/27KW	60KW/42KW	
Power Consumption in Stable Operation	10KW	10KW	10KW	10KW	11KW	11KW	13KW	
Weight (KGS)	1,220	1,550	1,650	1,780	1,950	2,200	2,400	
Dimension Length (MM)	2,600	3,330	3,620	4,080	4,700	5,010	5,630	1,420 W x 1,550 H (in common)

# Thank You !

