
malcom

The world standard instrument for measuring the viscosity of solder paste

Model:PCU-285

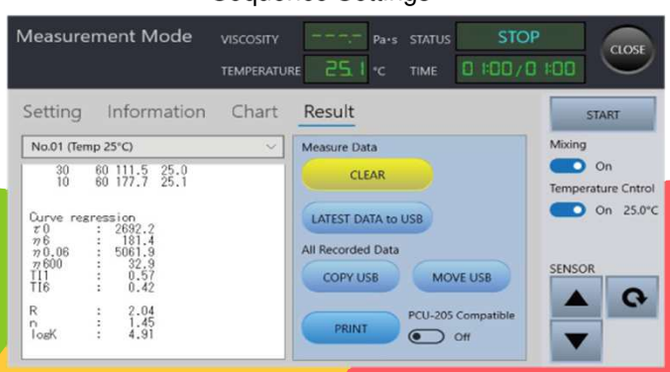
Spiral Viscometer

World Standard for Solder Paste Quality Control, JIS, IEC Standard

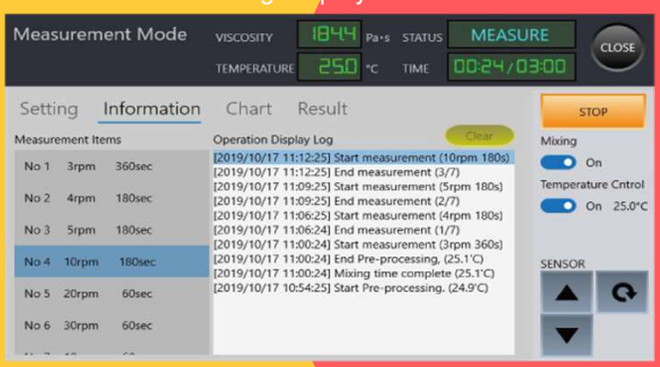
- Patented Spiral-Pump sensor provides quick, easy, and repeatable measurements.
- Continuous measurement of Newtonian and non-Newtonian fluids with constant shear rate and shear time.
- Automatic control of measurement according to JIS standard regardless of operator skill.
- Built-in printer (option) allows logging of acquired measurements.

Real Time Graph Display

Sequence Settings



Log Display



Measurement Result Display

Specifications	
Viscosity Sensor	Malcom spiral-pump method
Viscosity Range	5～800 (Pa.s)
Speed Range (N)	1～50rpm
Shear Rate (D)	(0.6×N) s^{-1}
Measurement Accuracy	±5% of the indicated value
Speed Accuracy	±2%
Speed Repeatability	±0.5%
Temp. Control Range	15～35℃ (±5℃ of room temp.) built-in thermostat
Printer Display	Temp, Viscosity, Shear Rate, rpm & Date
Interface	USB (On-line Measurement *)
Software	VAM-5
Power Supply	AC100～240V 50/60Hz 120VA
Outer Dimensions	275 (W) x 214 (D) x 439.5 (H) (mm)
Weight	Approx. 12kg

* The specifications are subject to change without notice.

Spiral Viscometers

The unique spiral pump rotation method makes it less susceptible to fluid settling and separation. Uniform measurements are possible, and it can also be used with highly viscous samples. High reproducibility and accuracy, Wide range of applications and Models, Easy Operation.

Model:PCU-02V

Malcom's Spiral Sensor enables to measure Viscosity and Thixotropy with 0.2cc, Small Amount of Sample. JIS Standard
● PCU-02V is optimum device for Expensive Materials Testing & Analysis.
● Measure materials having high Thixotropy with good repeatability.
(constant Shear rate & time)

Model:PC-11 Series

World Standard for Solder Paste Quality Control
● Measure a variety of Low Viscosity to High Viscosity fluids.
● Malcom's Unique Spiral Pump Sensor is employed, enables for continuous measurement of non-Newtonian fluid reproducibly.
● Dedicated software easily tests Flow Characteristic.

Model:PM-3 Series

A hand-held Spiral Viscometer with Spiral Sensors.
● Continuously measure high thixotropic fluid with high repeatability (constant shear rate & time)
● Easy-to-see digital display
● Wide measurement range.
● Equipped a temperature sensor.

Model:PPV-1

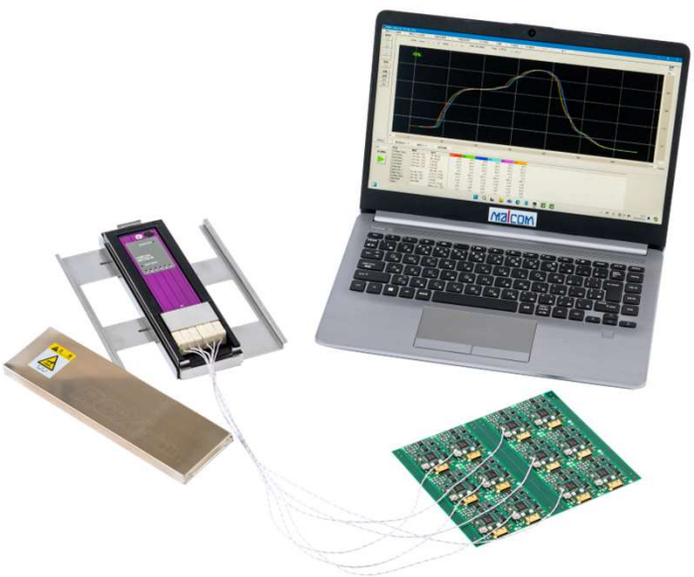
To the SMT Stencil Printer Manufacturer

Malcom's unique miniaturized Spiral Sensor enables the measurement of solder paste viscosity in confined spaces inside an SMT stencil printer. It offers continuous, highly repeatable measurements of non-Newtonian fluids, ensuring reliable performance.
The PPV-1 is installed near the top of the SMT stencil printer. During the printing process, its sensor is inserted into the pool of solder paste formed during rolling to measure the viscosity.

Reflow Checker Series

Modular Type (RCX-1 series) & **RCP-200** is a system in which a heat-resistant memory unit moves together with the object to be measured inside the Reflow Oven, measures the temperature at a constant interval and memorizes the data, and an interface unit, when the heat-resistant memory unit is taken out of the Reflow Oven and connected USB cable to this unit, outputs the temperature profile.

Model:RCX-1 Series



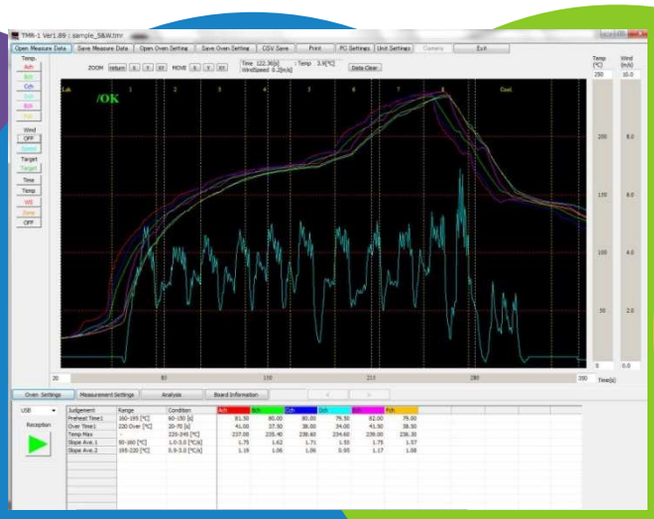
Model:RCP-200

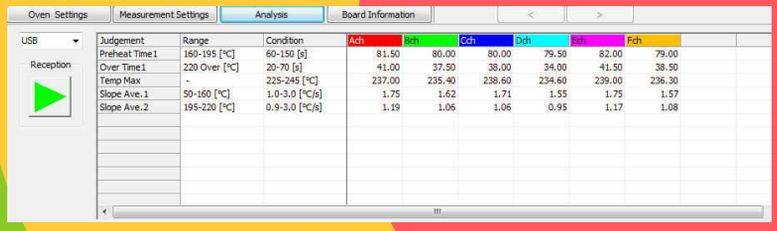
TMR-1 for Reflow Checker Software

Evaluate and control reflow process from different angles, not only temperature control of a reflow oven.
The temperature profile prediction function helps smoothly examine a profile.

- Simultaneously display Profile & Data of Temperature, Wind Speed, O_2 Concentration on the same screen.
- Profile Support function offers easy profile creation.

Print Data





Analysis Data

Simply adding one module to the RCX-1, you can measure O2 concentration, Real-time profiles, Camera systems, 12 channels, Wind speed, and Vibration inside the Reflow oven.

Model:RCX-C
Observation Monitor

● A Removal Camera is directly mounted on a PC board, which offers viewing from various points.
● Monitoring from upper, side & diagonal are also possible
with a Imaging Mirror.

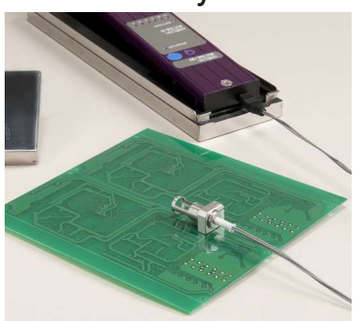
Model:RCX-O
O2 Concentration Monitor

● Measure O2 density of the important point on a PC board.
● Take measurement in the same reflow conditions as that of during production.
● The measurement range is selectable.
(50 ppm～5,000 ppm or 1,000 ppm～10,000 ppm)

Model:RCX-V
Vibration Monitor

● Two Vibration modules on a PC board, measuring in a reflow oven.
● Check the status of a PC board when moving from machine to machine.
● Analyze defective soldering due to Vibration.
● Measure the vibration from the entrance to exit of a reflow oven.
● How variances in wind speed affects Vibration.

Model:RCX-W
Air Velocity Monitor



● A wind speed sensor mounted on a PC board measures wind speed of the important point.
● Take measurement in the same reflow conditions as that of during production.
● Measure wind speed from upper or side directions.

Model:RCX-T
Additional & 6 channels

● Add RCX-T Reflow Checker Memory Unit with Additional 6 channels to RCX-S Reflow Checker
Memory Unit (6 channels), providing 12 points measurement.
● Can be used as 12 channels to study profiles, for evaluation, trial and daily production, employed as 6 channels.

Model:RCX-R
Real-time Monitor

● You can change the device settings while checking the temperature profile.
● Check the temperature profile in real time on a PC.
● Increase efficiently of studying temperature profiles.
● The built-in memory function avoids losing data.
● Complies with wireless LAN standards.

Flow Soldering Quality Control

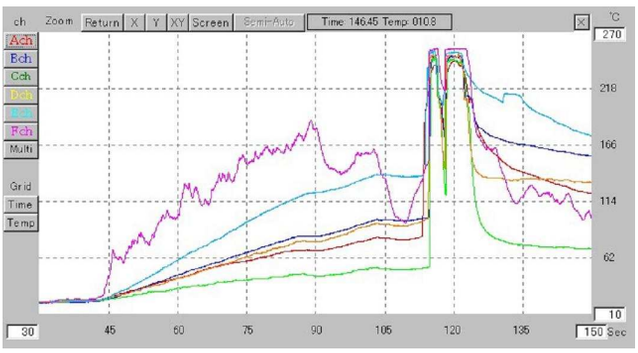
Model:DS-11
Wave Soldering Dip Tester

● Equipped with a Dip Time Sensor, providing more accurate measurement.
● Transfer data to a PC by USB, creating temperature profile.
● Dedicated software realizes high level management of flow soldering.

Model:DS-11S
Selective Soldering Dip Tester

Preheat and soldering temperatures, XY speed, and soldering dimensions for XY nozzles are automatically determined, enabling easy device condition management.

Model:FCX-50
Flow Profiler



The Flow Profiler is a system in which a heat-resistant memory unit moves together with the object to be measured inside the flow solder bath, measures the temperature at a constant interval and memorizes the data, and an interface unit, when the heat-resistant memory unit is taken out of the furnace and connected USB cable to this unit, outputs the temperature profile.

Model:MS-9C
Flux Controller

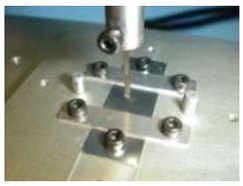
Automated control of Specific Gravity and Level of Flux for Wave Soldering Machine.
● Specific Gravity, Level, Temperature sensors, and Bob automatically control flux.
● 1/1000 digit display of Specific gravity and flux temperature are shown on the digital display.
● The exclusive features of MS-9C are 1/10000 digit display of Specific gravity, built-in Moisture compensation circuit (0% conversion) and RS-232C output connector.

Model: MD-9900
Specific Gravity Controller

Continuously observe the specific gravity of liquid.
● Upper and lower limit contact output.
● Temperature sensor allows for temperature compensation of value of specific gravity.

Solder Paste Quality Control

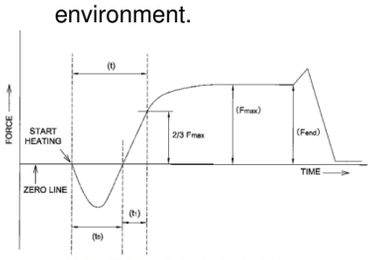
Model:SWB-2
Dip Wetting Tester



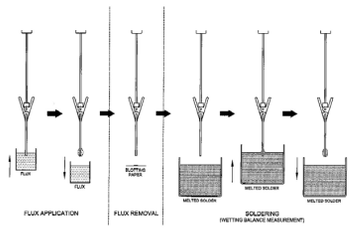
CHIP PLACEMENT SYSTEM (option)

- Reduces unstable measurement results and minimizes user error.
- The Micro Wetting Balance method allows for the evaluation of micro parts, such as 0402 and 0603 sizes. An optional Chip Placement System is available for installing microchip components on a jig.
- Complies with the Wetting Test Method as per JIS Z3198 (Lead-Free Solder Test Method) and various international standards.
- The exclusive PC software efficiently analyzes data, displays waveforms and data together on one screen, and allows for data saving and more.
- An optional cover enables wetting evaluation in an N2 environment.

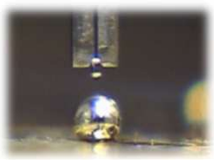
Fmax: Maximum wetting force.
Fend: Wetting force at the end of wetting measurement.
t0: The time at which wetting starts. The time from the start of measurement (when the test piece contacts the solder), changing negative wetting force into positive.
t1: Wetting force. The time from the zero point to 2/3 of the max wetting force.
t: The wetting time. The time from the start of measurement (when the test piece contacts the solder) to 2/3 of the max wetting force.
Sb: Wetting stability. The ratio of the last wetting force and the max. wetting force. F end / F max x 100 (%)

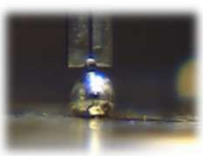


WAVE FORM ANALYSIS



MEASUREMENT PROCEDURE





Specifications				
Load Sensor	Principle	Electro-Balance Sensor (EBS)	Solder Temp. Setting	Room Temp.～400℃ (Room Temp.～320℃ for Micro Wetting Balance Method)
	Measuring Range	30mN～－30mN	N2 Measurement (option)	O2 concentration: 500ppm max.
	Accuracy	±0.05mN	Power Supply	AC100, 115, 200, 220 & 240V 50/60Hz
	Resolution	0.01mN	Outer Dimension	330mm (D) x 300mm (W) x 370mm (H)
Temp. Sensor	Measuring Range	Room Temp. ～450℃	Weight	Approx. 16kg
	Accuracy	±3℃	Applicable OS	Windows 10 or later
Insertion Time, Depth, Speed		1～200s, 0.01～20.00mm 0.01mm step, 0.1～30mm/s	Operating Environment	The above OS operates
* The specifications are subject to change without notice.				

Model:TK-1S
Tackiness Tester

- Reproducibly measure tackiness of solder paste printed by a dedicated printer.
- There are three insertion methods selectable below.
  * Press Insertion Method (JIS standard)
  * Insertion Depth Method
  * Point Insertion Method (IPC standard)
- You can change the setting conditions.
- Without having to enter the settings, easy measure tackiness by JIS and IPC standards.
- Compact and space-saving design.

Solder Paste Softeners

Model:SPS-10

Softens solder paste directly in its original container, eliminating concerns about oxidation and humidity.

● The automated operation ensures gentle softening, achieving a consistent texture without the unevenness caused by hand mixing.

● Ready-to-use in just 10–20 minutes, even for solder paste taken straight from the refrigerator.

Model:SPS-3000

The world's first built-in temperature monitoring system ensures optimal solder paste conditions, regardless of variations in starting operation temperature, room temperature, or solder paste viscosity.

● High-speed rotation at approximately 1,000 rpm quickly softens solder paste.

● The built-in auto-balance system automatically adjusts to the solder paste's weight.

Vacuum Mixing System with Centrifugal System

Model:SY-8VMCS & SY-17VMCS series

Specifications	
Model	SY-8VMCS
Syringe	10cc x 16pcs. or 30cc or 55cc x 8pcs. (selectable on request)
Mixing Method	Rotation variable angle method
Mixing Capacity	2cc～10cc / ～30cc / ～55cc
Adapter	10cc x 4pcs. / 30cc or 55cc x 2pcs.
Rotation Speed	Revolution: 200～700rpm / Rotation: 1/2 of the revolution speed
Timer	Max. 9min. 59sec. / step
Max.Vacuum Pressure	0.5kPa
Operation Settings	Max. 10 steps 8 steps (rpm・Time・Vacuum) 2 steps (Time・Vacuum)
Safety Functions	Door lock in operation
Memory Function	Allow to memorize settings. (max. 10 items)
Power Source	100VAC or 120VAC or 220VAC or 240VAC 50/60Hz (selectable on request)
Power Consumption	30W during standby / Max. 1kW in operation
Outer Dimensions	645 (D) x 610 (W) x 910 (H) mm
Weight	Approx. 130 kg
* The specifications are subject to change without notice.	

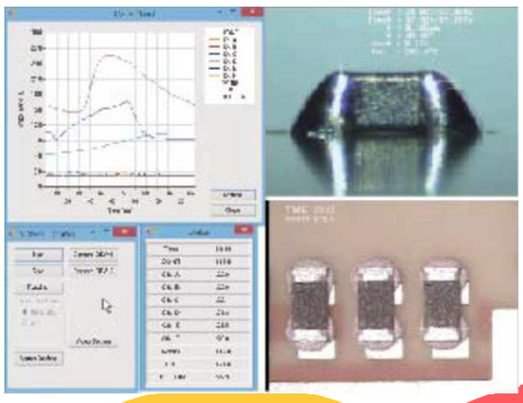
Reflow Simulator

Model:SRS-1C

● The top face heater matrix control, original of this company, permits heating test to be conducted at optimum temperature distribution even for a substrate of poor balance in thermal capacity.
● The heating stage permits arbitrary setting of both temperature and time, hence the duration time of the reflow peak temperature can be extended freely.
● Three observation windows set on the front, back and top faces of the equipment permit visual observation of the state of the work in the furnace from every angle.
● By combining with various measuring apparatuses, it is possible to obtain the data of the image, temperature profile, work displacement, etc.

Video Camera Capture System

Model:VDM-3



The VDM-3 receives the time, temperature, wettability and other signals from MALCOM products compliant with the VDM-3 and outputs these signals overlapped on video signals taken by a video camera photographing simultaneously. It has a scale function for measuring a displayed object. The dedicated software (VDM3) operates on Windows, creating necessary data for work, providing functions of user interface. Since the PC of this device is dedicated to the operation of this software, installing software and drivers made by other companies can cause the operation to become unstable. The video player (VDM3 Player) provides the measurement data recorded with VDM-3 and the function to reproduce the recorded image.

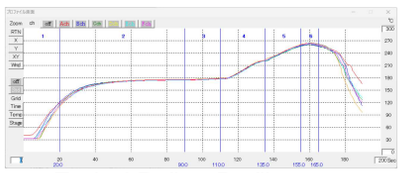
Compact Reflow Oven

Model:RDT-250II

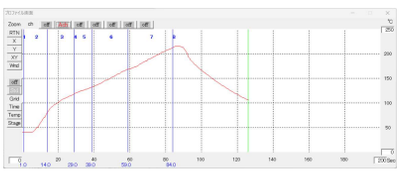
- This device is designed for easy use in simulating reflow soldering and handling small-lot, high-mix production.
- The entire process is completed without moving the printed circuit board, enabling simultaneous profile measurement and visual observation.
- Its space-saving design and matrix-controlled top heater provide optimal heat distribution tailored to the component layout on the board.

✓ Achieve various heating conditions in a short time

Preheat and main heating times can be freely adjusted.
A different profile can be created for each cycle, allowing for shortened standby times and reduced power consumption during standby.
Soldering evaluation based on different oxygen concentrations is also possible.
The system supports high-temperature reflow up to MAX 400°C for high-temperature soldering.



Typical Reflow Profile



Reflow profile without preheat

✓ Heater matrix control provides superior temperature distribution.

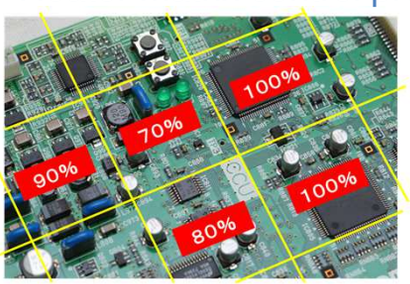
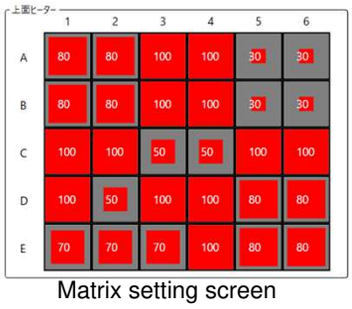
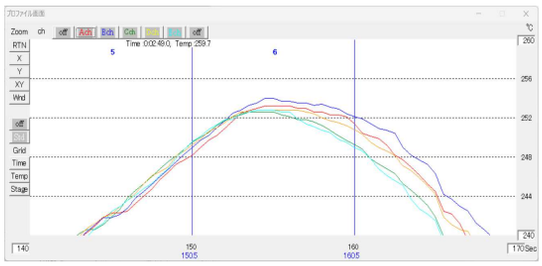


image of a printed circuit board



Matrix setting screen

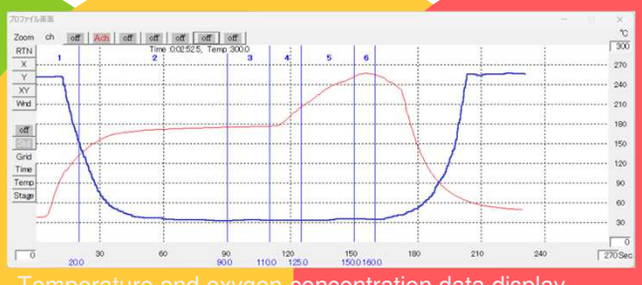


screen display that shows peak temperature measurements

The 30-division top heater control allows you to adjust the overall temperature distribution by applying heat load to parts with large heat capacity and reducing it to parts with small heat capacity.
The bottom heater can be controlled in 6 divisions.

✓ You can freely control the reflow heating and forced cooling processes in a nitrogen atmosphere.

Operating and cooling gas flow control valve



Temperature and oxygen concentration data display

Achieves a nitrogen atmosphere with an oxygen concentration of at least 100 ppm.
The oxygen level inside the furnace can be manually adjusted using the optional oxygen concentration meter and mixing meter.
Real-time data output from the optional oxygen concentration meter can be displayed simultaneously with the temperature profile data.
The cooling gradient can be finely tuned by adjusting the cooling gas flow control valve (flow meter) located at the bottom of the device.

✓ Built-in PC saves space

A built-in PC, along with a keyboard and mouse, can be stored within the device, enabling efficient use of workspace.
The touch panel display ensures easy operation for the operator.
The device supports up to 7 thermocouple channels.

✓ Combines infrared and convection hot air heating to create an ideal profile.

- The system allows real-time monitoring of up to 7 channels to check the temperature profile.
- **Manual Mode:**

•Set parameters individually for each heater (top and bottom), hot air, fan rotation speed (air volume), and time across 3 to 10 stages.
•This enables you to derive various reflow conditions tailored to your needs.

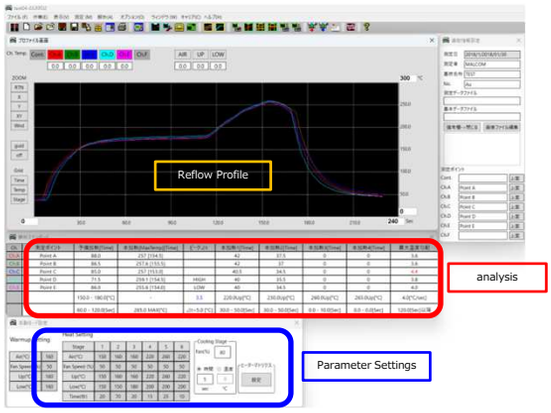
- **Auto Mode:**

•Simply input parameters for the 4 key stages:

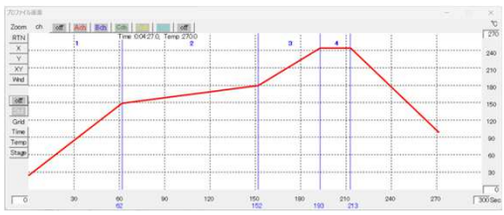
i. Preheat temperature rise
ii. Preheat hold
iii. Main heating temperature rise
iv. Main heating hold

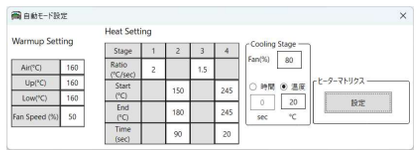
•The profile will be automatically generated with the heaters adjusted accordingly.

- The system provides a clear pass/fail indication for reflow conditions like preheating and main heating. This feature helps you efficiently optimize settings and streamline operations.

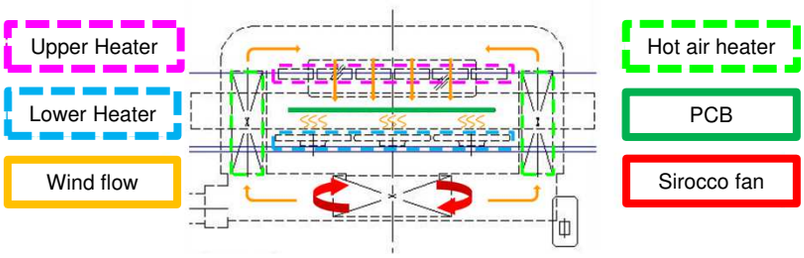


Manual Mode



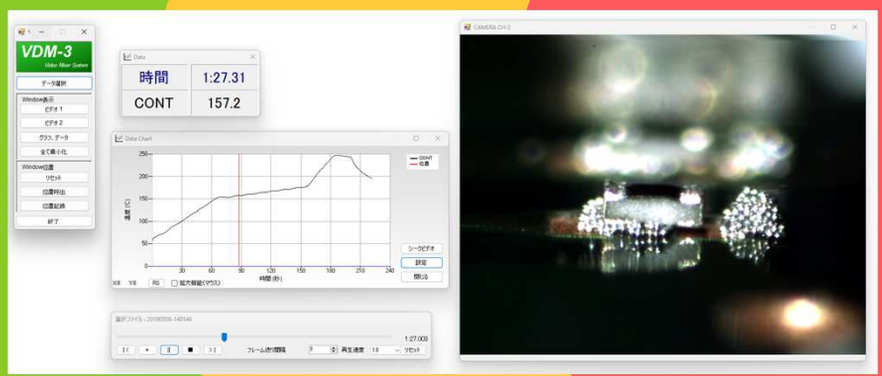


Auto Mode



✓ The heating status can be monitored using an optional video observation system.

- The interior of the furnace can be visually observed through the glass window located at the back.
- By integrating the optional video camera capture system <VDM-3>, a high-definition camera captures high-quality images of the furnace interior.
- During playback, not only the recorded images but also profile data, such as temperature, measurement time, and other outputs from the device, can be displayed on the screen.



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Standard List of Malcom Products

Spiral Viscometer （PCU-285 & PC-11) JIS Z3284-3, IEC 61189-5, IPC J-STD-005 & IPC-TM-650 2.4.34.2/2.4.34.3
Spiral Viscometer (PCU-02V) JIS Z3285
Wetting Tester (SP-2 & SWB-2) JIS C60068-2-69, JIS Z3198-4, ISO9455-16, IEC 60068-2-69, IPC J-STD-003, IPC-TM-650 2.4.14.2, MIL STD883 2022.2
Solder Paste Wetting Tester (SP-2) JIS C60068-2-83, JIS Z3284-4 & IEC 60068-2-83
Solder Paste Tackiness Tester (TK-1S) JIS Z3284-3, IEC 61189-5, IPC J-STD-005 & IPC-TM-650 2.4.44

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