

FLYING PROBE TESTER FA1240

FLYING PROBE TESTER FA1240-51/-52/-53

Automatic Testing Equipment



90% reduction in data creation time

More than 93% reduction in line downtime

Pursuing ease of use and reliability

Testing of populated, fine-pitch boards requires not only machine performance, but also exceptional operator skill. **The FLYING PROBE TESTER FA1240-51/-52/-53** brings **exceptional ease of use** to a highly reliable populated board testing system **that combines HIOKI's measurement technology** with **durable, high-precision hardware**. Operation is intuitive, following precisely defined workflows with guidance on graphical screens so that high-quality testing is a constant, regardless of who operates the system.



Operator screen also available in Chinese



new

1

Simply follow the workflow.

Quickly complete programs that take into account component height

◆Improved operability

The FA1240-50 features a redesigned user interface.

Control screens make extensive use of graphics to keep operation intuitive.

A high level of visibility on the production floor reflects the user-friendly focus of the system's design.

The control screens that make up this newly developed graphical application,

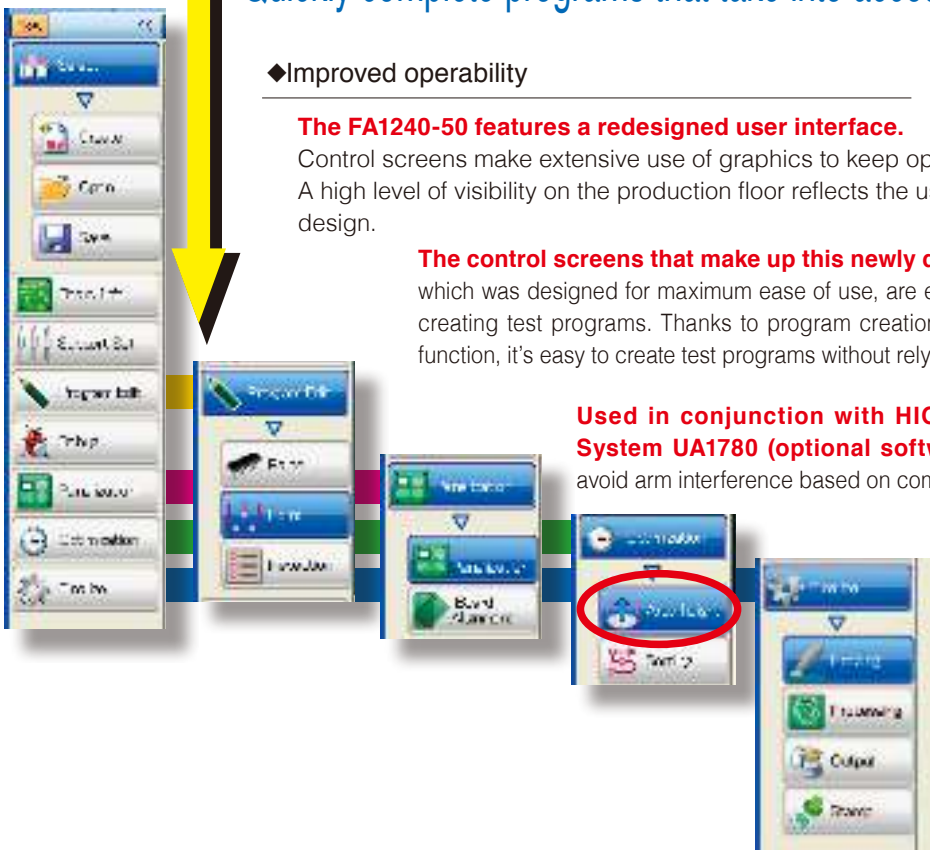
which was designed for maximum ease of use, are easy on the operators who are tasked with creating test programs. Thanks to program creation workflows and an operation assistance function, it's easy to create test programs without relying on system documentation.

Used in conjunction with HIOKI's FIT-LINE Test Data Creation System UA1780 (optional software), the FA1240-50 can automatically avoid arm interference based on component contour information.

Slash line downtime by 93%.

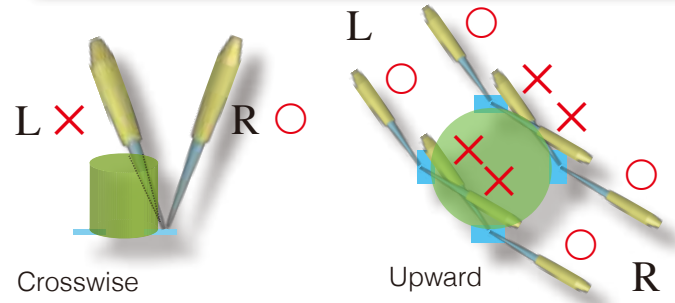
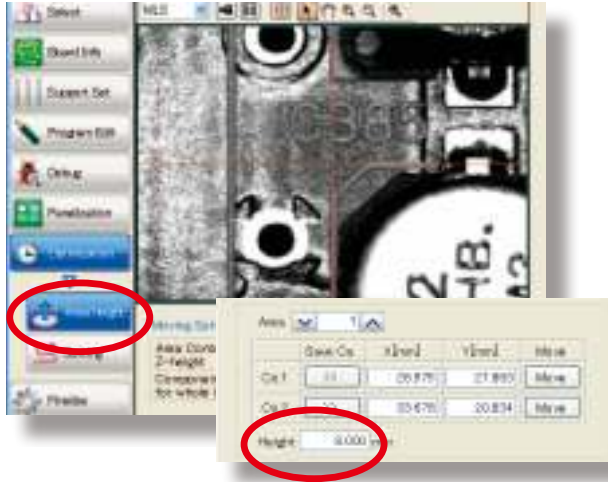
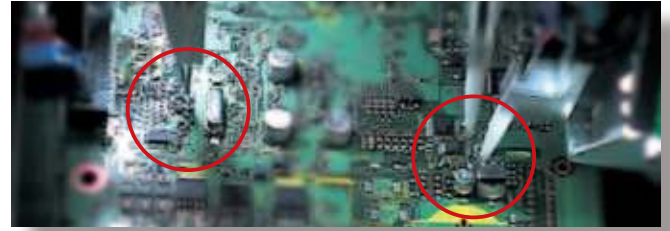
Used in combination with the UA1780, the FA1240-50 can reduce test line downtime by 93% though effective data creation and debugging work.

HIOKI invites you to experience the new FA1240-50's man-machine interface for yourself.



NEW **2** Automatic calculation of arm interference (when used with the UA1780)

By combining the FA1240 and UA1780, you ensure that all necessary component information is taken into account. The system automatically calculates where interference between arms and components will occur and avoids it. Because it is possible to complete cumbersome and time-consuming verification work safely and rapidly, data creation time can be greatly shortened.



Probes are installed at an angle to allow probing of adjacent lands. At probing points near tall components, it is essential to check for interference between angled probes and components and to configure settings to avoid that eventuality.

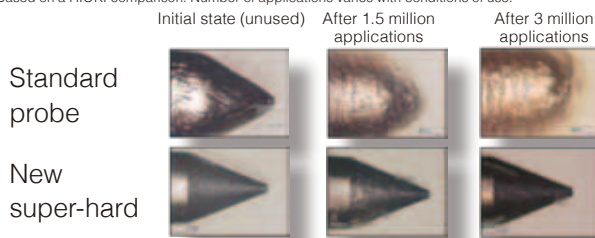
Since UA1780 FIT-LINE data provides physical information about board features such as component shape, size, and height data, the FA1240 **takes into account interference between probes and components based on that information and automatically selects arms from the dual standpoints of safety and optimal efficiency.** This allows safe, rapid probing without any special knowledge of the apparatus.

NEW **3** New probes (easy replacement and long service life)

◆10 times the number of applications

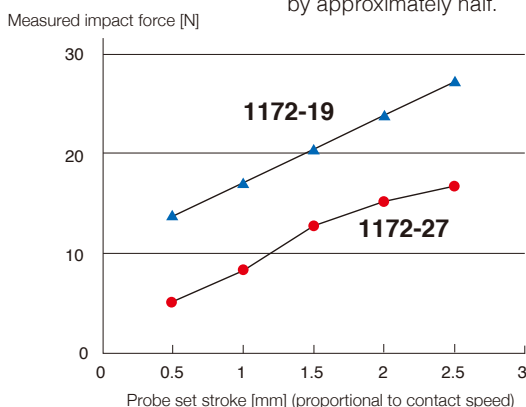
No damage, even after 3 million applications

*Based on a HIOKI comparison. Number of applications varies with conditions of use.

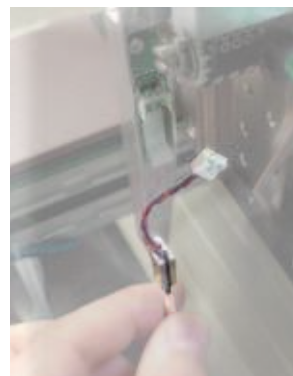


HIOKI's new probe designs reduce the impact force imposed on the contact surface by approximately half.

◆Half the impact force



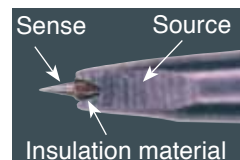
◆Easy probe replacement



The FA1240-50 series is designed to improve probe replaceability, dramatically reducing system downtime caused by probe replacement. Less frequent probe replacement means significantly improved system availability.

◆Available 4-terminal probes (1172-46)

HIOKI's proprietary extra-fine coaxial probe design implements the 4-terminal resistance measurement method using only two probes spaced just 0.5 mm apart. These probes allow low resistance values on the order of several hundreds of milliohms to be measured precisely without being affected by the probe's contact resistance.



Support for 0.5 mm pitch and 0.3 mm line width

Only HIOKI offers a coaxial flying probe design!

90% reduction in data creation time. More than 93% reduction in line downtime.

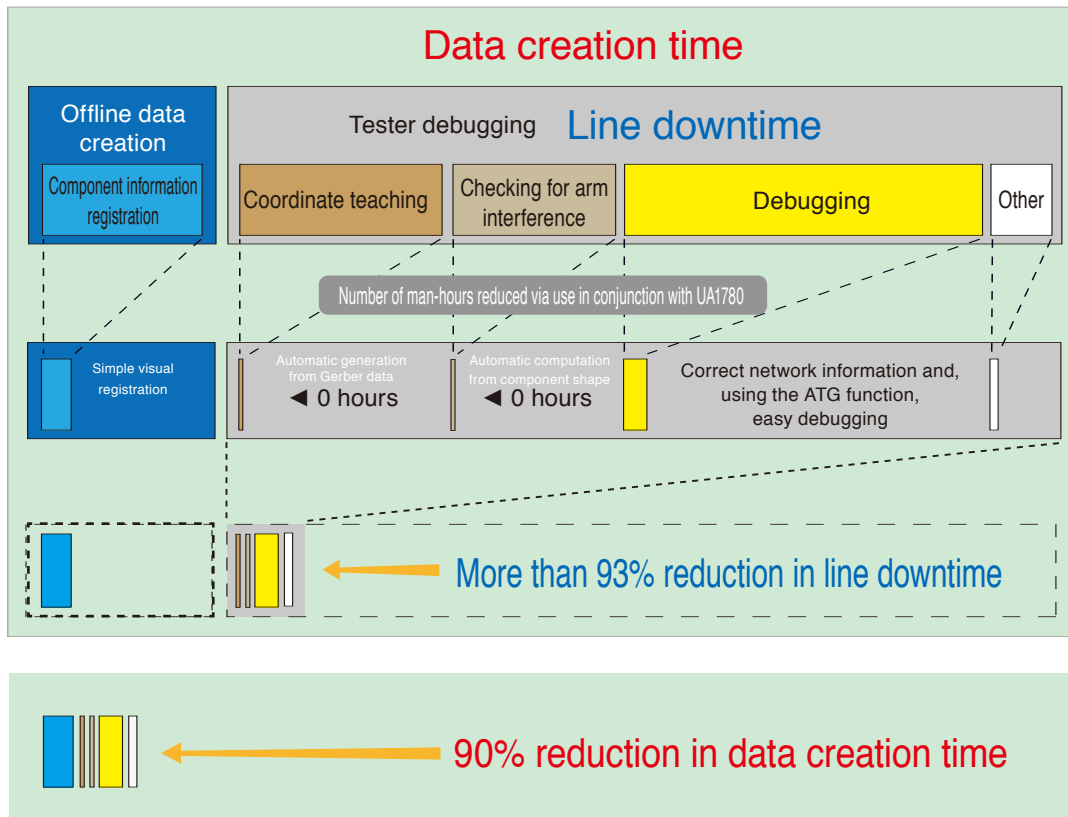
The FA1240-50 series now features even closer data integration with the UA1780 FIT-LINE Gerber data editing software.

The FA1240's system software integrates closely with HIOKI's new Gerber data editing software, UA1780 FIT-LINE.

The UA1780 is a proprietary HIOKI data creation system that gives maximum consideration to the FA1240 system status.

The UA1780 outputs all information needed to simplify data creation on the FA1240 using a new data format.

Consequently, when the FA1240 is used with the UA1780, it is possible to create high-quality test programs quickly, without the need for time-consuming manual correction. Use the UA1780 Gerber data editing software (FIT-LINE) with the FA1240.

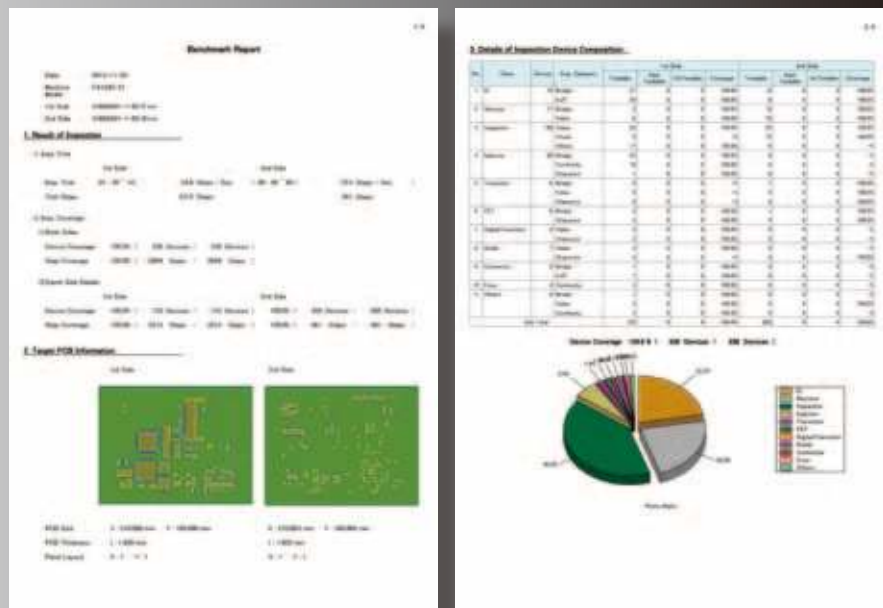


Robust follow-up after data has been created

◆Statistical quality management

The software automatically calculates statistics such as testing times and test coverage rates in the test data and outputs benchmark reports.

These reports can be provided to EMSs and other end-users.

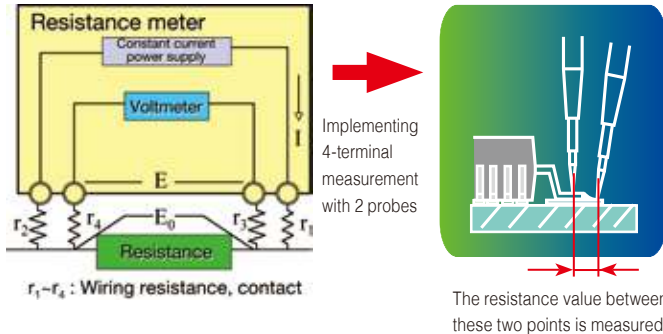


Exceptional measurement technology

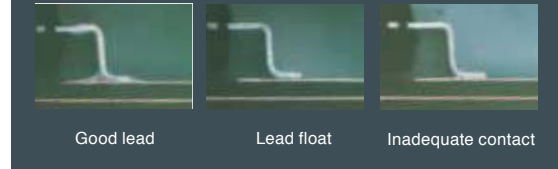
STANDARD 1 Detection of electrical component pseudo-contact states

Delivering increased process detection rates

The 4-terminal low-resistance measurement method can be used to detect lead float on lead frame components. Dedicated probes can accommodate pitches of up to 0.5 mm.



Since HIOKI's proprietary lead float detection function makes judgments based on the resistance values between leads and pads, signal attributes are irrelevant. And since the process is not affected by internal component circuitry, the method also provides an effective means of detecting lead float for ICs and SMT connectors.

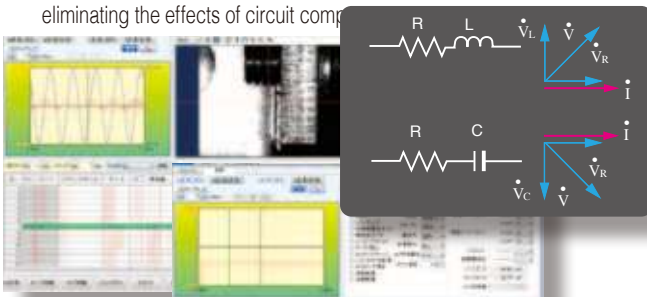


Low-resistance measurement technology that makes judgments on the order of several hundreds of microohms delivers a higher level of quality by judging the reliability of electrical connections between leads and pads and going beyond detecting just lead float to also pinpoint pseudo-contact defects.

STANDARD 2 LCR measurement technology

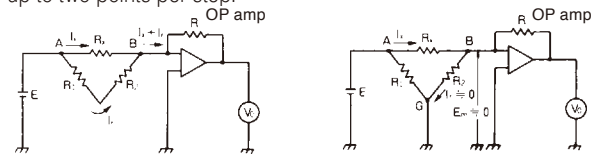
◆Separate testing of composite components

By using AC measurement in combination with guarding (at up to two points), measurement of separate phases can be performed while eliminating the effects of circuit components.



◆Guarding

Component tests use guarding so that it is possible to measure individual components' mounted values under identical conditions, independent of peripheral circuitry. Guarding can be performed at up to two points per step.



STANDARD 3 Preventing damage to objects under measurement

◆Measurement uses component-friendly voltages of 0.2 V and less

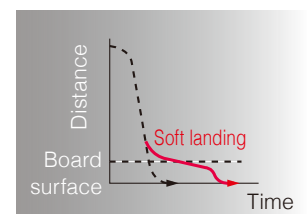
Since constant-voltage measurement at 0.1 V is used in resistance measurement and a limit voltage of 0.2 V is used in other LCR measurements, measurement does not subject semiconductor components to an undue level of stress. (*A voltage of 0.4 V is used for 4M and greater measurements.)

◆Discharge function

Although discharge is automatically performed for every measurement step, you can also add discharge times on a step-by-step basis as desired.

◆Soft landing function

The speed of the probe's descent is controlled. The speed is decelerated just before the probe contacts the board to decrease the impact force and prevent damage to the board. The speed can be set for test steps, groups, or the entire process.



STANDARD 4 Functionality for increasing detection rates

◆Contact defects are prevented by means of an extensive selection of retry functions, helping to prevent erroneous judgments.

The FA1240 provides an extensive range of functionality for preventing contact defects and erroneous judgments, including moving retries, which move probes in four directions; up/down retries, which raise and lower probes at a fixed point; retests, which test just FAIL steps again; and an option to prohibit open retries, which disables retesting of steps that have generated open judgments.

◆Standard support pins

The FA1240 ships standard with three support pins to correct downward board flex, preventing inadequate contact.

◆Electrolytic capacitor reverse insertion check

The FA1240 can check for reverse insertion of electrolytic capacitors, a defect that can only be identified visually, using probes from the bottom of the board (optional feature).

Options and Special-order Features

FA1240-51/-52 / FA1241-51/-52

Support for large-format boards
510 (W) × 460 (D) mm

FA1240-51:
Delivers super-fast testing at
up to 40 steps/sec.
FA1240-52:
Designed for use in IC
pseudo-contact testing.



FA1240-53

Support for M rack boards
400 (W) × 330 (D) mm

High-speed inspection apparatus
designed for production lines which
features a compact design
Delivers super-fast testing at up to
40 steps/sec.



List of Options

Model	Part name	FA1240-51 FA1241-51	FA1240-52 FA1241-52	FA1240-53
1940-51	Alignment Camera, MR Arm	○		
1940-52	Alignment Camera, MR Arm			○
1940-61	Component Alignment Camera, MR Arm	○		
1940-62	Component Alignment Camera, MR Arm			○
1941-61	Stamp Unit, R Arm		○	
1941-63	Stamp Unit, R Arm (priority installation)			○
1941-64	Stamp Unit, L Arm			○
1942-01	Feed Rails		○	
1942-11	Automatic Width Adjustment Function	○		
1942-12	Automatic Width Adjustment Function			○
1950-04	Laser-based Board Thickness Correction Function	○		
1950-05	Laser-based Board Thickness Correction Function			○
1164-56	Support Pins		○	
1942-41	Line Support Unit	○		
1942-42	Line Support Unit			□
1944-03	Expansion I/O board(Install up to 3 boards)		○	
FA1139-04	Off-line software		○	
FA1395	Recovery CD		○	
1330	Measurement Unit Calibration Unit		○	
1935-24	DC Measurement Board Unit(active testing)		○	
1938-01	High-voltage Zener Diode Measurement Unit		○	
1939-01	Measurement Switch Board(read relay type)		○	
1939-02	Measurement Switch Board(power relay type)		○	

Options Available for Separate Purchase

Model	Part name
UA1780	FIT-LINE Data Creation System (including 4-year license)
UA1780-01	FIT-LINE Data Creation System (including 1-year license)
UA1780-11	One-year license renewal *Product includes license key only.
UA1780-14	Four-year license renewal *Product includes license key only.
UA1782	FAIL VISUALIZER

Consumable Probe Options

Model	Part name
1172-19	Contact probe
1172-27	Hardened probe
1172-46	4-terminal probe

Additional Accessory Options

Model	Part name
1196	Recording Paper (for printer) (set of 10 rolls)
1350-02	Offset Board
1134-02	Probe Impact Sheet (set of 132 sheets)

■Alignment cameras

An alignment camera can be mounted on each arm to provide high-precision probing. Component alignment corrects for misalignment of individual components after mounting and is used when making direct contact with component leads. (Options 1940-51 and 1940-61 cannot be installed at the same time.)



■Stamp units, R and L arms

Tested boards can be marked with stamps. Module-specific, group-specific, and overall test data stamp settings are supported and provide an effective means of preventing defective and untested boards from getting mixed in with PASS boards.



■Automatic width adjustment function

By including the board width in the test data, it is possible to automatically adjust the tester to the board width when reading the test data. This feature can be combined with board count setup editing, a standard feature, to allow automatic setup for different boards.



■Feed Rails

One untested board can be placed on the feed rails. The rails can be used to assist the operator during standalone FA1240 automatic operation (no pre- or post-process device) when feeding or ejecting boards.



■Laser-Based Board Thickness Correction Function

Detects board flex and corrects probing positions for proper measurement.



■Line Support Unit

Used in combination with the automatic width adjustment function. Allows support pins specified for each test program to be raised when moving in the Y-axis direction as appropriate for the size of the board.



Parameter	FA1240-51 (* ¹ FA1241-51)	FA1240-52 (* ¹ FA1241-52)	FA1240-53
Measurement speed	Combination measurement: From 0.025 s/step	Combination measurement: From 0.033 s/step	Combination measurement: From 0.025 s/step
Probe installation angle (L, ML, MR, R)	-11° / +1.8° / -6°.0° / +6°.11° / -1.8°	-10° / +5°.0° / 0°.0° / 0°.10° / -5°	-11° / +1.8°.0° / -6°.0° / +6°.11° / -1.8°
Min. probing pitch	0.2 mm (with 4-terminal probes: 0.5 mm)	0.2 mm (with 4-terminal probes: 0.5 mm) (for both probe types, 7.5 mm between ML and MR arms)	0.2 mm (with 4-terminal probes: 0.5 mm)
Probe installation method	One-touch connector	One-touch connector	One-touch connector
Testable size	Max. 510 (W) × 460 (D) mm	Max. 510 (W) × 460 (D) mm	Max. 400 (W) × 330 (D) mm
Max. component mounting range	Upper: 38.2 mm (including board thickness)	Upper: 38.2 mm (including board thickness)	Upper: 28.0 mm (including board thickness)
External dimensions (W) × (D) × (H)	1,410 × 1,300 × 1,380 mm	1,410 × 1,300 × 1,380 mm	1,320 × 1,369 × 1,425 mm
Tester weight	1,150 kg	1,150 kg	1,050 kg

FA1240-51, FA1240-52, FA1240-53 FA1241-51, FA1241-52		Common Specifications
No. of arms	4 (L, ML, MR, R)	
No. of test steps	40,000 (max.)	
Coordinate specification method	Step XY	
Measurement range	Resistance	: 400 μΩ - 40 MΩ
	Capacitor(s)	: 1 pF - 400 mF
	Inductance	: 1 μH - 100 H
	Diode VZ measurement	: 0 - 25 V
	Zener diode VZ measurement	: 0 - 25 V
		: 25 - 80 V (optional)
	Digital transistor	: 0 - 25 V
	Photocoupler	: 0 - 25 V
	Short	: 0.4 Ω - 400 kΩ
	Open	: 4 Ω - 40 MΩ
	DC voltage measurement	: 0 - 25 V
	Function feature voltage measurement	: ±40 V (optional)
	Relay on resistance measurement	: 40 m - 40 Ω (optional)
	FET on resistance measurement	: 400 m - 400 Ω (optional)
Simple function measurement	: ±25 V (optional)	
Test signals	DC constant voltage	: 100 mV/400 mV (2 ranges)
	DC constant current	: 200 nA - 200 mA (13 ranges)
	AC constant voltage	: 0.1 V rms (1 range)
Measuring component	DC voltage measurement	: 800 μV - 25 V f.s. (8 ranges)
	DC current measurement	: 100 nA - 25 mA f.s. (7 ranges)
	AC ammeter	: 10 μA - 10 mA rms (4 ranges)
Judgment range	-99.9 % to +999.9 % or absolute value	
Guarding	2 points/step and lower probe channel guard specification	
Probing precision	Within ±100 μm per arm (X/Y direction)	
Positioning repeatability	Within ±50 μm (probing position)	
Minimum movement step	X-Y	: 1.00 μm/pulse
	Z	: 6.00 μm/pulse
Probe work area	510 (W) × 460 (D) mm (FA1240-51/52) 400 (W) × 330 (D) mm (FA1240-53)	
Min. pad diameter	φ100 μm	
Component mount range	Lower surface: Max. 100 mm (based on following conditions)	
	30.0 mm from reference rail: 90.0 mm 125.0 mm from movable rail: 85.0 mm No components within 3 mm of both sides of board (transport margin)	
Display section	17" LCD display	

FA1240-51, FA1240-52, FA1240-53 FA1241-51, FA1241-52		Common Specifications
Safety features	Emergency stop switch, safety cover (made of anti-static resin) / arm and probe interference prevention software / Moving parts interference prevention limit switch / isolating transformer	
Warning features	Signal tower (3-light), buzzer	
Power supply used	AC 200 V ±10% (single-phase) 50/60 Hz (*FA1241: AC 230 V ±10%) Power consumption: 6 kVA max. (*FA1240-53: 5 kVA)	
Pneumatic system	Pressure used (primary) : 0.5 0 - 0.99 MPa (dry air) Set pressure (secondary) : 0.5 ± 0.1 MPa	
Air consumption	Max. 0.3 NI/min.	
Environmental conditions	Temperature: 23 ± 10°C	
	Humidity: 75 %rh or less (no condensation)	
	Air: Avoid use in the presence of excessive dust, vibration, or corrosive gases. Floor strength: at least 500 kg/m ²	
Standard accessories	Contact probes: 1172-19 (4 probes) (used for all arms), 4-terminal probes: 1172-46x4 (used for all arms) ^{*1} offset board 1350-02 (1 board), denting sheets (132 sheets included) 1134-02, support pin (3 pins), thermal mini-printer (includes 1 roll of paper) (1 unit), printer cable (USB) (1 cable), ball point driver (for affixing of rails) (1 driver) ^{*2} , grease (1 tube), grease gun (1 unit), instruction manuals (includes one of each of the following: Operator's Manual, Administrators Manual and Maintenance Manual), mouse pad (1 pad), computer peripherals (1 set), uninterruptible power supply (1 unit), set up CD (1 disk), adjusters (4 units), color display (17-inch) (one unit), power cable (uncrimped end, 3m) (1 cable), spare fuse (1 unit)	

^{*1} Only the FA1240-52 and FA1241-52 ship standard with 1172-46 4-terminal Probes.

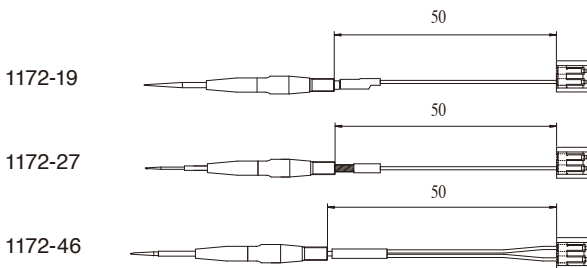
^{*2} Not included when equipped with the automatic width adjustment function option.

FA1240-51, FA1240-52, and FA1240-53 Common Transport System Specifications

Conveyor belts	Double-sided flat belts (antistatic material)
Conveyor width reference side	Front side
Transport height	900±15 mm
Conveyor speed	Max. 40 m/min (no-load conditions)
Direction of transport	Right to left or left to right (specify at time of order)
Supported range of board weights for transport	2.0 kgf or less
Supported range of board thicknesses for transport	0.6 mm - 3.2 mm

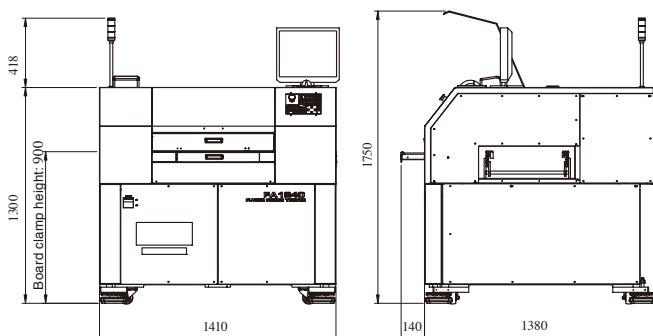
Note) ^{*1} Model FA1241-51/-52 is the CE Mark compliant version of Model FA1240-51/52.

External dimensions

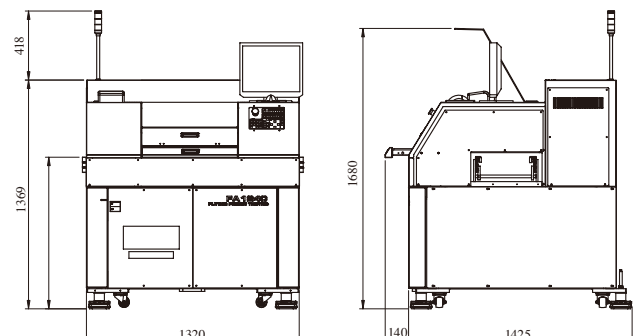


FA1240-51/-52

*FA1241-51/-52 dimensions are the same as those of the FA1240.



FA1240-53



POINT 1 Active testing (optional feature)

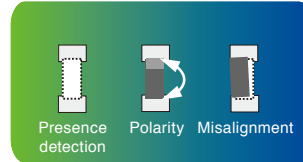
1. Determination of operational status of FETs
2. Measurement of relay contact resistance
3. Measurement of voltage generated by three-terminal regulators
4. Function feature voltage measurement (separate option)

Make basic operational inspections at the component level.



POINT 2 Visual testing (optional feature)

The board alignment CCD camera, which is standard equipment on the FA1240, can be used to test components that cannot be measured using electrical testing, dramatically reducing the need to rely on visual inspections. Visual mode supports chip component detection and polarity testing, while alignment mode augments component detection and polarity testing with misalignment testing. A component alignment camera (optional) can be added to enable testing of components other than chips such as ICs.



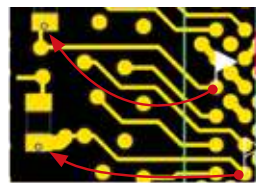
In addition to automatic alignment and visual testing, the FA1240 offers other features that take advantage of the CCD camera.

Actual CCD camera image

POINT 3 BGA Foot Float / S/O Testing

Automatically move to inspection points which are hidden in parts (Makes even SOJ testing simple)

When paired with the UA1780, the FA1240 can automatically move to hidden inspection points such as BGA and also configure the pin placement order. In addition, by optimizing the efficiency of the FA1240's automatic debugging function (ATG)* via net information, a more reliable inspection program can be created in a shorter amount of time.



BGA point replacement processing

POINT 4 Automatic debugging function (ATG)

Leave the device to automatically perform simple debugging

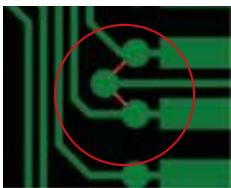
If component connection (net information) data is available, the software will be able to automatically select test conditions while taking that data into account.

Perform actual testing and production, from simple parallel and serial processing to guard settings which take into consideration probe specification. Dramatically reduces the amount of time spent by skilled users on debugging work while viewing circuit diagrams.

POINT 5 FAIL VISUALIZER UA1782

Detection of solder bridges between adjacent nets

Increasingly high-density component mounting makes solder bridges more likely to occur. In most cases, the solder bridge occurs at a position which is distinct from the test point touched by the probe. When combined with the UA1780 or UA1782 the software will be able to easily test closely spaced locations other than component pins that are at risk for bridge formation, for example between adjacent SMT components that have been mounted closely together and between adjacent through-holes following a wave soldering process.



Automatic detection of adjacent points



Adjacent SMT components

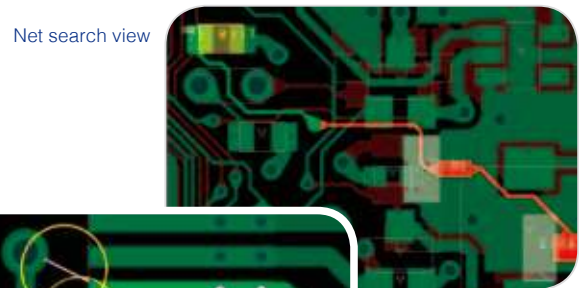


Adjacent through-holes

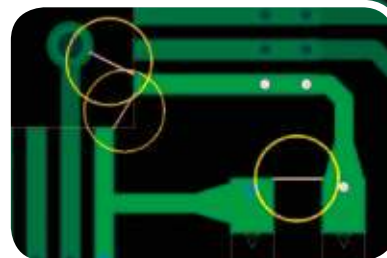


Physically close features

Rich viewer functionality supports repair work



Net search view



Proximity check view

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HIOKI

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