

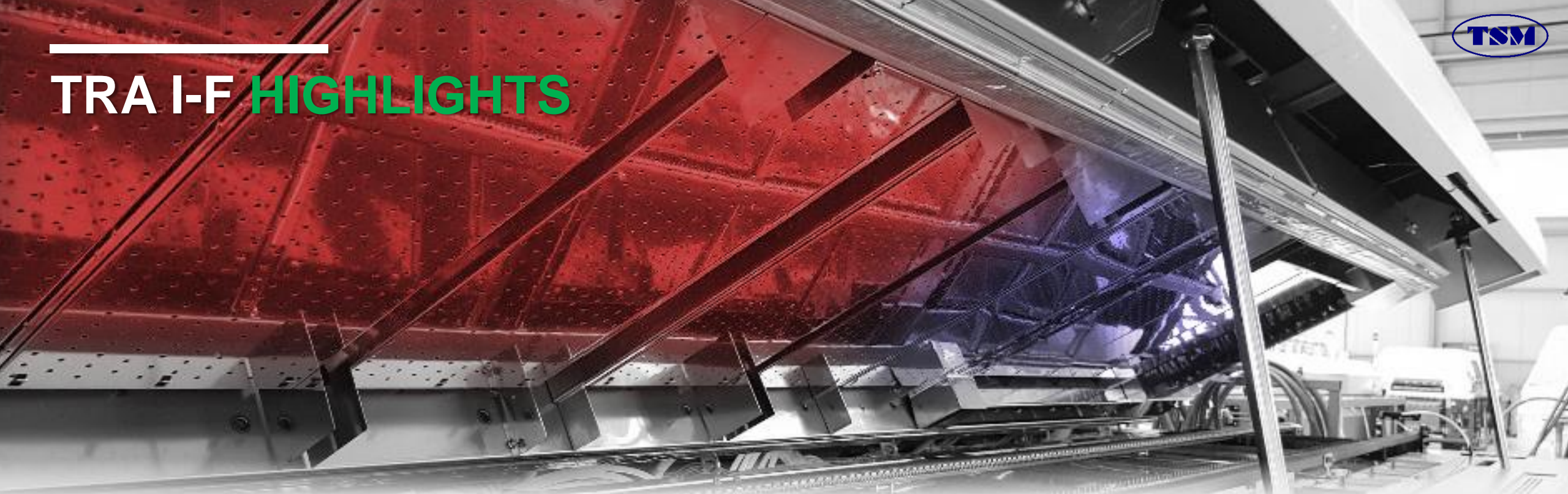


TRA I-F SERIES

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

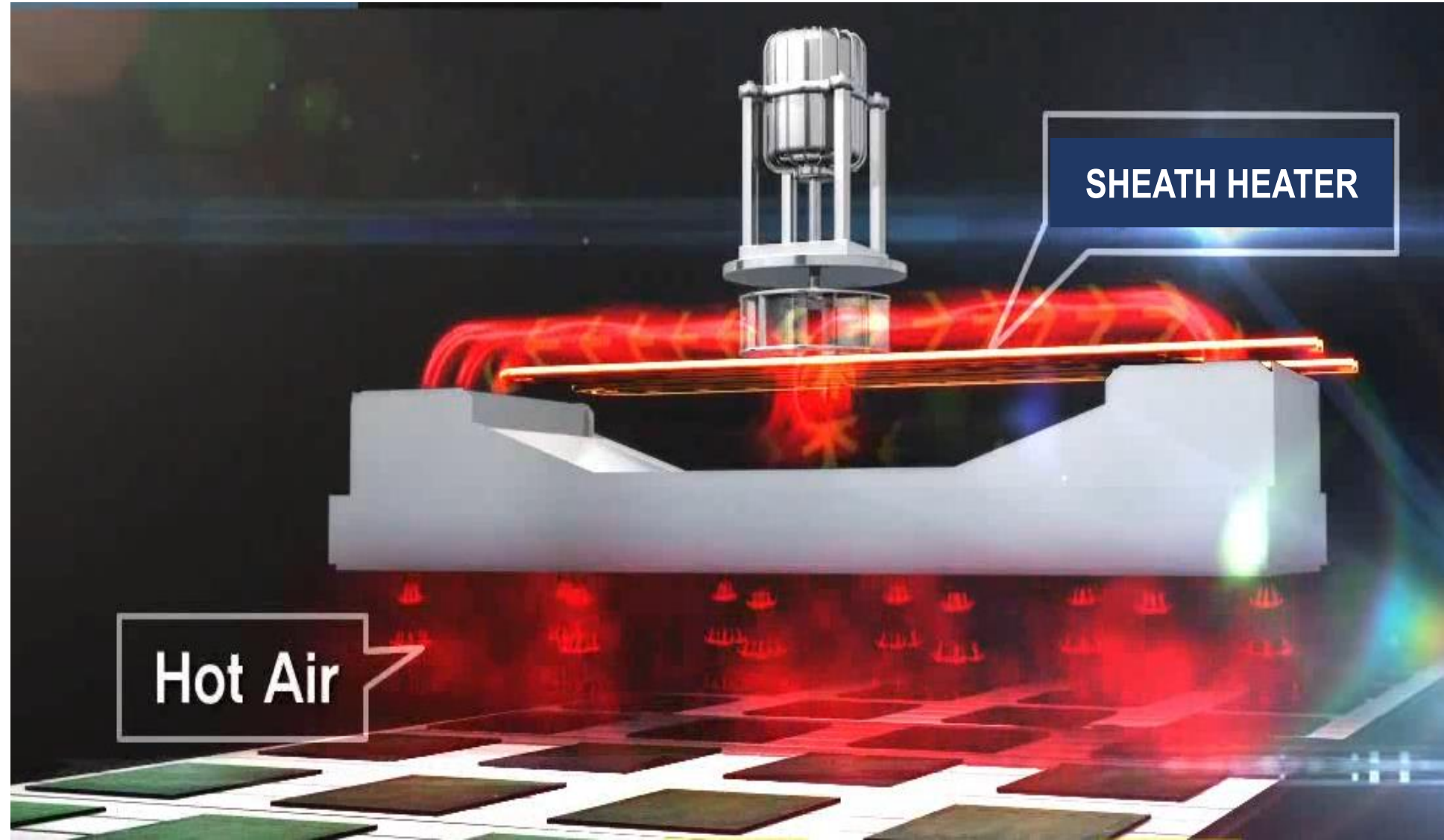
- Rust-free Stainless steel plate
- Best-in-quality Controller Unit from Internationally renowned brand
- Failure-free Maintenance Alarm Messages
- Board-jam prevention Chain Design
- Highly capable Blower Motor



**SMART ENERGY
SAVING**

Highly Efficient Heat Transfer

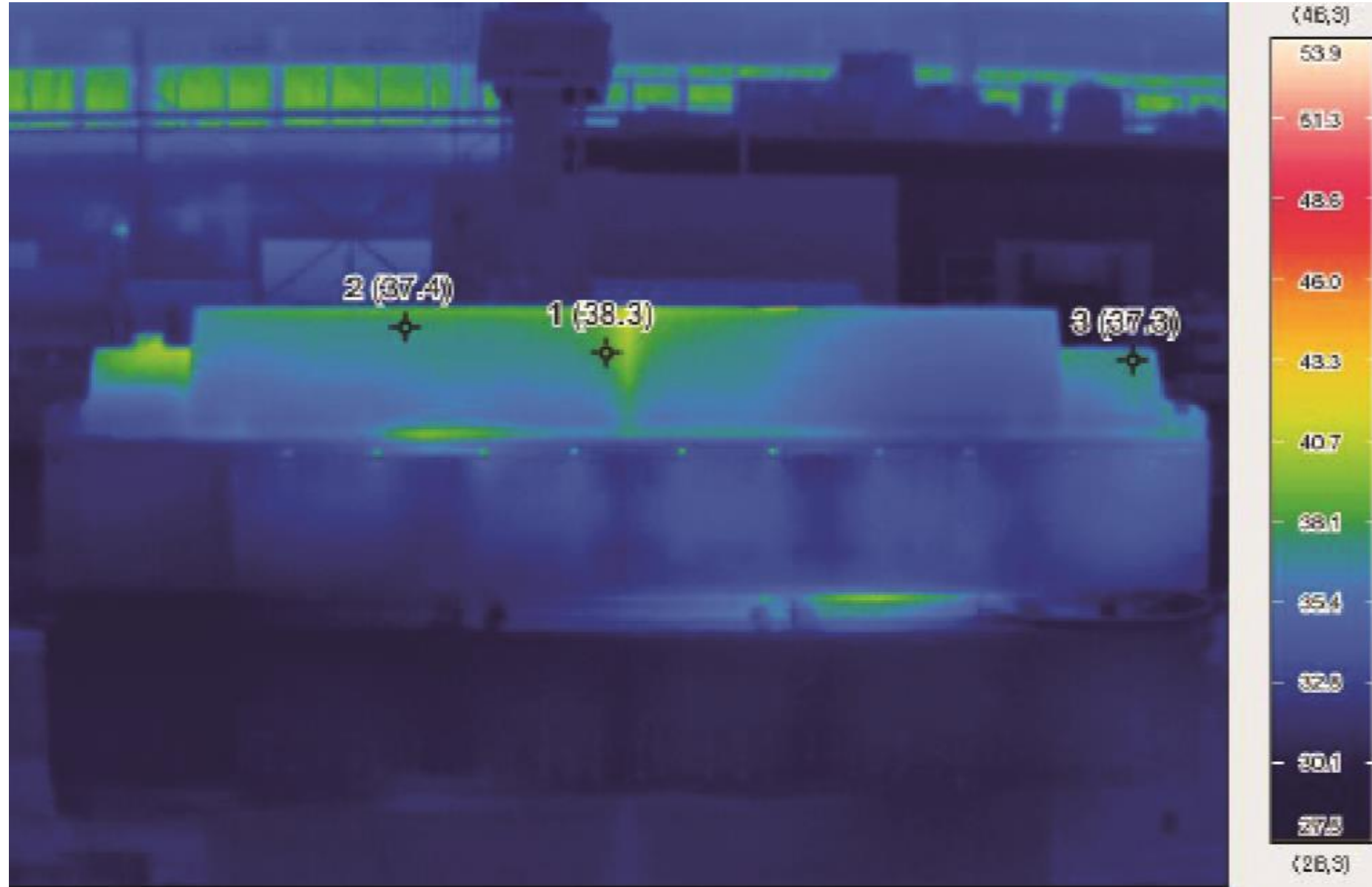
Equipped with the best-in-class high-power **Triple-sealed 300W blower motor** and specially-designed **Sheath heater**, TRA I-F reflow ensures the optimum heat distribution throughout multi-zone environment and realizes the minimal ΔT , guaranteeing the outstanding temperature profile for the best solder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

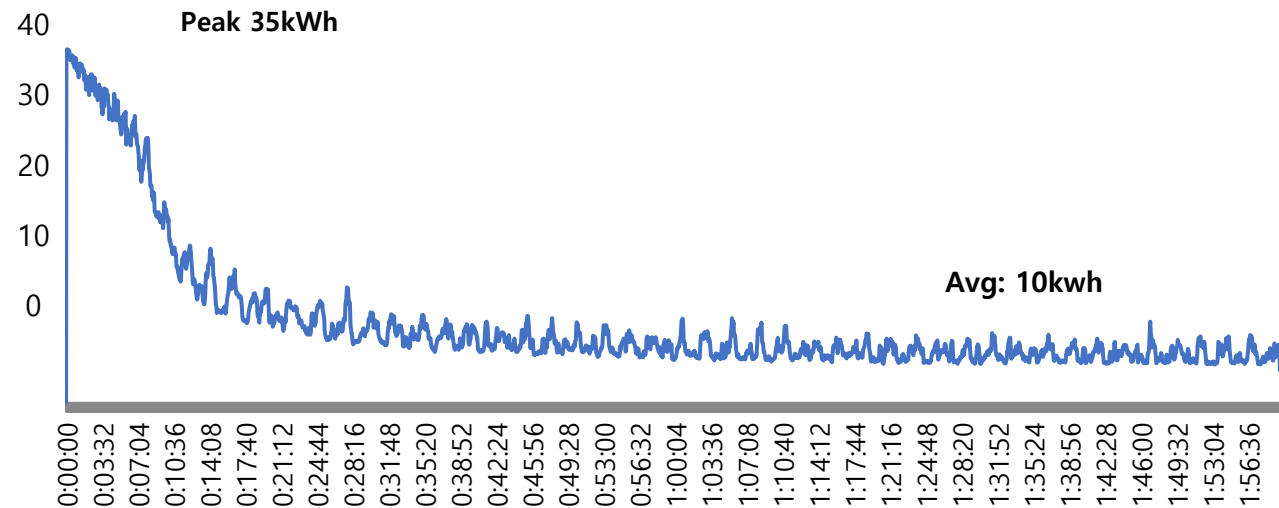


Ultra Energy Saving

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)

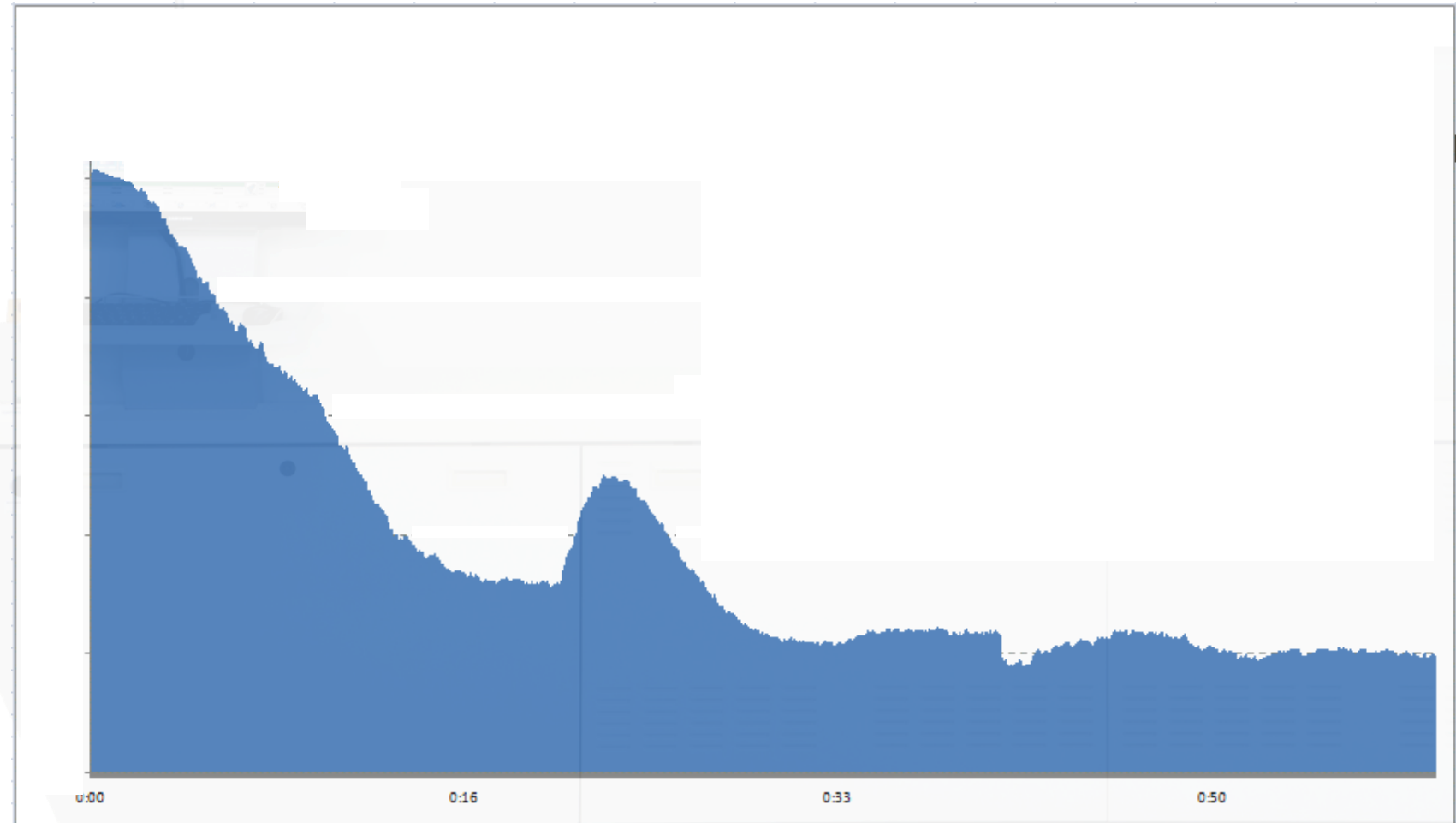
Realize stable temperature profile even with lower power consumption



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.

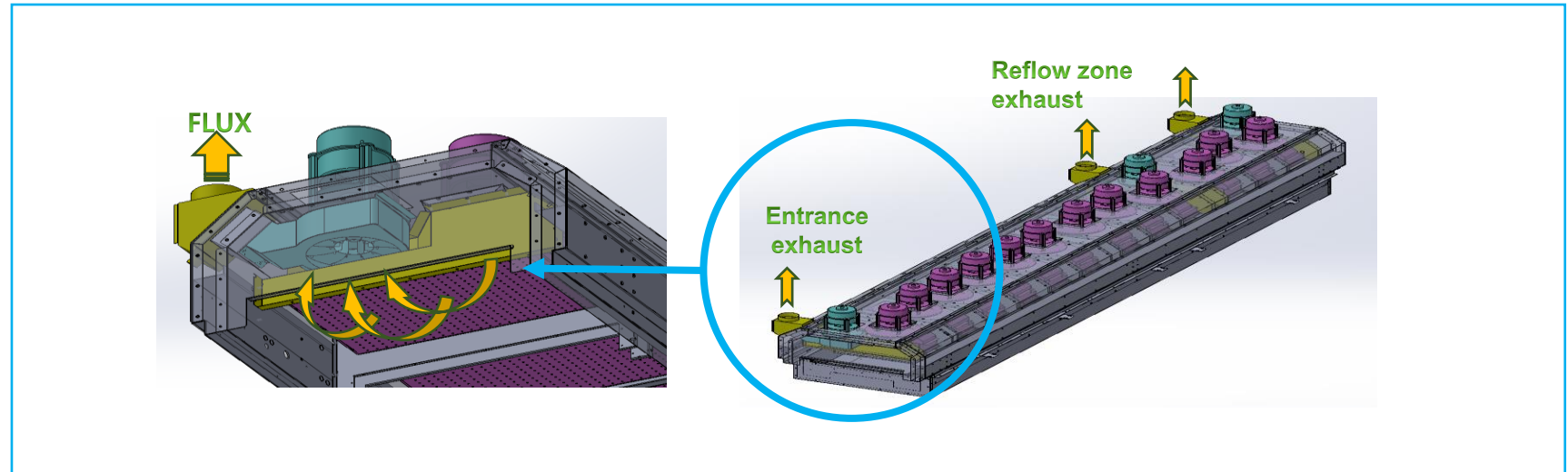
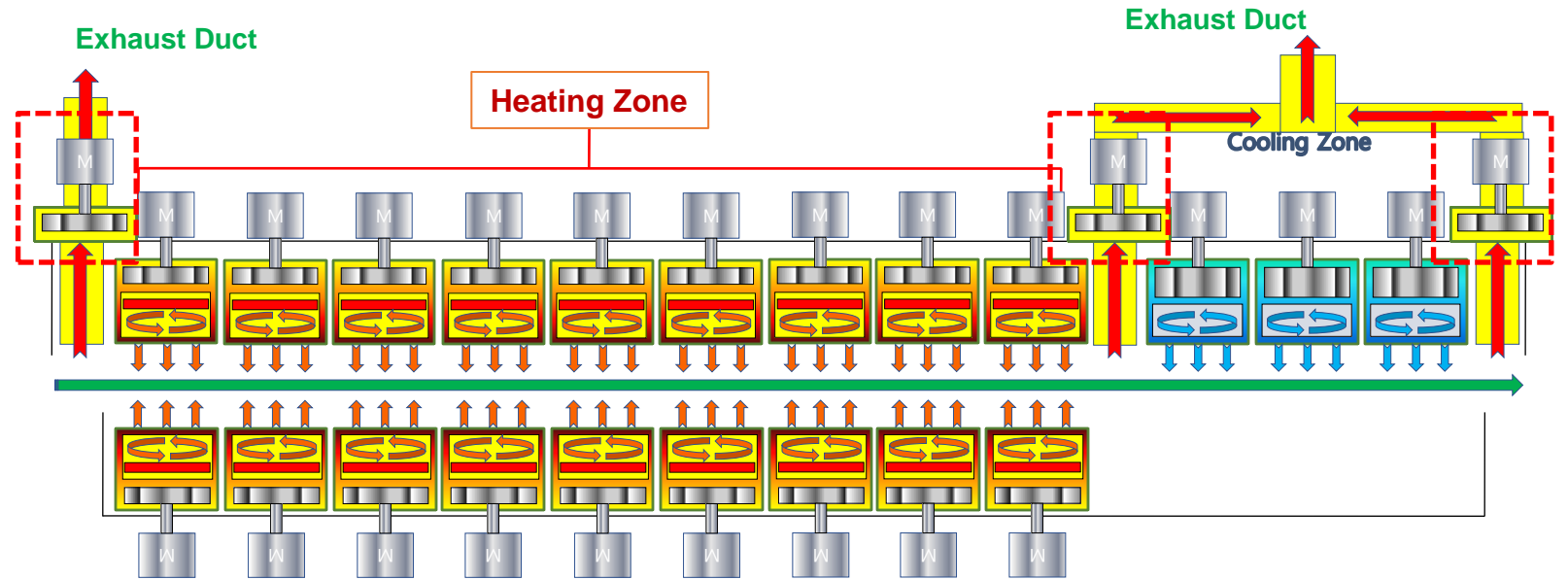


Efficient Flux Removal Structure

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.

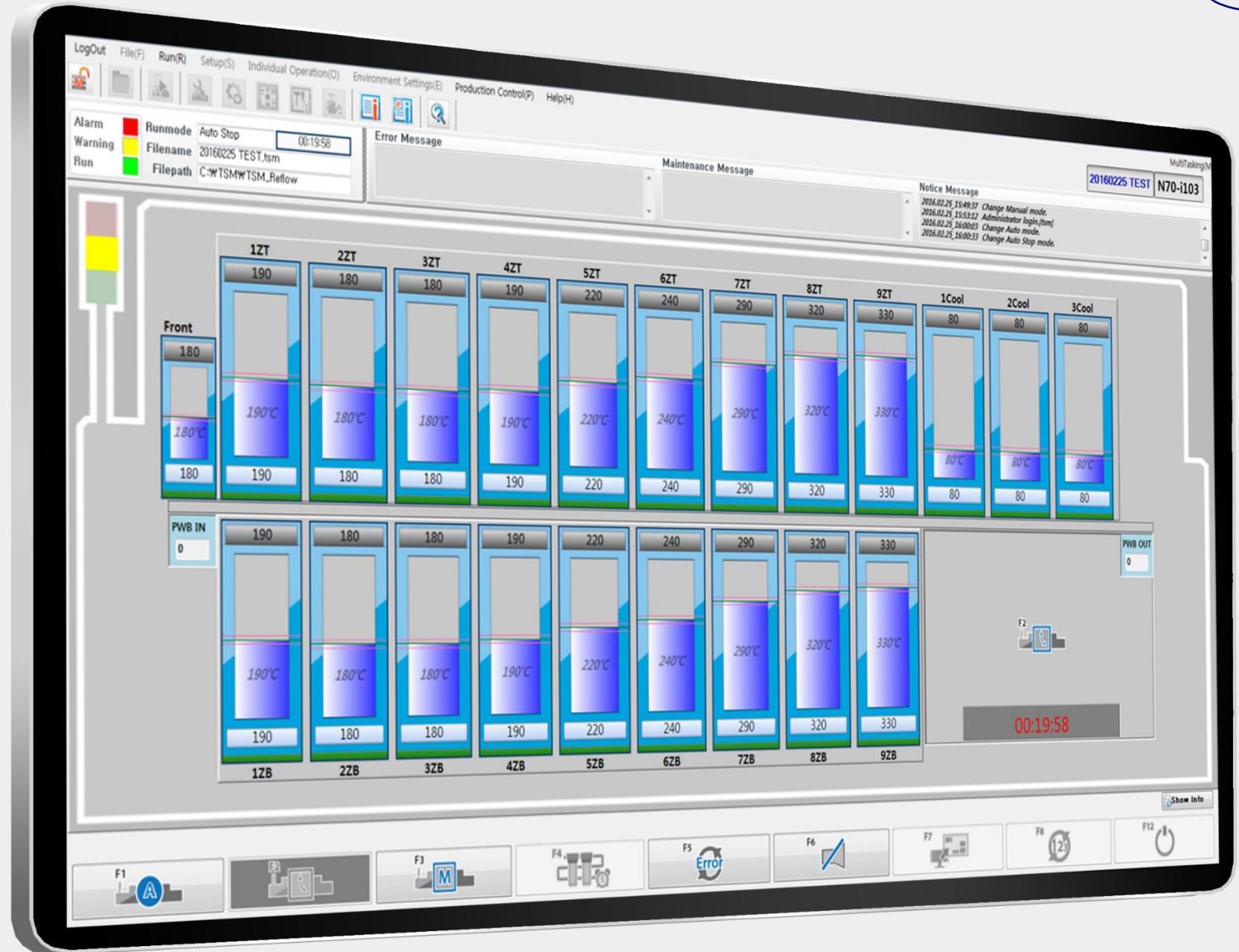
TSM software is designed and developed by inhouse S/W development division. TSM is able to deliver **the customized software solutions** for customer's Database and customers production system

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

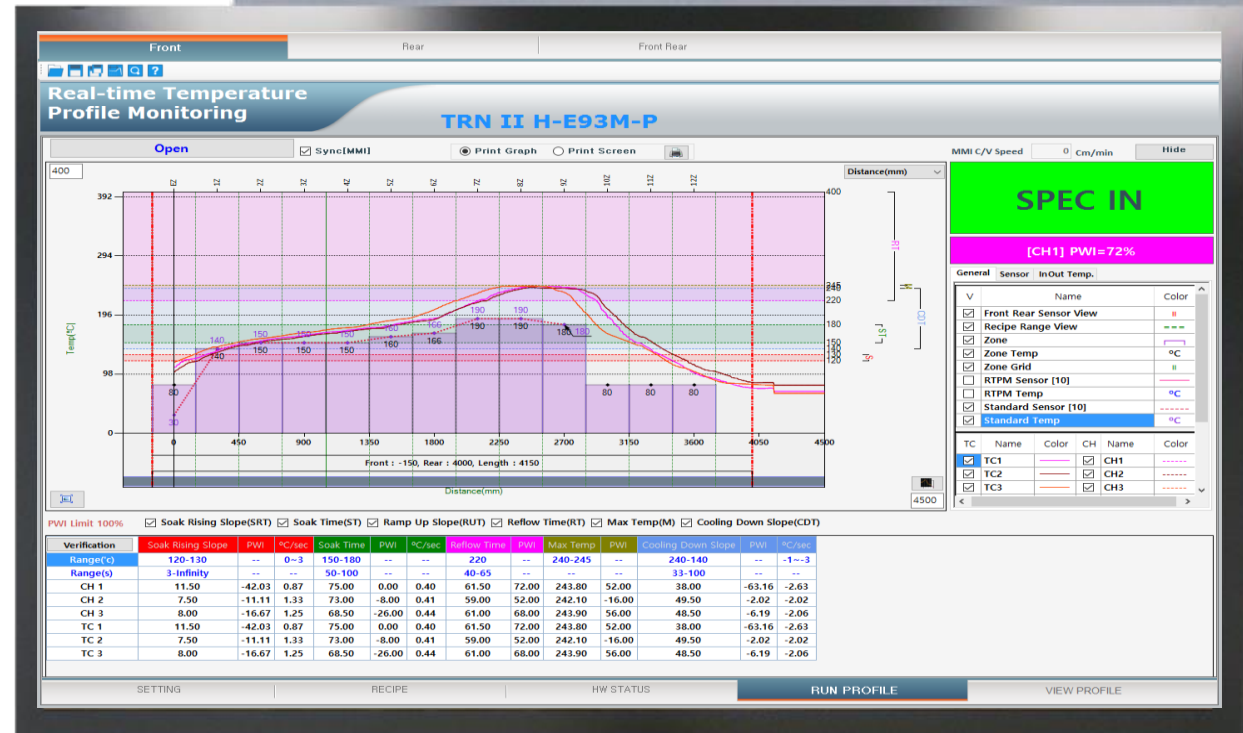
RTPM

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.

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.



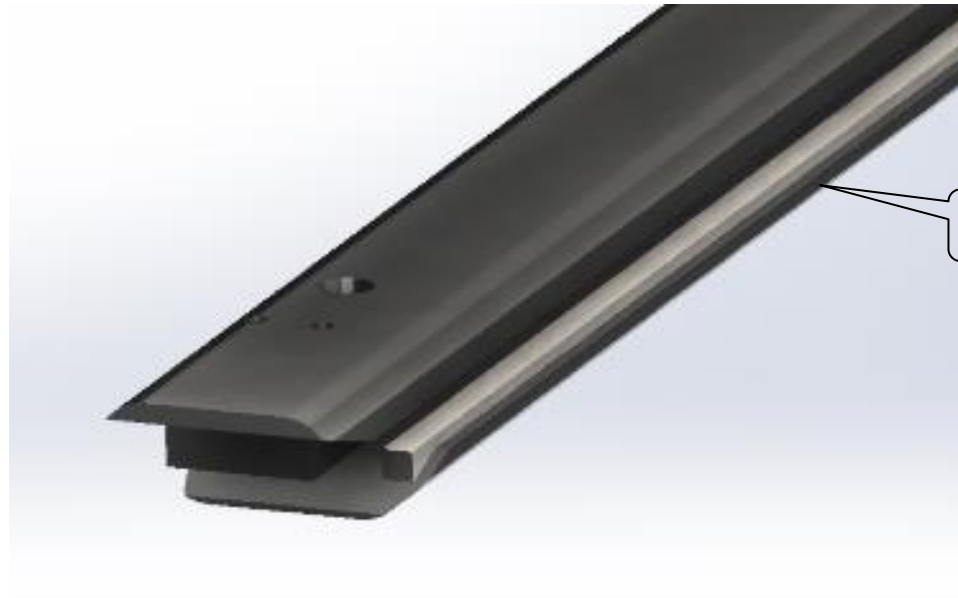
Most Durable

Enhanced Rail Durability

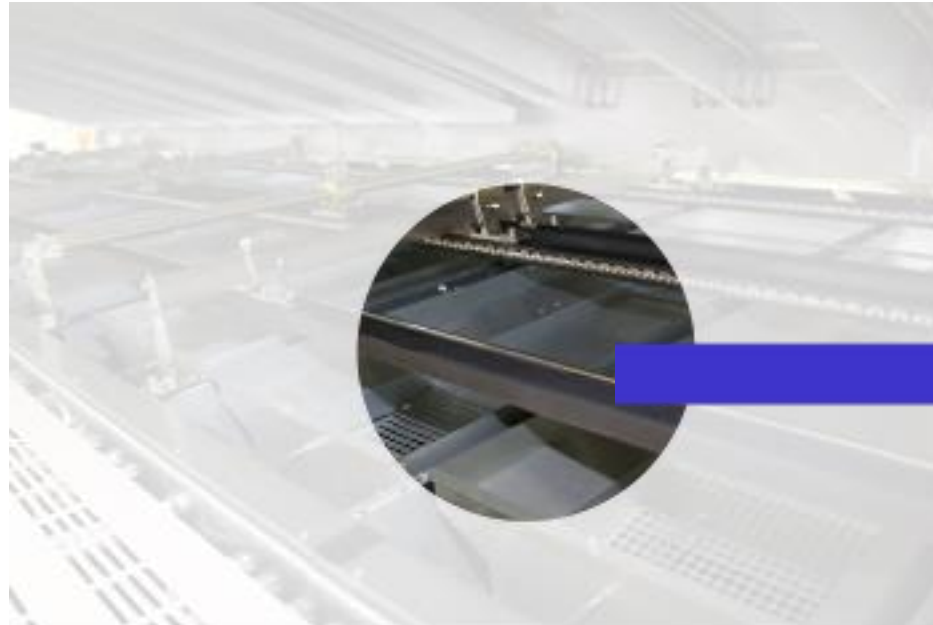
The specially-treated SUS Support Bar is additionally built-on to prevent the friction and the wear between rails and conveyor chains, which prevents unwanted PCB drop from the conveyor by reducing the sagging of conveyor chains.

Minimal ΔT Inside Open Temperature

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



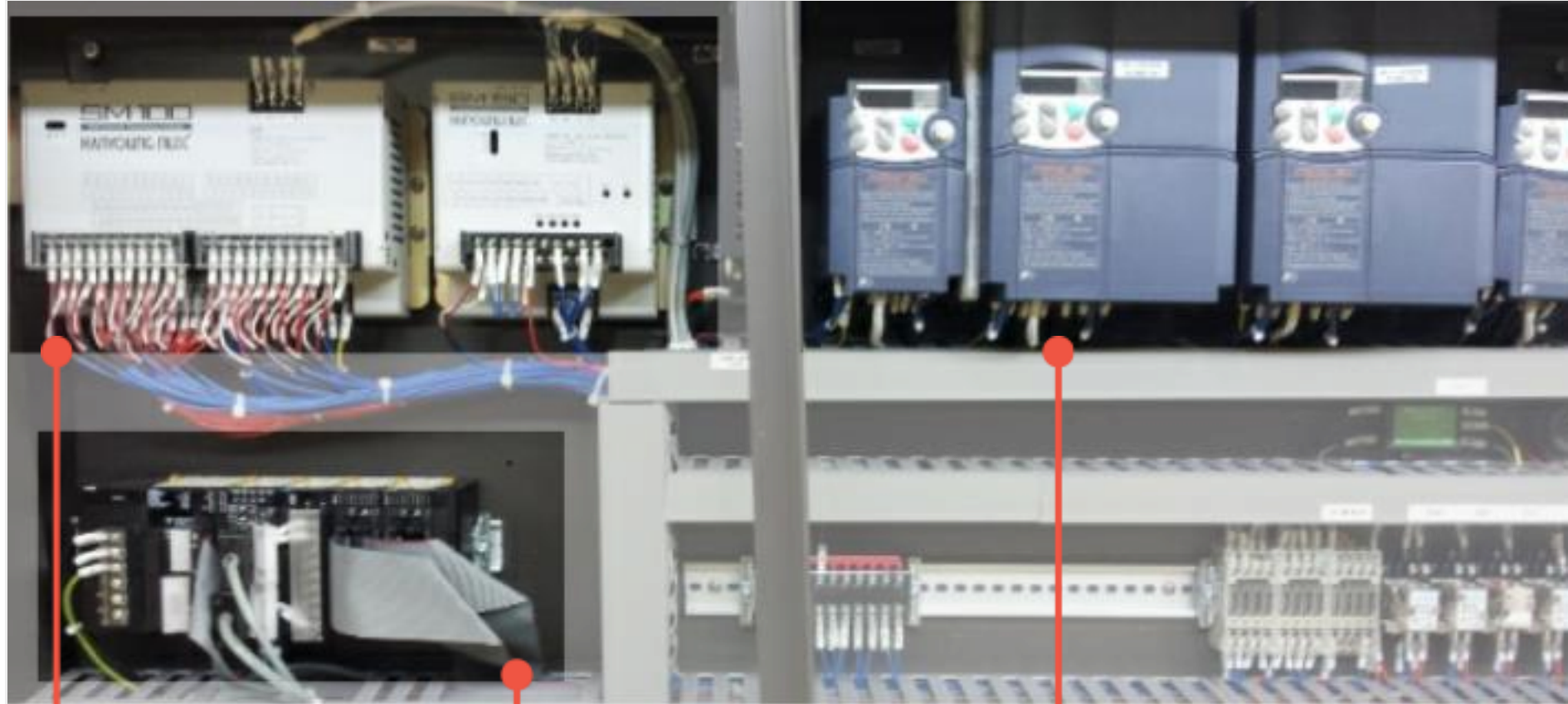
SUS Support Bar



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

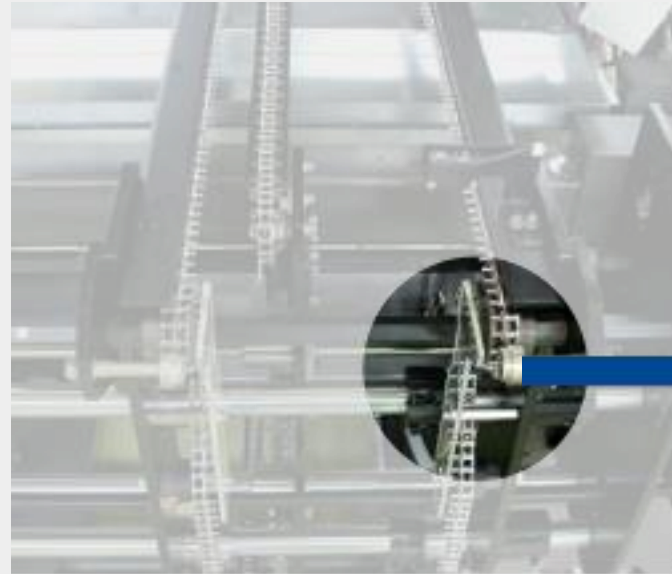
OMRON PLC
Proven renowned Quality

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)

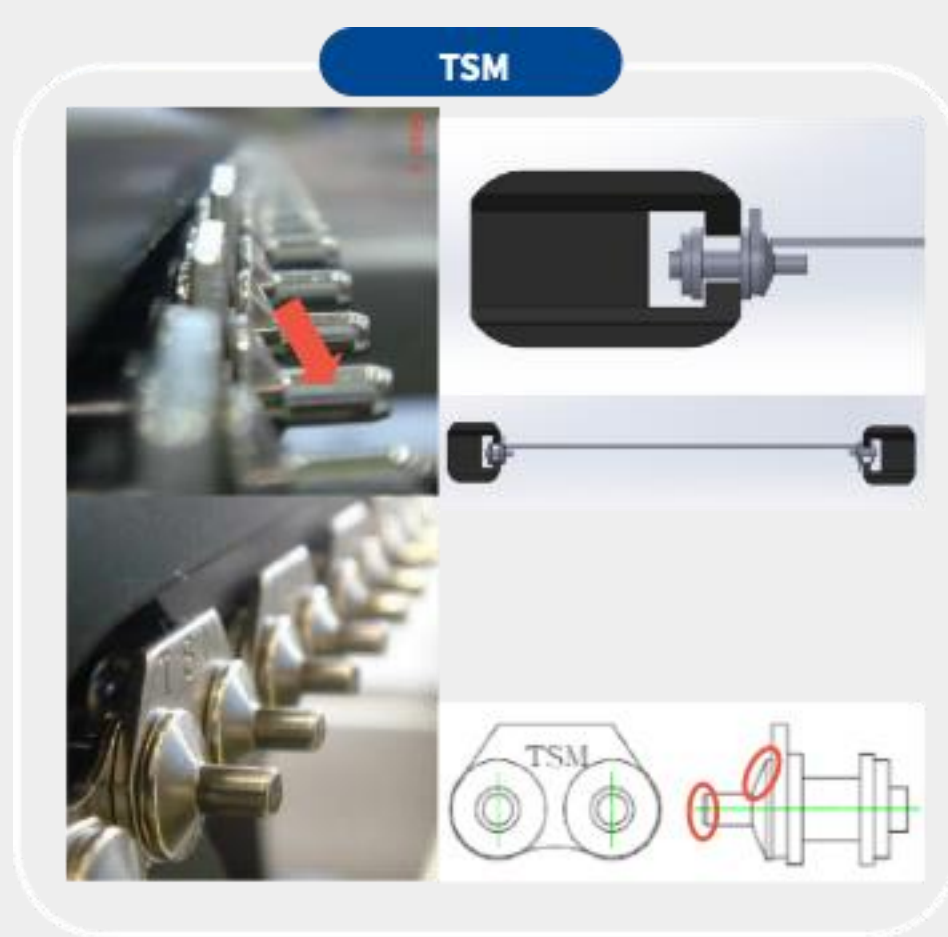
The Conveyor chain oil level system monitors the lubricator level and sends the alarm message when the level goes down below preset level, ensuring the lifespan of conveyor chains.



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.



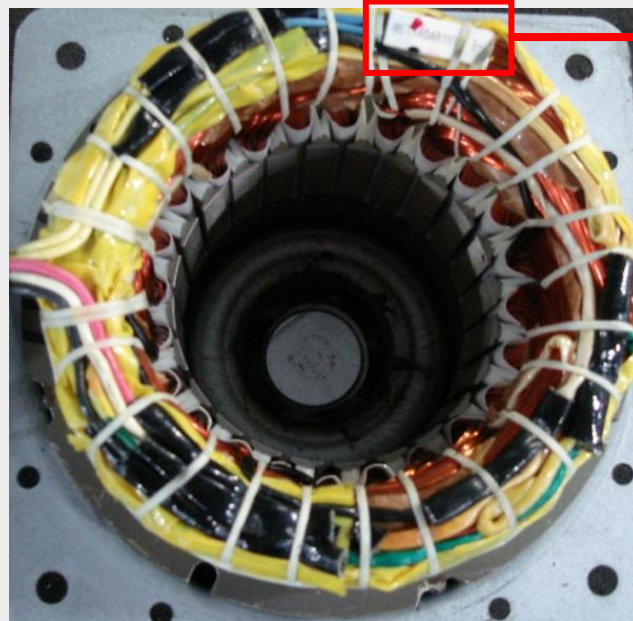
VS



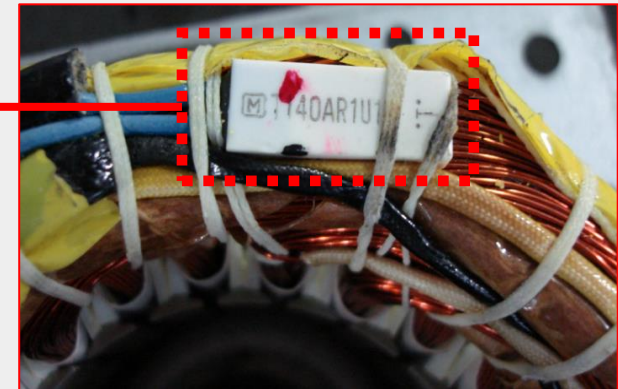
Most Dependable

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

MAKER BRAND SERIES MODEL	TSM						Remarks
	TRA I-f Series (Air type)						
	TRA I-f71	TRA I-f82S	TRA I-f82	TRA I-f92	TRA I-f93	TRA I-f123	
PCB SIZE	50 ~ 460						Standard
TOTAL HEATING LENGTH	2,000	2,190	2,590	2,900	2,900	3,840	
One Heating Zone Length	310	258	310	310	310	310	
ON-LOAD LENGTH	900±20						
OFF-LOAD LENGTH	900±20						
Heating Zones in TOP	7	8	8	9	9	12	
Heating Zones in BOTTOM	7	8	8	9	9	12	
Cooling Zones	1	2	2	2	3	3	
Chain (Att SUS Chain)	○	○	○	○	○	○	
Conveyor Speed	0.3 ~ 1.6 M/min						
Conveyor Type	CHAIN + option (ANTI or Mesh)						ANTI/Mesh option
Repeatability	± 1 'C						
Temperature Accuracy	± 1 'C						
SET_UP TIME	30 - 40 min						
Profile Change Time	15 - 30 min						
PCB COUNTER	Yes						
Profile function	OP						
Self diagnosis	Message Alarm						
PCB height(top/bottom)	25/20						Mesh only : 40
Cooling type	Air cooling						
Control type	PC Control						
Monitor	LCD Monitor						
Software	Windows 8						
Blower fan inverter Control	○	○	○	○	○	○	
Conveyor width PC Control	OP	OP	OP	OP	OP	OP	
Conveyor driving inverter Control	○	○	○	○	○	○	
PLC KIT	○	○	○	○	○	○	
Temperature KIT	○	○	○	○	○	○	
POWER SUPPLY	3P 380 or 220(50/60Hz) or others						on demand
AIR pressure	5Kg/cm ²						
Power consumption in operating mode (approx. Kw)	10Kw	10Kw	10Kw	11Kw	11Kw	13Kw	
DIMENSION(L)	3,300	3,590	4,050	4,670	4,670	5,600	
WEIGHT (Kg)	1,100kg	1,300kg	1,500kg	1,750kg	1,800kg	2,700kg	

Unit : mm, %, minute OP:OPTION

subjects to be changed without prior notice

Thank You !

