Maintenance Manual

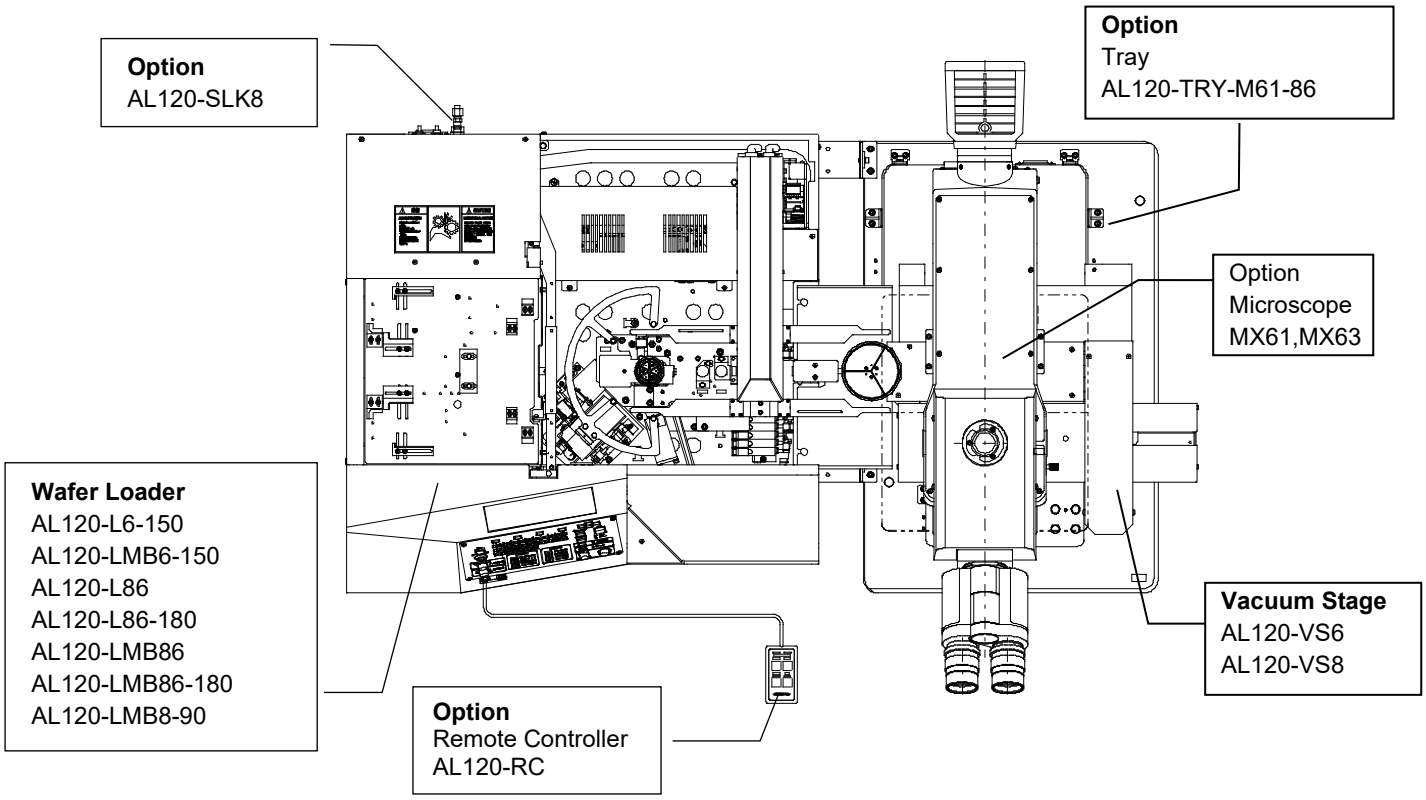
Wafer Loader

AL120-6Series
AL120-86Series

Thank you for purchasing the EVIDENT AL120 Series Wafer Loader.
In order to fully utilize its performance and secure safety, please read this manual before operation.
Please also keep it at hand during operation as well as for future reference.
This manual is exclusively for maintenance service engineer.
Please also keep it at hand during operation as well as for future reference.

AX7834-06

i Introduction



AL120 Series Lineup

AL120 series products consist of a model name and an applicable wafer size.

Note that only the AL120 series products with the same wafer size can be combined.

(The remote controller is common to all the AL120 series products.)

Series name	Model name	Wafer size	Wafer thickness
AL120-	**LMB**	**6**	**-150**

L: Microscope Loading
LMB: Microscope Loading, Top Macro Inspection and Back Macro Inspection
VS: Vacuum Stage

150:Loading of 150 μm-thick wafers
180:Loading of 180 μm-thick wafers
90: Loading of 90 μm-thick wafers

6: Loading of 150mm wafers
86: Loading of 200mm and 150mm wafers

	L6-150	LMB6-150	L86	L86-180	LMB86	LMB86-180	LMB8-90
Applicable wafer size	150 mm	150 mm	150/200 mm	150/200 mm	150/200 mm	150/200 mm	200 mm
Orientation flat alignment	Available	Available	Available	Available	Available	Available	Available
Top Macro inspection	N. A.	Available	N. A.	N. A.	Available	Available	Available
Back Macro inspection	N. A.	Available	N. A.	N. A.	Available	Available	Available
2nd Back Macro inspection	N. A.	Available	N. A.	N. A.	Available	Available	Available
Microscope	Available	Available	Available	Available	Available	Available	Available

The AL120 series consists of a wafer loader, a vacuum stage, and other products.

This manual does not cover custom-order specifications or microscopes.

To acquire a comprehensive understanding of both your loader and microscope, please refer to your microscope operation manual.

You must prepare yourself the table on which the loader is to be installed and the cassettes and wafers to be inspected and loaded by the loader.

This loader is designed to maximize its operability when it is installed on a table with a height of 700 mm.

The operability is designed based on the SEMI Standard S8.

Our company's designed operability is not guaranteed if the loader is installed on a table that does not satisfy the conditions specified above.

Please refer to the SEMI Standard S8 to select a table.

1. Precautions

Operators must follow the instructions in the Operation/Maintenance Manual. If these instructions are not followed, safety can not be assured, and malfunctions may occur.

The following 3 types of symbols are used in this Manual to draw operators' attention.

: Indicates critical advice in order to protect operators from injury as well as to protect the loader (including its peripherals) from damage.

: Indicates a cautionary advice to protect the loader from damage.

: Indicates useful information for operation.

2. Safety Precautions

1. **Use the loader within the scope of the specifications.**
2. **Use only the EVIDENT power cord provided with the loader.**
   Otherwise the safety performance of the loader can not be assured.
3. **The power cord plug must be easily accessible at any time. Immediately unplug the power cord if you find any abnormalities in the loader.**
4. **Bind wires and tubes to table legs and the like to prevent them from catching your feet.**
5. **Be sure to ground the loader. Otherwise our intended electric safety performance of the loader cannot be assured.**
6. **Never put any metallic objects in the vent. This could cause an electric shock or malfunction.**
7. **Place the loader and the microscope on a sturdy and level table (with a tilt angle of no more than 1 degree).**
8. **Wear gloves when clearing broken wafers.**
9. **Wafers under inspection could fall down when the vacuum supply is stopped. The check valve and buffer tank should be connected to maintain a vacuum even when the vacuum supply is stopped. Buffer tank and the check valve are not attached to Wafer Loader. When it is necessary, please contact it to nearest EVIDENT distributor.**
10. **Wafers could fall down if you touch them or apply a force to them during inspection. Do not touch wafers during inspection.**
11. **Undergo maintenance training before attempting to do maintenance on the loader.**
12. **Consult your nearest EVIDENT distributor if you need to move the loader.**
    (The loader weight is approximately 44kg.)
13. **Down flow that may cause a wafer to shake may cause the wafer transfer operation to be accompanied by physical danger. Take care that the wafer transfer operation is performed at a location where there is no such down flow.**
14. **Use a cassette that complies with the SEMI standard. If a deformed cassette is used, there is an increased risk of a wafer being damaged.**

15. To get the best performance from this loader, make sure that there is at least the space shown below (with dimensions in [ ]) around the loader during assembly and installation.

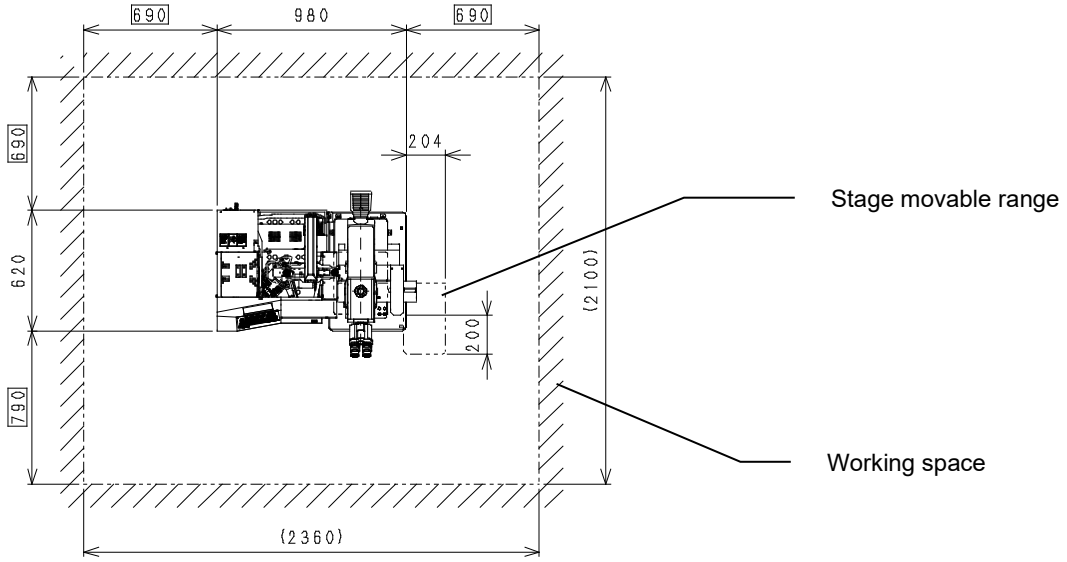
•The dimensions indicated by the dot-dot-dash lines show the stage's movable range.

•You can get more working space during maintenance or other work by changing the observation tube mounting direction and moving the stage.

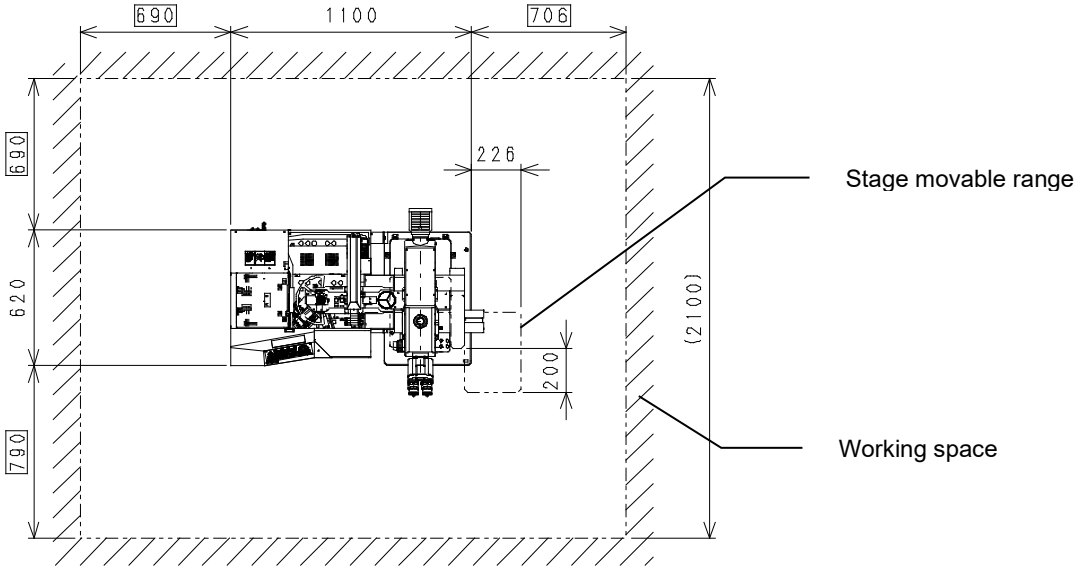
•This installation space is determined according to the SEMI guideline (SEMI S8-0308). Provide adequate space for operating the loader according to your intended use by referring to the installation space and outer dimensions shown on the next page.

Installation space

AL120-6 Series Unit: mm

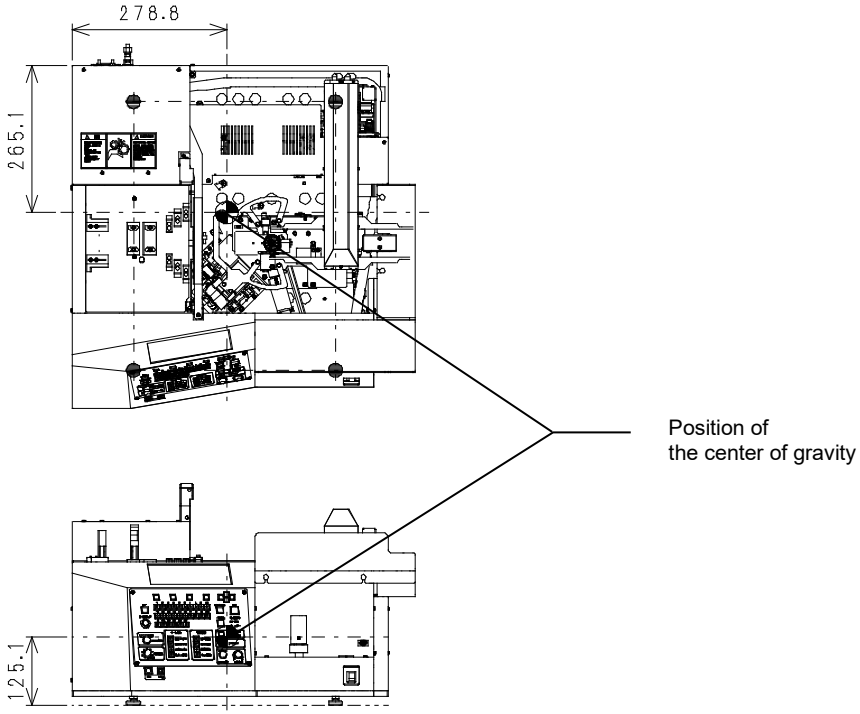


AL120-86 Series Unit: mm

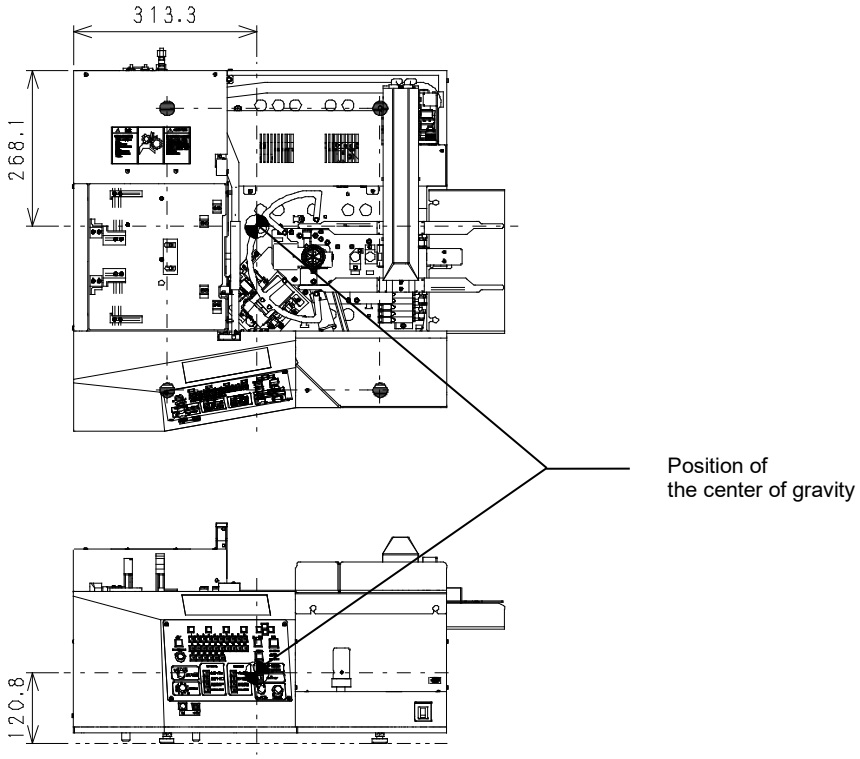


Position of the Center of Gravity

AL120-6 Series



AL120-86 Series

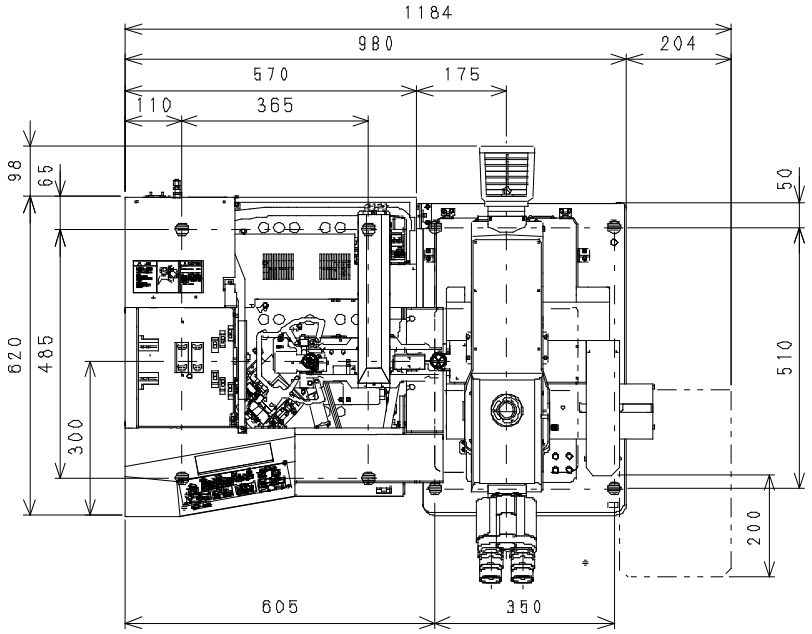


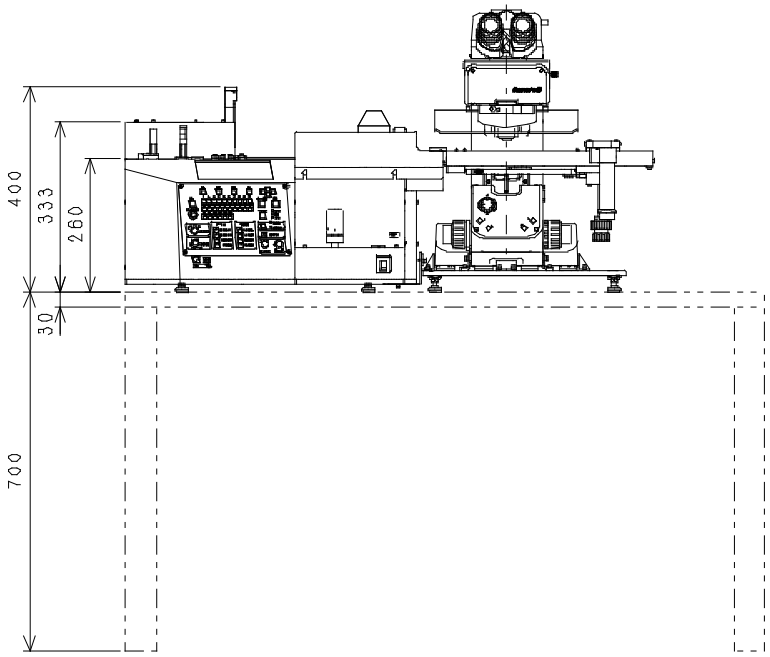
Working Environment

Please prepare the table for the equipment at your side.
This equipment is designed so as to show the best performance in being set on the table of which height is approx. 700mm and thickness of work surface is more than 22mm.
This equipment is designed in accordance with the SEMI S8 standard.
If any other tables are selected, the best performance can not be assured.
When selecting the table, please refer to the SEMI S8 standard.

Part Dimensions

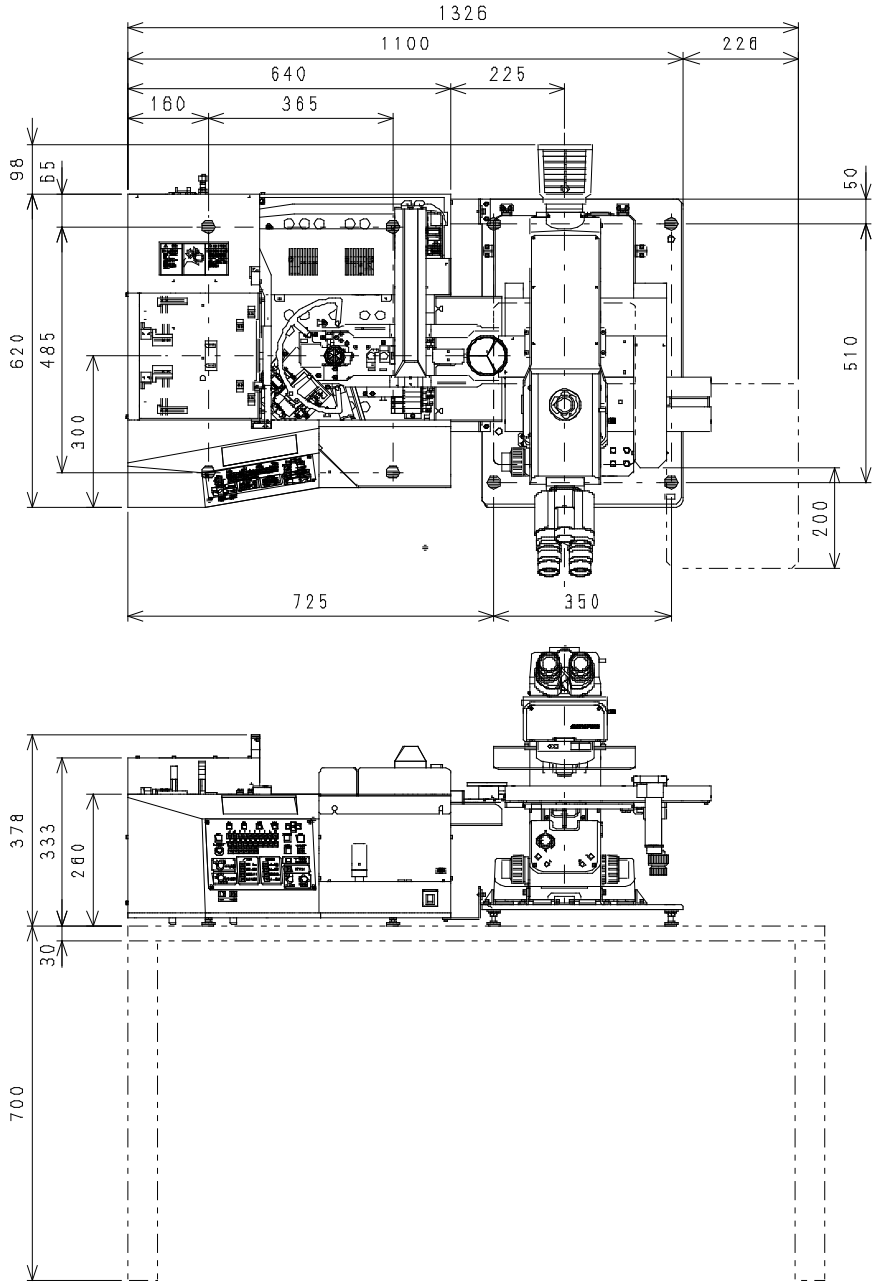
AL120-6 Series Unit: mm





AL120-86 Series

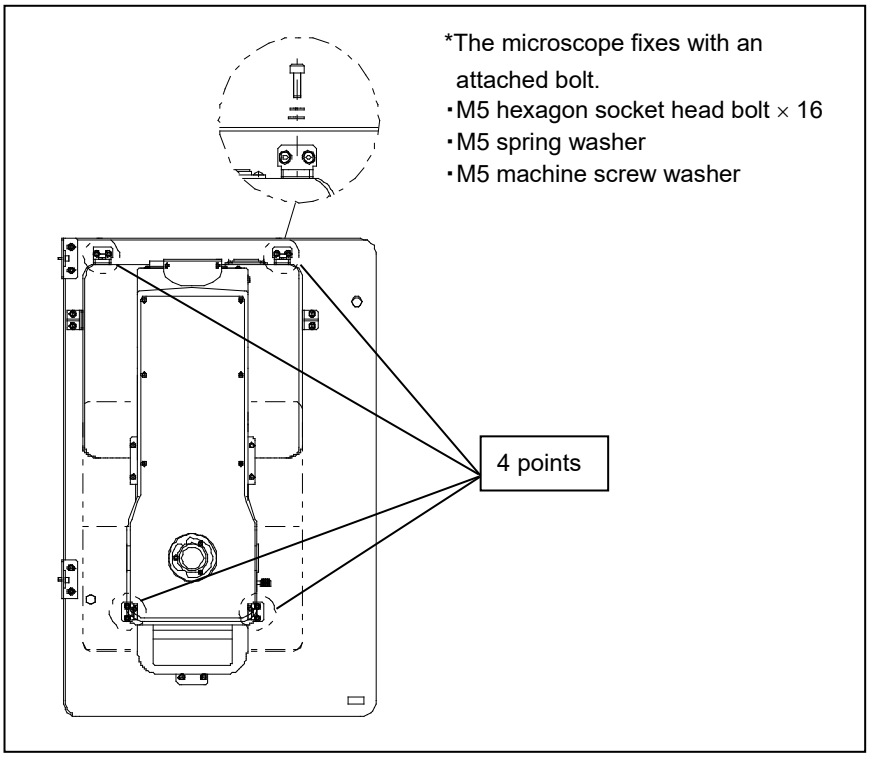
Unit: mm



Earthquake Protection

(1) This loader should be secured to prevent it from falling off the table when an earthquake occurs.

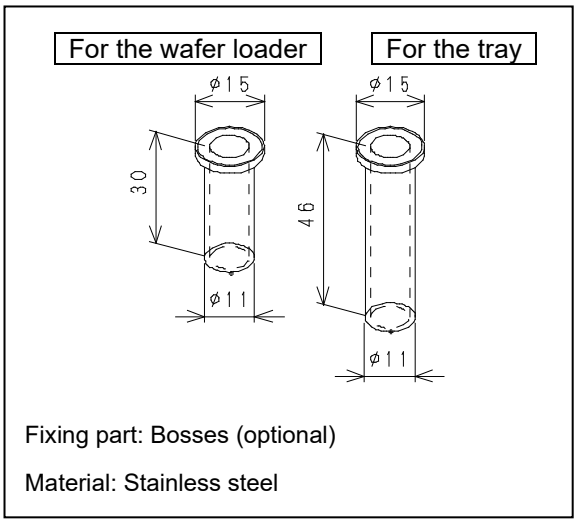
1.The fixation method of the microscope

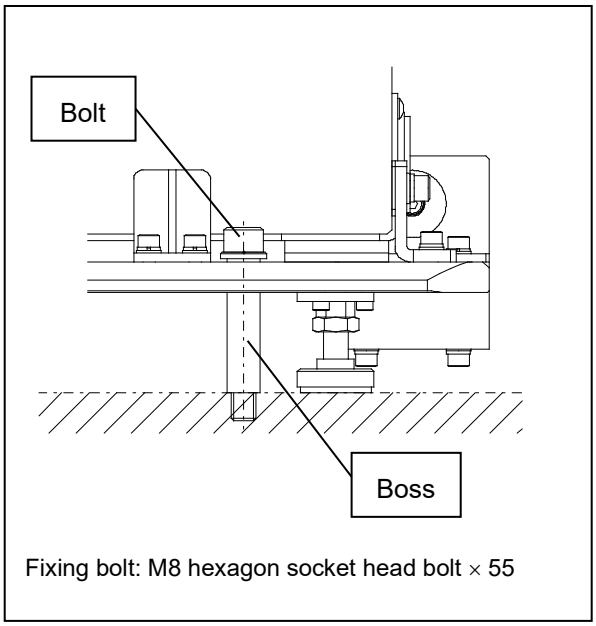


2.The fixation method of the Tray(AL120-TRY-M61-86) and Wafer Loader

The Tray(AL120-TRY-M61-86) and Wafer Loader has the holes for fixing the equipment.
Please fix the equipment on the tray and Wafer Loader not to be moved by unexpected force such as earthquake.
Use two M8 steel bolts and boss through the holes provided to secure the Tray and Wafer Loader to supporting surface (table etc.)

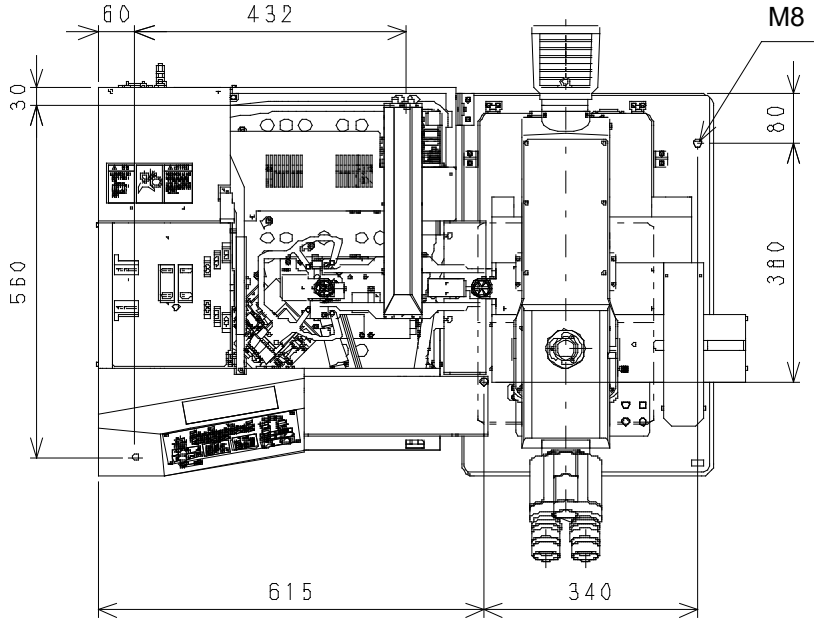
Fixing part (Recommended dimensions)



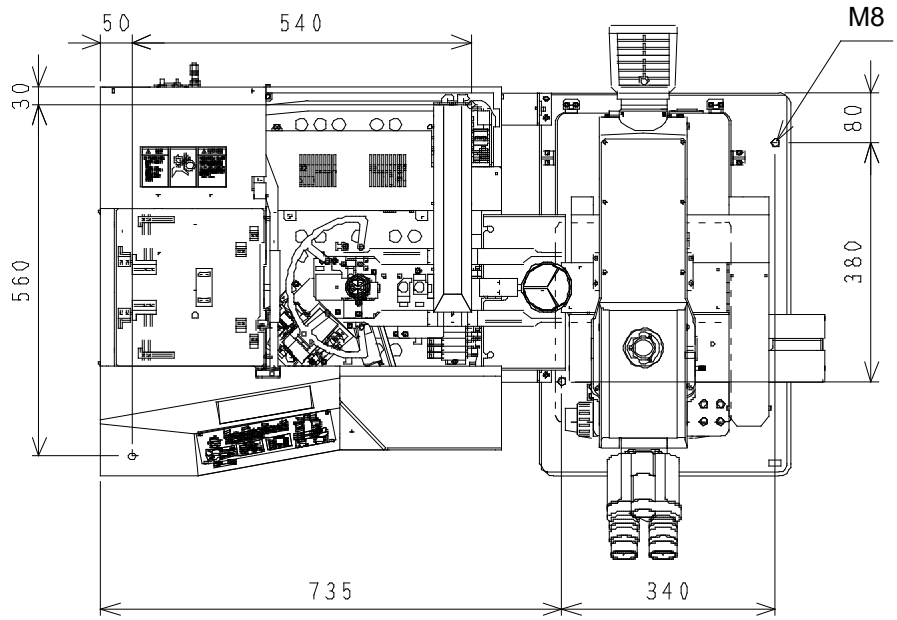


Fixed taps(M8) position dimensions

AL 120-6 Series



AL 120-86 Series



Safety Symbols

The following symbols are affixed to this loader.

In order to safely operate this loader, be sure to familiarize yourself with the meanings of individual symbols.

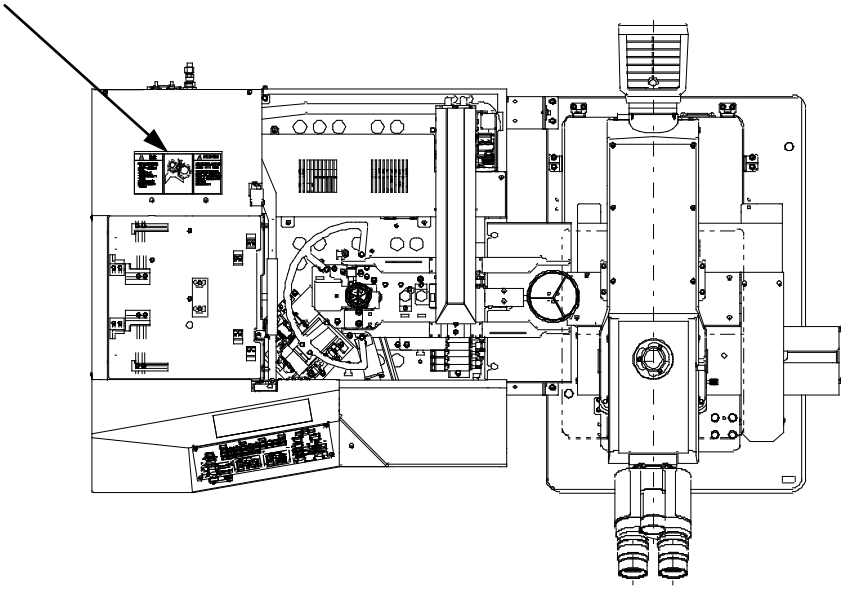
	Keep fingers clear.
I	Main switch is ON.
O	Main switch is OFF.

Warning Indication

The warning indication is attached on the part to which you need to pay attention to ensure safety when operating/using the loader. Strictly follow the instructions.

CAUTION
MECHANICAL HAZARD
CONTACT TO MOVING PARTS OF THE MECHANISM MAY RESULT IN SEVERE INJURY.
KEEP HANDS AND GARMENTS CLEAR OF MOVING PARTS.
CONSULT MANUAL FOR PRECAUTIONS DURING MAINTENANCE.

Position of warning indication label



If this warning label becomes dirty or peels off, contact your nearest EVIDENT distributor for replacement and servicing.

3. Before Starting Operations

In order to get the best performance from the loader, as well as to ensure safety, please follow the 3 points listed below.

1. Never put your hands in the loader.
2. Do not deliberately place wafers or other objects in or remove from the loader while it is in operation.
If excess force is applied to the wafer under inspection, it could lose its adhesiveness and could be damaged.
3. Make sure that the main switch is turned off before removing a wafer for unavoidable reasons such as malfunctions.

4. Maintenance and Storage

Make sure that the main switch is turned off and the power cord is unplugged before doing any of the following operations.

1. Wipe each part of the loader using a soft cloth moistened with pure water.
Wipe heavy dirt or stains with a clean paper moistened with commercially available absolute alcohol.
Never place absolute alcohol close to a flame as it is highly flammable.
Take care not to cause sparks by turning on or off an electric appliance or fluorescent lamp.

2. Wear gloves to protect your hands while cleaning the loader when for example a wafer is damaged.

3. Periodically check the loader for wear (a wafer loading arm and deterioration of the drive mechanism), and replace the parts as needed. Contact your nearest EVIDENT distributor for repair.

1. Never disassemble the loader unnecessarily. This could affect the performance and function of the loader.

2. Contact your nearest EVIDENT distributor if you need MSDS.

3. Confirm and observe your local municipal ordinances or regulations when you dispose of the loader.
If you have any questions, contact your nearest EVIDENT distributor.

4. Lenses and solders used by this system are lead-free.

5. Daily Check

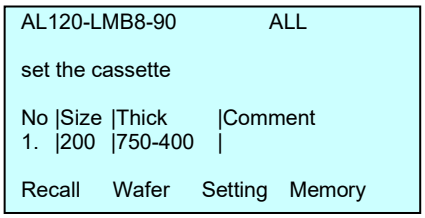
1. Confirm the following points before operating the loader.

(1) Vacuum supply pressure: -67KPa to -80KPa
When there are not a vacuum gauge and a regulator, please contact it to the EVIDENT distributor.

(2) Make sure that there are no wafers or tools inside the wafer loader

2. Confirm the following points before starting the inspection.

(1) Make sure that the power is on (Check the liquid crystal panel)
Turn the main switch ON and make sure that each arm position is initialized and the model name is shown on the liquid crystal panel.
The loader may have been set to skip initialization when the power is turned on. This is not a malfunction. The loader executes initialization when the [Start] button is pressed.



(2) Check the loader stop button
Press the loader stop button and make sure that the loader stops operation.

6. Conformity Standards

(1) This equipment is carrying out conformity or evaluation to the following standard.
(2) Although this equipment aims at using in the industrial environment, since it may not satisfy a performance when not used by the right operation method, please carry out the proper handling according to this manual.

This equipment is an object for industrial environment (Class A). Other equipment may be affected if it is used in a housing environment.

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, use, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC WARNING:
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

SEMI

This equipment is carrying out evaluation to the guideline of the following SEMI standard.

- S2-0706: Safety Guidelines for Semiconductor Manufacturing Equipment
- S8-0308: Safety Guidelines for Ergonomics Engineering of Semiconductor Manufacturing Equipment

■ PROPER SELECTION OF THE POWER SUPPLY CORD

If no power supply cord is provided, please select the proper power supply cord for the equipment by referring to " Specifications " and " Certified Cord " below:

CAUTION: In case you use a non-approved power supply cord for Olympus products, Olympus can no longer warrant the electrical safety of the equipment.

Specifications

Voltage Rating	125V AC (for 100-120V AC area) or, 250V AC (for 220-240V AC area)
Current Rating	6A minimum
Temperature Rating	60°C minimum
Length	3.05 m maximum
Fittings Configuration	Grounding type attachment plug cap. Opposite terminates in molded-on IEC configuration appliance coupling.

Table 1 Certified Cord

A power supply cord should be certified by one of the agencies listed in Table 1 , or comprised of cordage marked with an agency marking per Table 1 or marked per Table 2. The fittings are to be marked with at least one of agencies listed in Table 1. In case you are unable to buy locally in your country the power supply cord which is approved by one of the agencies mentioned in Table 1, please use replacements approved by any other equivalent and authorized agencies in your country.

Country	Agency	Certification mark	Country	Agency	Certification mark
Argentina	IRAM		Italy	IMQ	
Australia	SAA		Japan	JET	
Austria	ÖVE		Netherlands	KEMA	
Belgium	CEBEC		Norway	NEMKO	
Canada	CSA		Spain	AEE	
Denmark	DEMKO		Sweden	SEMKO	
Finland	FEI		Switzerland	SEV	
France	UTE		United Kingdom	ASTA BSI	
Germany	VDE		U.S.A.	UL	
Ireland	NSAI				

Table 2 HAR Flexible Cord

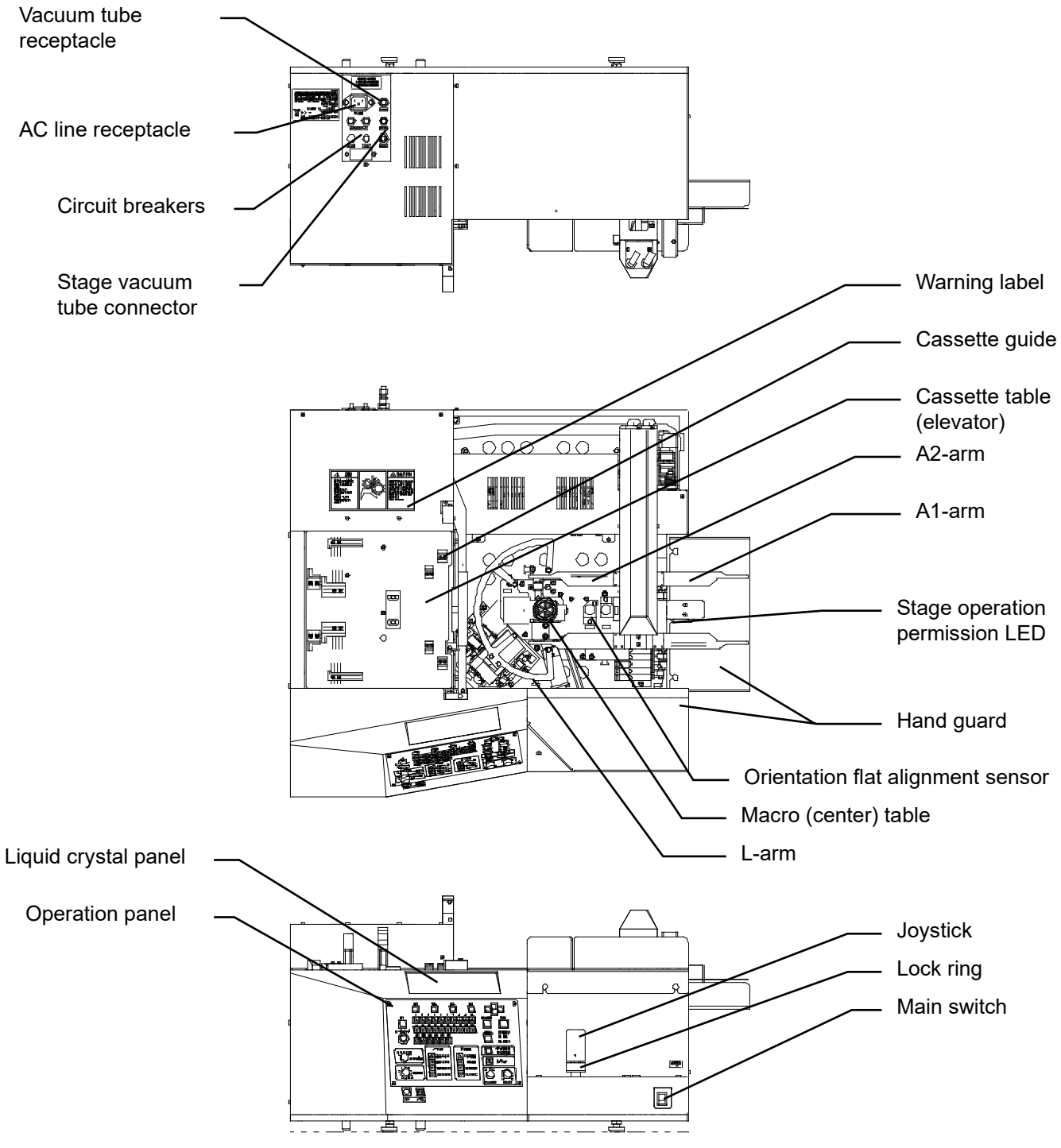
APPROVAL ORGANIZATIONS AND CORDAGE HARMONIZATION MARKING METHODS

Approval Organization	Printed or Embossed Harmonization Marking (May be located on jacket or insulation of internal wiring)	Alternative Marking Utilizing Black-Red-Yellow Thread (Length of color section in mm)		
		Black	Red	Yellow
Comite Electrotechnique Belge (CEBEC)	CEBEC ‹HAR›	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	‹VDE› ‹HAR›	30	10	10
Union Technique de l'Electricite´ (UTE)	USE ‹HAR›	30	10	30
Instituto Italiano del Marchio di Qualita´ (IMQ)	IEMMEQU ‹HAR›	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC ‹HAR›	10	10	30
N.V. KEMA	KEMA-KEUR ‹HAR›	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO ‹HAR›	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	‹ÖVE› ‹HAR›	30	10	50
Danmarks Elektriske Materialkontroll (DEMKO)	‹DEMKO› ‹HAR›	30	10	30
National Standards Authority of Ireland (NSAI)	‹NSAI› ‹HAR›	30	30	50
Norges Elektriske Materiellkontroll (NEMKO)	NEMKO ‹HAR›	10	10	70
Asociacion Electrotecnica Y Electronica Espanola (AEE)	‹UNED› ‹HAR›	30	10	70
Hellenic Organization for Standardization (ELOT)	ELOT ‹HAR›	30	30	70
Instituto Portages da Qualidade (IPQ)	np ‹HAR›	10	10	90
Schweizerischer Elektro Technischer Verein (SEV)	SEV ‹HAR›	10	30	90
Elektriska Inspektoratet	SETI ‹HAR›	10	30	90
Underwriters Laboratories Inc. (UL)	SV, SVT, SJ or SJT, 3 X 18AWG			
Canadian Standards Association (CSA)	SV, SVT, SJ or SJT, 3 X 18AWG			

Table of Contents

1 Nomenclature

1-1 Wafer Loader Main Body

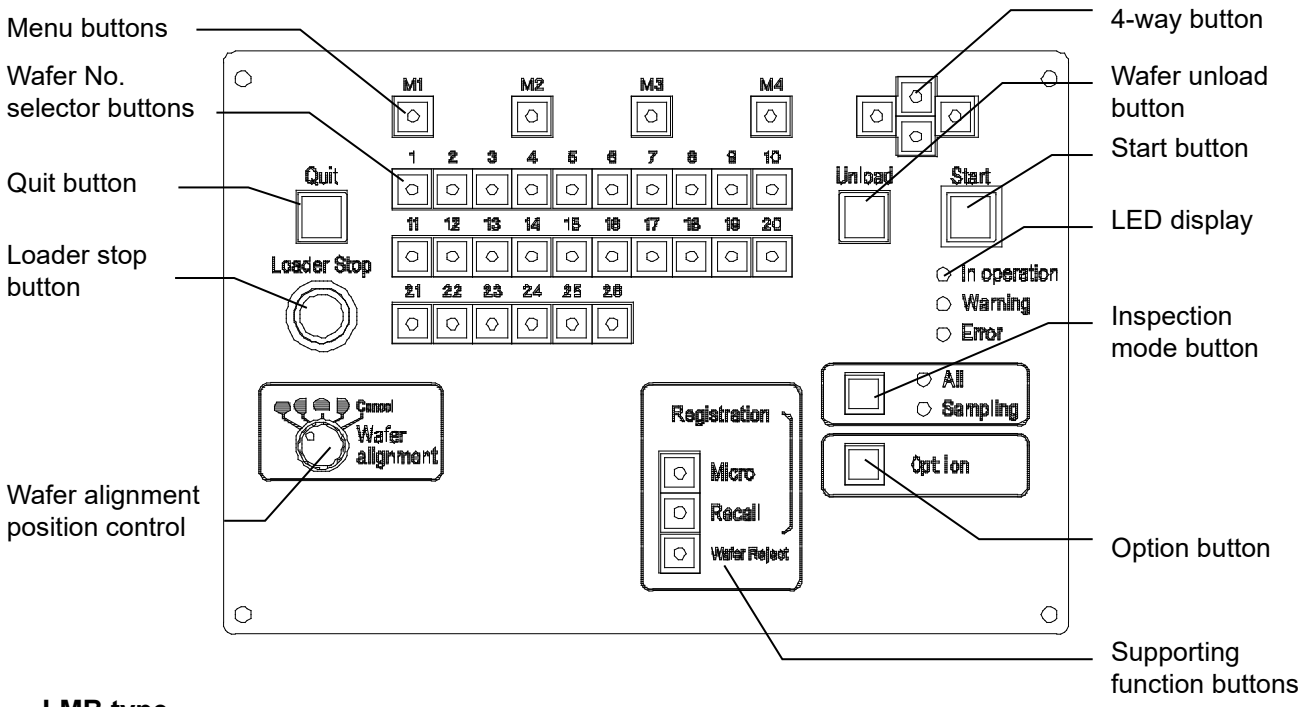


Your loader may not have all the units shown in the Figure.

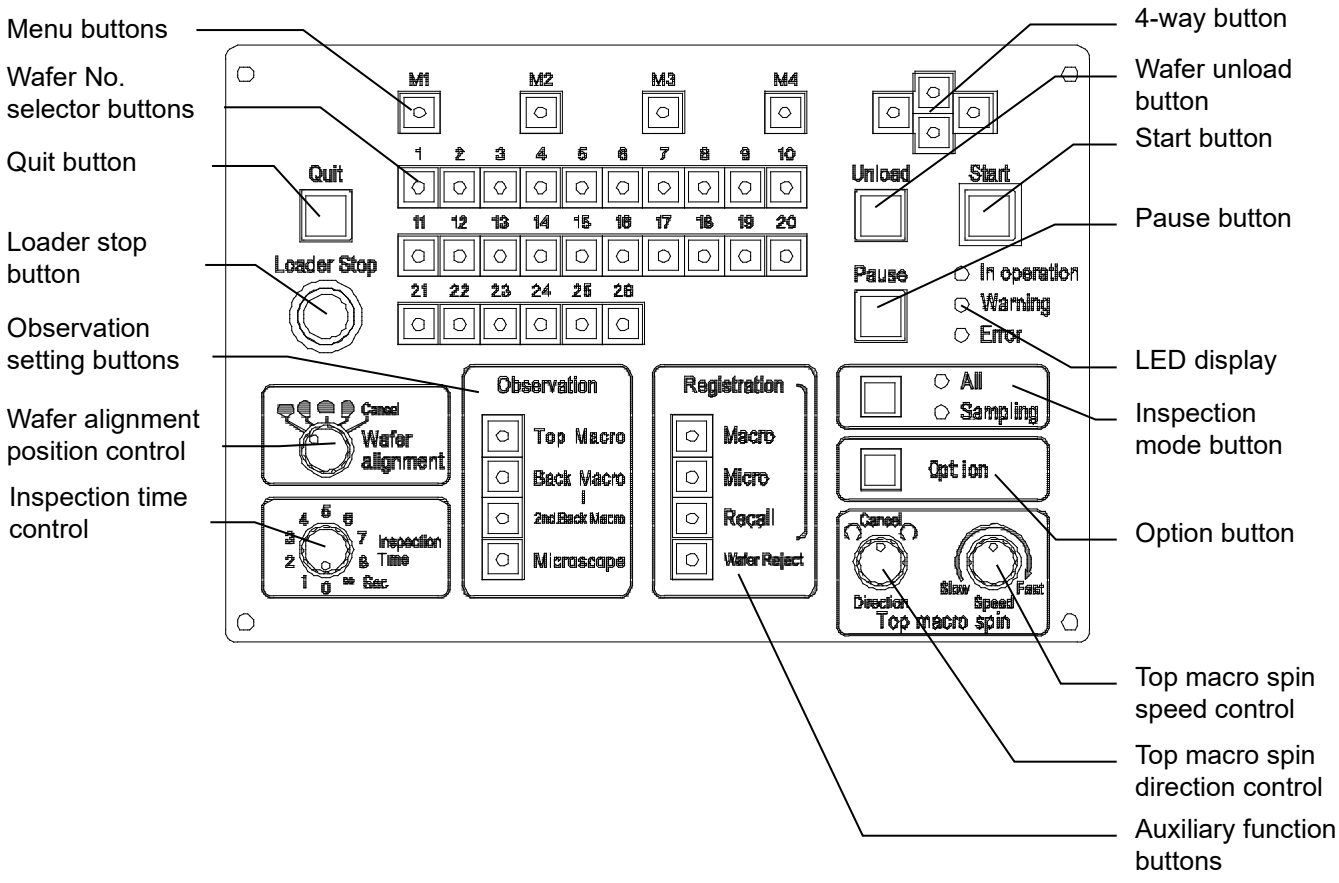
*The L-arm and the joystick are integrated in the LMB models.

1-2 Operation Panel

L type

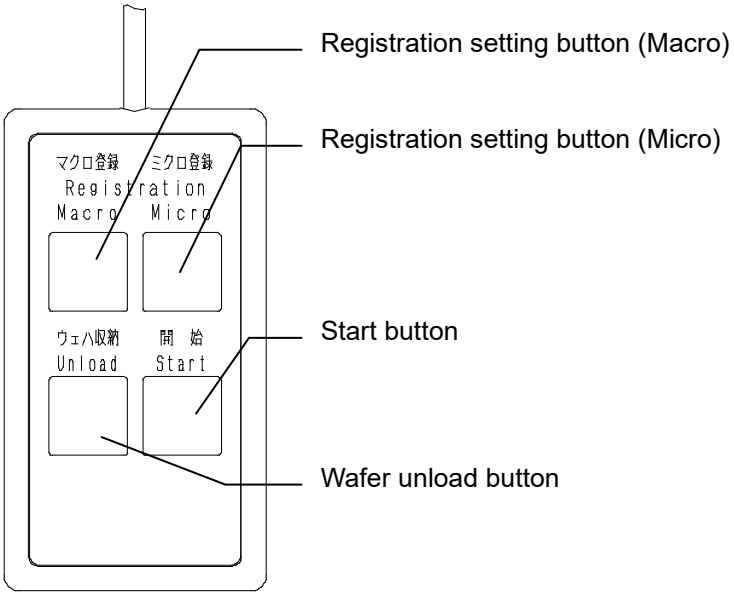


LMB type



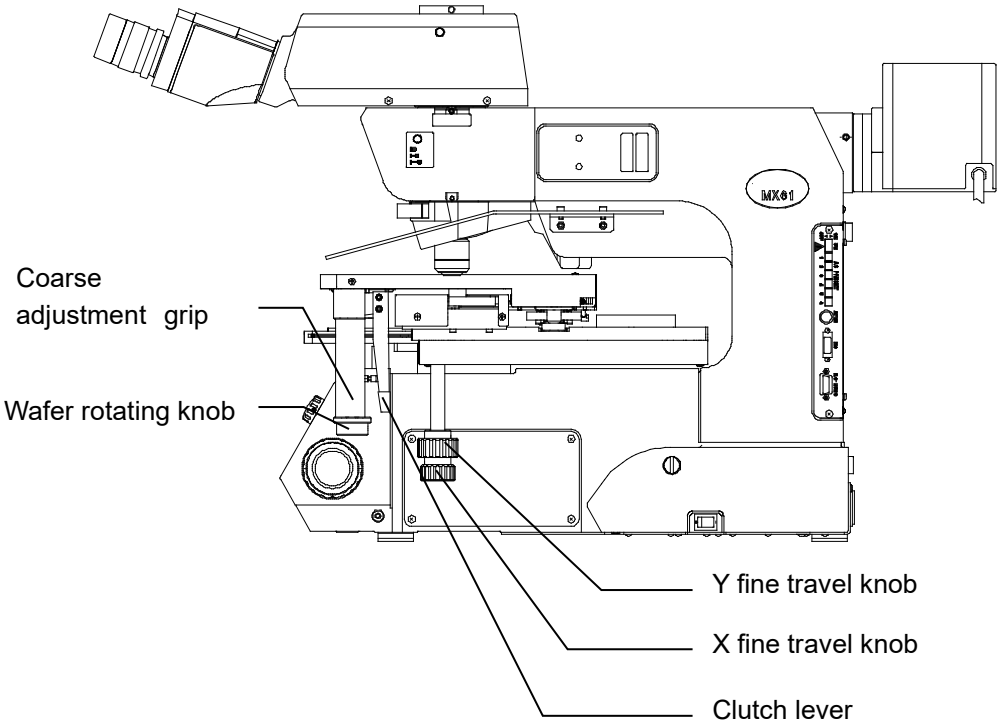
1-3 Remote Controller (Option)

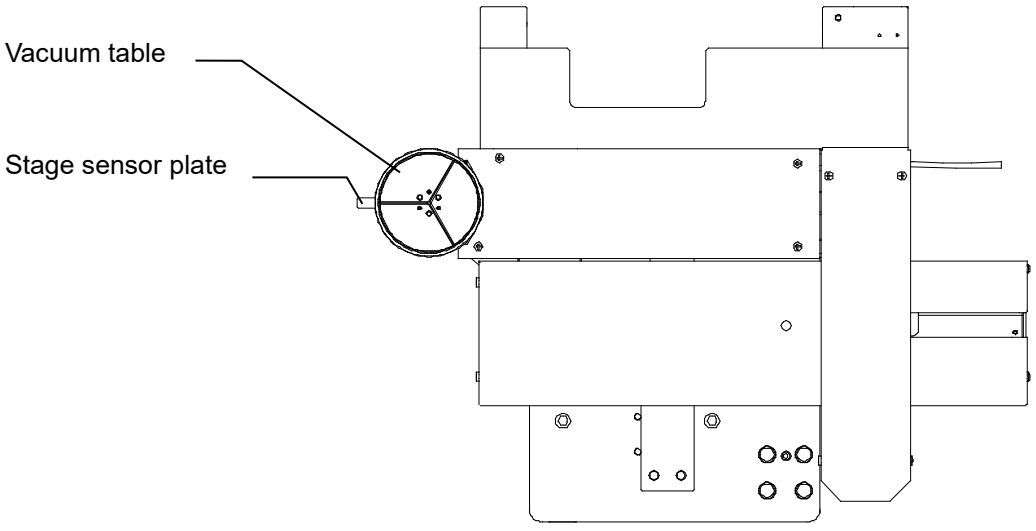
Remote controller: AL120-RC



1-4 Vacuum Stage

Vacuum stage: AL120-VS6/AL120-VS8



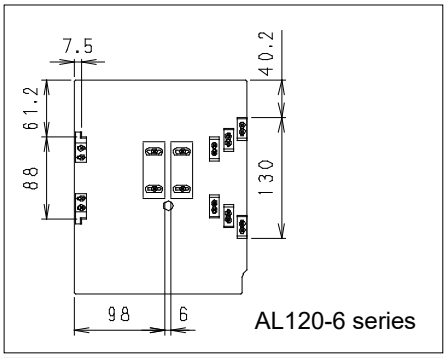


2 Adjustments

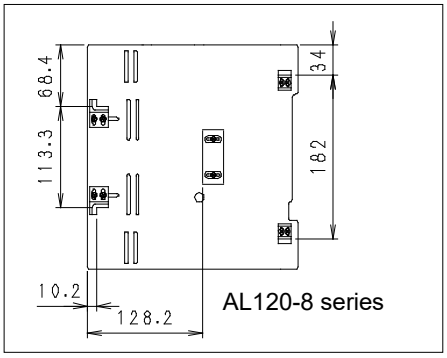
The loader requires adjustments when the cassette is changed or the thickness of the wafers to be inspected is changed.

If the loader is used without any adjustment to the proper state, it may give damage to wafers. Receive the training of loader maintenance before making adjustments. To prevent danger, be sure to turn the main switch OFF and disconnect the power cord before removing the cover for adjustment work.

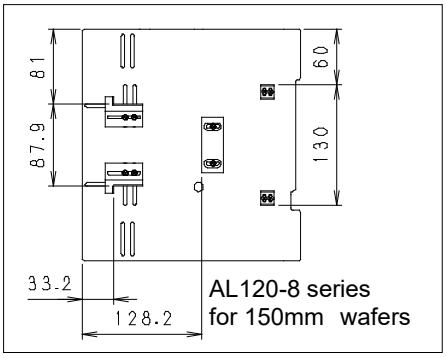
1 Adjusting the Cassette Positioning Guide Position



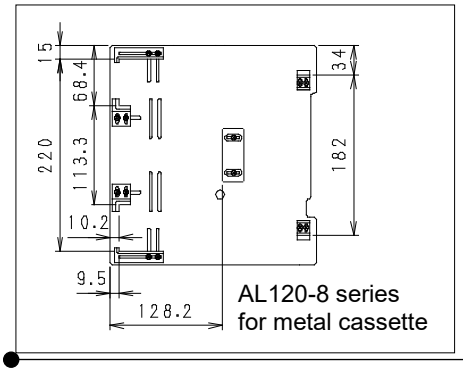
AL120-6 series



AL120-8 series



AL120-8 series
for 150mm wafers



AL120-8 series
for metal cassette

Tools

Phillips-head screwdriver (No. 2)

The clearance between the cassette guide and your cassette may be inappropriate. Adjust the guide as appropriate for your cassette.

* If a cassette is used with insufficient clearance between the cassette and the cassette guide, the cassette will lift up and wafers may interfere with the arms during inspection.

* If a cassette is used with too great a clearance between the cassette and the cassette guide, the cassette may interfere with wafers.

Proper clearance between cassettes and the guide: Approx. 0.5 mm
(Adjust clearance to a value that takes into account variations of the cassettes to be used.)

1) Loosen the cassette guide fixing screws.
   Caution: Do not remove the screws. If all screws are removed, the fixing nuts will drop into the loader.
2) Set the cassette at the center of the cassette table so that the wafer is positioned in the cassette as shown at the left.
3) Move the guide so that the clearance between the cassette guide and the cassette is approx. 0.5 mm, and tighten the guide fixing screws.

2 Registration of a New Type of Inspection Wafer (Cassette to be Used and Wafer Thickness)

2-1. Main Operating Procedure

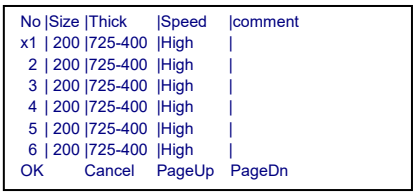
Prepare the cassette and wafer to be registered, and adjust and register them using the following procedure.

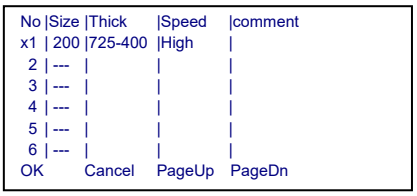
1) Activate adjustment test mode
2) Test 24 wafer type setting registration
3) Test 12 wafer mapping parameter setting registration
   Items to prepare Insert the wafers to be registered in the lowest and highest slots of the cassette.
4) Test 12 wafer mapping parameter confirmation
   Items to prepare Insert the wafers of the same thickness to be confirmed into all slots of the cassette.
5) Test 11 elevator height (arm insertion and removal height) setting registration
   Items to prepare Insert the wafers of the same thickness to be confirmed into all slots of the cassette
6) Quit adjustment test mode

2-2. Operating Procedure

1) Activate adjustment test mode
   Turn the main switch OFF.
   Turn the main switch ON while pressing the Wafer No. selector buttons [1] and [2].

2) Wafer type setting registration
   Using Test 24, specify the wafer size, thickness, transfer speed, comment to be registered.





*Indication example when registering only one kind

① Press the Wafer No. selector button [24], then press the [Start] button.
② The wafer types currently registered are displayed on the liquid crystal panel.
   Using the 4-way button, move the <x> to the item to add or change or deletion, then press the 4-way button [RIGHT].
③ Specify the following items.
   - Wafer size <Size> : Select one of 200/150/125/100/---
   - Wafer thickness <Thick>: Select one of 725-400/400-180/180-90
   - Transfer speed <Speed> : Select one of Fast/Middle/Slow/SP1–SP5
   - Comment <Comment> : Input of a maximum of 16 characters is possible.

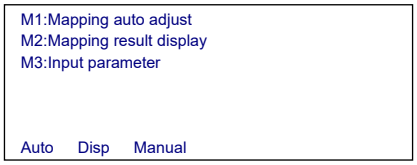
   * Refer to Section 4 Test Mode for detailed procedures.
   * There is a limit to selectable items, depending on the specifications of the loader.
   * When chose --- with a wafer size <size> column, the set point is deleted, and it is not displayed to a wafer type screen at the time of the inspection.

④ After settings are completed, press the [M1] button <Save> and store setting, press the [Quit] button to terminate Test 24.

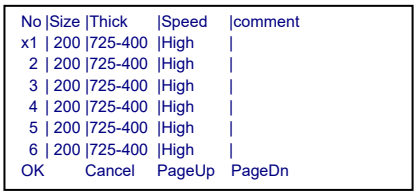
3) Wafer mapping parameter setting registration

Using Test 12, set the wafer mapping parameters according to the cassette state and the wafer thickness.

① Press the Wafer No. selector button [12], then press the [Start] button.



② The submenu appears on the liquid crystal panel.
[M1]: Executes the automatic mapping parameter adjustment <Mapping auto adjust>.
Press the [M1] button <Auto>.



③ The wafer types currently registered are displayed on the liquid crystal panel.
Using the 4-way button, move the <x> to the item to add, then press the [M1] button <Ok>.

④ Insert the wafers to be registered in the lowest and highest slots of the cassette, and set the cassette in the cassette table.

⑤ The menu appears on the liquid crystal panel.
[M1]: Do the mapping adjustment <Adjust mapping>.
Press the [M1] button <Adjust>.

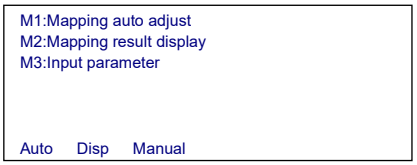
⑥ The elevator moves down to the lowest point, and then it moves up and stops at the upper limit.

⑦ If the display shows <result : OK> to indicate that the mapping data has no problems, press the [M2] <Save> button to register the data.
If the display shows NG (No Good), check the wafer insertion slot positions in the cassette.

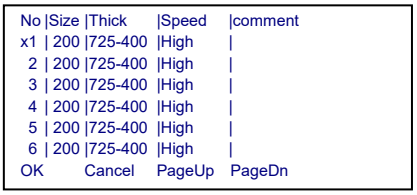
⑧ After the setting is completed, press the [Quit] button to terminate Test 12 [M1] automatic mapping parameter adjustment.

4) Checking the wafer mapping parameters

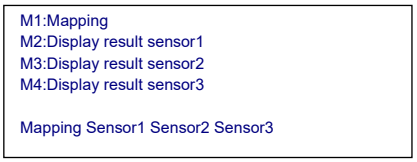
Check the wafer mapping parameters setting state using Test 12.



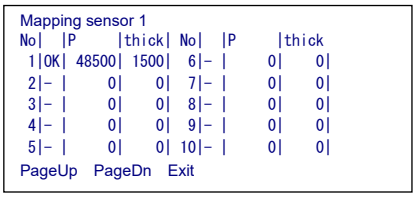
① From the submenu on the liquid crystal panel, execute [M2] <Mapping result display>.
Press the [M2] button <Disp>.



② The list of wafer types currently registered are displayed on the liquid crystal panel.
Using the 4-way button, move the <x> to the item to add, then press the [M1] button <Ok>.



③ Insert wafers to be registered into all slots of the cassette, and set the cassette in the cassette table.
④ Press the [M1] button <Mapping>.
The elevator moves down to the lowest point, and then it moves up and stops at the upper limit.

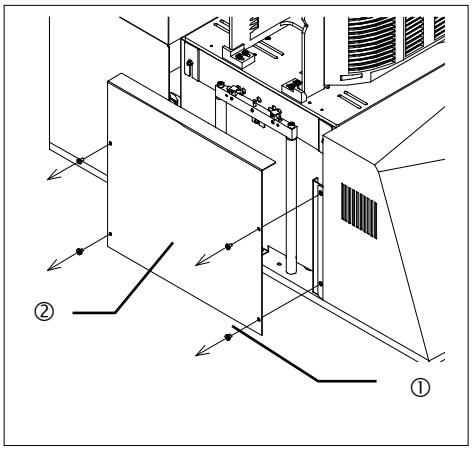


⑤ Press the [M2], [M3] and [M4] buttons to show the results on the liquid crystal panel.
[M1]: Executes mapping <Mapping>
[M2]: Displays the results of mapping sensor 1 (center) <Display result sensor1>
[M3]: Displays the results of mapping sensor 2 (far side) <Display result sensor2>
Applicable models: AL120-L/LMB86-180, LMB8-90
[M4]: Displays the results of mapping sensor 3 (near side) <Display result sensor3>
Applicable models: AL120-L/LMB86-180, LMB8-90

Make sure that all the slots for each sensor have indication of OK.
If there are any wafers with an “NG” indication, the wafer deflection value or the cassette pitch will vary widely.
Using Test 12 [M3]: Manual input of mapping parameters <Input parameters>, make a fine adjustment of the detection range.
* Refer to Section 4 Test Mode for detailed procedures.

5) Elevator height (arm insertion and removal height) setting registration

Preparation



Tools

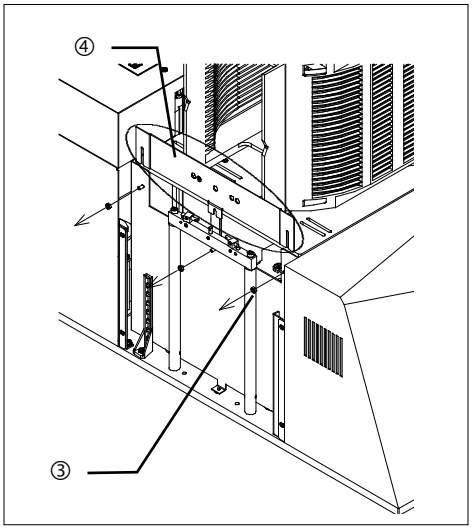
Phillips-head screwdriver (No. 2)

Hexagonal wrench (with an opposite side distance of 5.5 mm)

Items to prepare

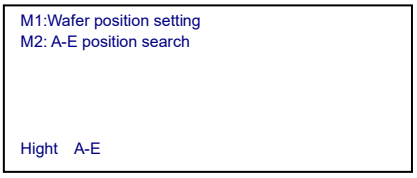
The cassette and wafers to be registered

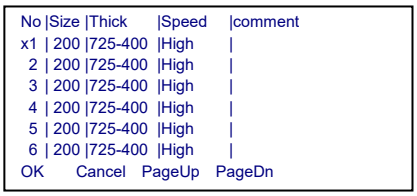
1) Turn the main switch OFF.
2) Remove the four M3 binding machine screws ① on the left side of the loader main unit. Remove the elevator cover ②.

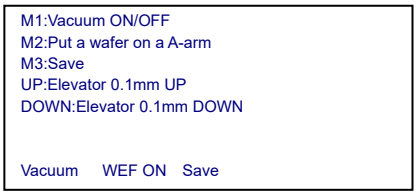


3) Loosen the three M3 hexagon nuts ③, and remove the partition plate ④.

Specify the elevator height by using Test 11.







① Press the Wafer No. selector button [11], then press the [Start] button.

② The menu appears on the liquid crystal panel.
Execute [M1]: Wafer removal height adjustment <Wafer position setting>.
Press the [M1] button <Height>.

③ The wafer types currently registered are displayed on the liquid crystal panel.
Using the 4-way button, move the <x> to the item to add, then press the [M1] button <Ok>.

④ Insert wafers to be registered into all slots of the cassette, and set the cassette in the cassette table.

⑤ Using the Wafer No. selector button [13], specify the 13th slot and press the [Start] button.
The elevator goes down and stops at the specified removal height.

⑥ The A-arm goes up and the horizontal excitation turns OFF.

⑦ Insert the A-arm into the cassette manually.

⑧ Make fine adjustments of the arm insertion height. The elevator movement can be selected by using the 4-way button on the liquid crystal panel.
[UP]: Moves the elevator slightly up <UP: Elevator 0.1mm UP>
[DOWN]: Moves the elevator slightly down <DOWN: Elevator 0.1mm DOWN>
Adjust the elevator height so that the arm is inserted between the wafer to be removed (13th) and the wafer below it (12th).

⑨ Press the [M3]: Registration button <Save> to register the adjusted value.

⑩ Make fine adjustments of the wafer removal height.
Insert the A-arm into the cassette manually.
Switch the elevator movement using the menu buttons on the liquid crystal panel.
Press the [M2]: Removal height button <Put a wafer on a A-arm> to move the elevator down to the removal height.
Turn ON the [M1]: A-arm adsorption button.
Elevator movement can be selected by using the 4-way button on the liquid crystal panel.
[UP]: Moves the elevator slightly up <UP: Elevator 0.1mm UP>
[DOWN]: Moves the elevator slightly down <DOWN: Elevator 0.1mm DOWN>
Adjust the elevator height so that the outer circumference of the adsorbed wafer is positioned at the center of the cassette slot.

⑪ Press the [M3]: Registration button <Save> to register the adjusted value.

⑫ Check the states of the 2nd and 25th wafers in the same way.

6) Termination of adjustment test mode
Turn the main switch OFF to terminate test mode.

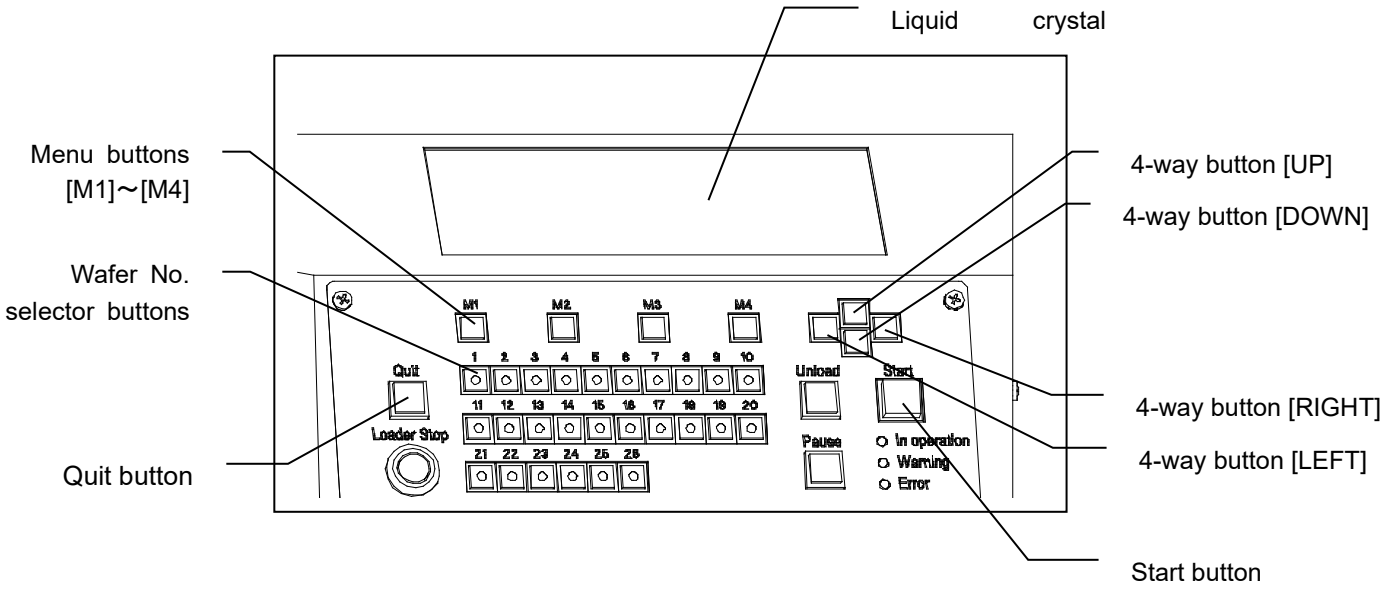
3 Test Programs

Test programs are used to check and adjust the functions of each unit.

Before initiating these programs, pay special attention to interference with the other units and make sure that there are no wafers left over from previous operations.

1 How to Use the Programs

1. Turn the main switch OFF.
2. Turn the main switch ON, while pressing the Wafer No. selector buttons [1] and [2].
   - The vacuums for the A-arm and the wafer on the stage are released.
   - If there is a wafer on the macro table or L-arm, a warning is displayed and the vacuum is maintained. (Macro table: W0005, L-arm: W0006)
     Press the [Start] button to turn the vacuum OFF. Use wafer tweezers to prevent the wafer from falling.
3. Select a test number with a Wafer No. selector button.
4. Press the [Start] button to initiate the test.
   The menu appears on the liquid crystal panel. Select specific items in the menu by manipulating the menu buttons, 4-way buttons, [Wafer No.] buttons, etc.



5. Press the [Quit] button test to terminate the test. (The loader enters the state in step 3.)
6. Turn the main switch OFF to terminate all the tests.

2 Test Names and Functions

1. Test names and test functions are shown in Tables 2-1 and 2-2, respectively.

Table 2-1: Test Programs

Button No.	Test Name	Remarks
1	Elevator vertical movement check	Applicable to all models
2	A-arm vertical movement check	Applicable to all models
3	A-arm horizontal movement check	Applicable to all models
4	A-arm rotation check	Applicable to all models
5	Macro table vertical movement check	LMB
6	L-arm vertical movement check	LMB
7	L-arm rotation check	LMB
8	Vacuum switch check	Applicable to all models
9	Stage lock check	Applicable to models equipped with AL120-SLK
10	Centering sensor count check	Applicable to all models
11	Elevator height adjustment	Applicable to all models
12	Mapping adjustment	Applicable to all models
13	A-arm origin sensor check	Applicable to all models
14	Centering transfer position check	Applicable to all models
15	Orientation flat and notch positions check	Applicable to all models
16	L-arm rotation origin sensor check	LMB
17	Stage transfer position adjustment	Applicable to all models
18	Unloading position adjustment	Applicable to all models
19	Centering adjustment (wafer unloading)	Applicable to all models
20	LED lamp check	Applicable to all models
21	Button operation check	Applicable to all models
22	Sensor check	Applicable to all models
23	Loader settings	Applicable to all models
24	Wafer type setting	Applicable to all models
25	Contact centering open/close movement check	Applicable to models equipped with AL120-CC
26	Software version and error log display	Applicable to all models

The AL120-CC contact centering unit is required to execute test No. 25.
The optional AL120-SLK is required to execute test No. 9.
Special jigs must be used to execute test Nos. 10 and 19. Contact your EVIDENT distributor from whom you purchased the loader.

Table 2-2: Test Functions

Test No./ Test Name	Function Outline
No. 1 Elevator vertical movement check	<Elevator movement check> ⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the elevator vertical movement. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the operation speed using the menu buttons on the liquid crystal panel. [M1]: High speed <Fast speed> [M2]: Medium speed <Middle speed> [M3]: Low speed <Slow speed> • If you do not specify anything here, the loader will operate at the high speed [M1]: High speed <Fast speed> setting. Press the [Start] button and the loader starts the operation. ① Upper limit ② Lower limit The loader then repeats steps ① and ②. • Press the [Start] button to pause the operation at the break point. • The speed can be changed during the pause. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the elevator returns to its initial position and the loader stops the operation.
No. 2 A-arm vertical movement check	<A-arm vertical movement check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the A-arm vertical movement. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the operation speed using the menu buttons on the liquid crystal panel. [M1]: High speed <Fast speed> [M2]: Medium speed <Middle speed> [M3]: Low speed <Slow speed> • If you do not specify anything here, the loader will operate at the high speed [M1]: High speed <Fast speed> setting. Press the [Start] button and the loader starts the operation. ① Lower limit → Upper limit ② Upper limit → Lower limit ③ Lower limit → Middle point ④ Middle point → Upper limit ⑤ Upper limit → Middle point ⑥ Middle point → Lower limit The loader then repeats steps ① to ⑥. • Press the [Start] button to pause the operation at the break point. • The speed can be changed during the pause. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the A-arm returns to its initial position and the loader stops the operation.
No. 3 A-arm horizontal movement check	<A-arm horizontal movement check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the A-arm horizontal movement. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the operation speed using the menu buttons on the liquid crystal panel. [M1]: High speed <Fast speed> [M2]: Medium speed <Middle speed> [M3]: Low speed <Slow speed> • If you do not specify anything here, the loader will operate at the high speed [M1]: High speed <Fast speed> setting. Press the [Start] button and the loader starts the operation. ① Moves the elevator to the first wafer removal height ② Raises the A-arm to the cassette height

Test No./ Test Name	Function Outline
	③ M→E ④ E→M ⑤ M→E standby position ⑥ E standby position →E ⑦ E→E standby position ⑧ E standby position→M The loader then repeats steps ③ to ⑧. • The operation will not start if a cassette is set on the elevator. • Press the [Start] button to pause the operation at the break point. • The speed can be changed during the pause. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the elevator and the A-arm return to their initial positions and the loader stops the operation.
No. 4 A- arm rotation check	<A-arm rotation check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the A-arm rotary movement. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the operation speed using the menu buttons on the liquid crystal panel. [M1]: High speed <Fast speed> [M2]: Medium speed <Middle speed> [M3]: Low speed <Slow speed> • If you do not specify anything here, the loader will operate at the high speed [M1]: High speed <Fast speed> setting. Press the [Start] button and the loader starts the operation. ① Raises the A-arm ② Turns it to the right ③ Turns it to the left The loader then repeats steps ② and ③. • Press the [Start] button to pause the operation at the break point. • The speed can be changed during the pause. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the A-arm returns to its initial position and the loader stops the operation.
No. 5 Macro table vertical movement check	<Macro table vertical movement check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the vertical movement of the Top Macro inspection table. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the operation speed using the menu buttons on the liquid crystal panel. [M1]: High speed <Fast speed> [M2]: Medium speed <Middle speed> [M3]: Low speed <Slow speed> • If you do not specify anything here, the loader will operate at the high speed [M1]: High speed<Fast speed> setting. Press the [Start] button and the loader starts the operation. ① Raises the macro table ② Lowers the center table The loader then repeats steps ① and ②. • Press the [Start] button to pause the operation at the break point. • The speed can be changed during the pause. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the macro table returns to its initial position and the loader stops the operation.
No. 6	<L-arm vertical movement check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for**

Test No./ Test Name	Function Outline
L-arm vertical movement check	**longer than one minute before restarting the operation.** This program can be used to check the L-arm vertical movement. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the operation speed using the menu buttons on the liquid crystal panel. [M1]: High speed <Fast speed> [M2]: Medium speed <Middle speed> [M3]: Low speed <Slow speed> • If you do not specify anything here, the loader will operate at the high speed [M1]: High speed <Fast speed> setting. Press the [Start] button and the loader starts the operation. ① Raises the L-arm (Lower limit → Middle point) ② Raises the L-arm (Middle point → Upper limit) ③ Lowers the L-arm (Upper limit → Middle point) ④ Lowers the L-arm (Middle point → Lower limit) The loader then repeats steps ② to ④. • Press the [Start] button to pause the operation at the break point. • The speed can be changed during the pause. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the L-arm returns to its initial position and the loader stops the operation.
No. 7 L-arm	<L-arm rotation check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.**

Test No./ Test Name	Function Outline
rotation check	This program can be used to check the L-arm rotation. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the operation speed using the menu buttons on the liquid crystal panel. [M1]: High speed <Fast speed> [M2]: Medium speed <Middle speed> [M3]: Low speed <Slow speed> • If you do not specify anything here, the loader will operate at the high speed [M1]: High speed <Fast speed> setting. Press the [Start] button and the loader starts the operation. ① Raises the L-arm ② Rotates the L-arm to registered position 1 ③ Rotates the L-arm when the rotation button is pressed • Press the button for registering the tilt position [Memory 1] or [Memory 2], and the L-arm rotates and stops at the registered position. • By pressing and holding down the button [Memory 1] or [Memory 2] for registering the tilt position, you can register the position where the L-arm is presently located. By pressing the [M4]: <Return L-arm to registered tilt angle position>, you can make the L-arm return to the initially registered tilt position. • The speed can be changed during the pause. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the L-arm returns to its initial position and the loader stops the operation. To save the registered position, press the button [Memory 1] or [Memory 2] for registering the tilt position.

No. 8 Vacuum	<Vacuum switch check> This program can be used to turn each vacuum electromagnetic valve ON/OFF and check the ON/OFF

Test No./ Test Name	Function Outline
switch check	state of the corresponding vacuum switch. Press the [Start] button. If the loader has not been initialized, initialization starts. ① Select the electromagnetic valve to turn ON/OFF by using the Wafer No. selector buttons. The arm height is changed each time the menu button on the liquid crystal panel is pressed. Select a menu button ([M1] or [M2]) and press the [Start] button to being operation. [M1]: Change the up/down position of the A-arm <A-arm change position> [M2]: Change the L-arm position <L-arm change position> • Showing the vacuum switch ON/OFF state <Switch display> The ON/OFF state of the vacuum switch that corresponds to the selected electromagnetic valve is indicated on the Wafer No. selector button. When the vacuum switch is ON, the LED on the Wafer No. selector button lights up. [No. 1]: A-arm #1 <A1> [No. 2]: A-arm #2 <A2> [No. 3]: Center table <M> [No. 4]: Stage <S> [No. 5]: L-arm <L> Turning the electromagnetic valve ON/OFF <Valve switching> When the selected electromagnetic valve is ON, the LED on the Wafer No. selector button lights up. [No. 11]: A-arm #1 <A1> [No. 12]: A-arm #2 <A2> [No. 13]: Center table <M> [No. 14]: Stage <S> [No. 15]: L-arm <L> Turning the vacuum switch buzzer ON/OFF <buzzer switching> The buzzer keeps sounding as long as the LED on the Wafer No. selector button is lit and the vacuum switch is ON. [No. 21]: A-arm #1 <A1> [No. 22]: A-arm #2 <A2> [No. 23]: Center table <M> [No. 24]: Stage <S> [No. 25]: L-arm <L> • When the [Quit] button is pressed, the arms return to their initial positions and the loader stops the operation.
No. 9 Stage lock check	<Stage lock movement check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the operation of the optional AL120-SLK when it is installed. The stage lock is turned ON/OFF each time the [Start] button is pressed.
No. 10 Centering	<Centering sensor count check> This program can be used to check the centering sensor count state.

Test No./ Test Name	Function Outline
sensor count check	Press the [Start] button. ① Initialized1 ② Lowers the elevator ③ Raises the A-arm and turns the horizontal drive motor OFF ④ Set a wafer on the A-arm so that it is in virtually the same position as during transfer. ⑤ Press the [M1] button <Vacuum valve change> to hold the wafer. ⑥ Press the [Start] button, and the A-arm moves horizontally and the value detected by the centering sensor is displayed on the liquid crystal panel. The following four items are displayed: S1:#1 Displacement of the detected position toward the front of the sensor [um], displacement of the detected position toward the back of the sensor [um] S2:#2 Displacement of the detected position toward the front of the sensor [um], displacement of the detected position toward the back of the sensor [um] S3:#3 Displacement of the detected position toward the front of the sensor [um], displacement of the detected position toward the back of the sensor [um] S4:#4 Displacement of the detected position toward the front of the sensor [um], displacement of the detected position toward the back of the sensor [um] #3 and #4 are displayed only on the AL120-6, not displayed on other models. The centering sensor detection state is indicated by the LED ON/OFF state of the Wafer No. selector button. #1 centering sensor detection ON:OFF #2 centering sensor detection ON:OFF #3 centering sensor detection ON:OFF #4 centering sensor detection ON:OFF • The operation will not start when a cassette is set on the elevator. • Press the 4-way button [RIGHT] to start initialization in the horizontal direction of the A-arm. • When an error occurs, the loader displays the same error code as in the regular operation, and then stops. • Press the [Quit] button, and the elevator and the A-arm return to their initial positions and the loader stops the operation. Vacuum turns OFF automatically.

Test No./ Test Name	Function Outline
No. 11 Elevator height adjustment	<Elevator height check> This program can be used to check and adjust the elevator height. Press the [Start] button. If the loader has not been initialized, initialization starts. Select the item to adjust by using the menu buttons on the liquid crystal panel. [M1]: Adjust the wafer removal height <Height setting> [M2]: Adjust the A-arm and elevator height reference value <A-E position search> [M1]: Adjust the wafer removal height <Height setting> Using the 4-way button, select the number of the wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. ① Insert the wafer to set into the cassette slot. (Initially, insert the wafer into the 12th, 13th or 14th slot from the bottom.) ② Put the cassette on the elevator. ③ Using the Wafer No. selector button, specify the slot to which the wafer for adjustment was inserted. (Initially, specify 13.) ④ Press the [Start] button. ⑤ The elevator moves down and stops at the specified removal height. ⑥ The A-arm moves up and the horizontal excitation turns OFF. ⑦ Manually insert the A-arm into the cassette. You can select an operation from the menu buttons on the liquid crystal panel to then confirm or adjust the settings. [M1]: Turn the vacuum ON for the A-arm <Vacuum ON OFF> [M2]: Alternate between the elevator height, removal height, and arm insertion height <Put a wafer on a A-arm> [M3]: Register <Save> [M4]: Specify a different slot <Change slot> [Pause]: Replace the A1-arm with the A2-arm or vice versa. ⑧ Confirm the arm insertion height or make fine adjustments. Elevator movement can be selected by using the 4-way button on the liquid crystal panel. [UP]: Raise the elevator slightly <UP: Elevator 0.1 mm UP> [DOWN]: Lower the elevator slightly <DOWN: Elevator 0.1 mm DOWN> ⑨ Register the adjusted value. [M3]: Register <Save> ⑩ Confirm the wafer removal height or make fine adjustments. Switch the elevator operation by using the menu buttons on the liquid crystal panel. Press the [M1] button to turn on the vacuum for the A-arm <Vacuum> Press the [M2] <Put a wafer on A-arm> to move the elevator to the wafer removal height. The elevator movement can be selected by using the 4-way button on the liquid crystal panel. [UP]: Raise the elevator slightly <UP: Elevator 0.1 mm UP> [DOWN]: Lower the elevator slightly <DOWN: Elevator 0.1 mm DOWN> ⑪ Register the adjusted value. [M3]: Register <Save> ⑫ When a wafer is chucked by the vacuum, press the [M1] button to turn the vacuum OFF for the A-arm. ⑬ Press the [M2] button <Put a wafer on A-arm> to raise the elevator to the A-arm insertion height. • When the [Quit] button is pressed, wafer removal height adjustments are finished and each part is initialized. • When the [M4] button is pressed, and you are brought back to ③ and can specify a different slot.

Test No./ Test Name	Function Outline
	For the 2nd and 25th wafer, confirm by performing the steps ③ through ⑧, and ⑩ and ⑫. • Whether a wafer is outside its detection range of the wafer out sensor can be confirmed by viewing the LED inside the[Option] button If detected, the LED lights up.
	[M2]: Adjust the A-arm and elevator height reference value <A-E position search> Using the 4-way button, select the number of wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. You can select a specific operation from the menu buttons on the liquid crystal panel to then confirm or adjust the settings. [M1]: Move to the start position <Move start position> [M2]: Wafer detection operation <A-E position search> [M3]: Move to the detection position <A moves to the height of the wafer> [M4]: Register <Save> ① Insert a wafer with the standard thickness into the first slot of a cassette. ② Put the cassette on the elevator. ③ Press the [M2] button, and the elevator moves down and stops at the specified removal height. [M1]: Move to the start position <Move start position> ④ The A-arm moves up and the horizontal excitation turns OFF. ⑤ Manually insert the A-arm into the cassette. ⑥ Finely adjust the arm insertion height using the 4-way buttons. 4-way button [UP]: Raise the elevator slightly <UP: Elevator 0.1 mm UP> 4-way button [DOWN]: Lower the elevator slightly <DOWN: Elevator 0.1 mm DOWN> ⑦ Press the [M2] button. [M2]: Wafer detection operation <A-E position search> ⑧ Vacuum turns ON for the A-arm. ⑨ The elevator moves down and stops at a position where a wafer is chucked by a vacuum. The elevator then moves up. ⑩ Manually remove the A-arm from the cassette. ⑪ Press the [M3] button to move the elevator down to the position where a wafer is chucked by the vacuum. [M3]: Move to the detection position <A moves to the height of the wafer> ⑫ Register the adjusted value. * Check the clearance between the wafer and the A-arm. [M4]: Register <Save> ⑬ Press the [Quit] button, and the elevator and the A-arm return to their initial positions as in step ①. • Pres the [Quit] button to terminate the arm and elevator height reference value adjustment.

Test No./ Test Name	Function Outline
No. 12 Wafer mapping adjustment	<Mapping parameter check> This program can be used to adjust the mapping sensor. Press the [Start] button, and select the item to adjust by using the menu buttons on the liquid crystal panel. [M1]: Automatically adjust mapping parameters <Mapping auto adjust> [M2]: Execute mapping and display results <Mapping result display> [M3]: Manually input mapping parameters <Input parameter> [M4]: Check the mapping sensor <Mapping sensor check>
	[M1]: Automatically adjust mapping parameters <Mapping auto adjust> The mapping parameters can be adjusted automatically. Using the 4-way button, select the number of the wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. ① Insert the wafers to be set into the lowest and highest slots of a cassette. ② Press the [M1] button. The elevator moves down to the lower limit, and then moves up and stops at the upper limit. If the loader displays that the mapping data is <Result>: OK, press the [M2] button to register the data. [M1]: Execute the automatic mapping adjustment <Adjust mapping> [M2]: Register the results of automatic mapping adjustment <Save>
	[M2]: Execute mapping and display results <Mapping result display> This program can be used to check for normal detection when mapping is executed based on the registered data. [M1]: Execute mapping <Mapping> [M2]: Display results of mapping sensor 1 (center) <Display result sensor1> [M3]: Display results of mapping sensor 2 (far side) <Display result sensor2> AL120-L/LMB86-180, LMB8-90 [M4]: Display results of mapping sensor 3 (near side) <Display result sensor3> AL120-L/LMB86-180, LMB8-90
	[M1]: Execute mapping <Mapping> Using the 4-way button, select the number of the wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. ① Insert all wafers to be confirmed into the cassette. ② Press the [M1] button. The elevator moves down to the lower limit, and then moves up and stops at the upper limit. [M2], [M3], [M4]: Display mapping results <Display result> ① Press the [M2], M3] and [M4] buttons to display the results on the liquid crystal panel. The results displayed include the results of judgments for each slot (Pass/Fail), center position of a wafer <P>, and wafer thickness <Thick>. [M1]: Next page <PageUp> [M2]: Previous page <PageDn> [M3]: Terminate display <Exit>

Test No./ Test Name	Function Outline

[M3]: Manual input of mapping parameters <Input parameter>
This program can be used to modify mapping parameters.

Using the 4-way button, select the number of the wafer type to modify from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button.

① Parameter setting items are displayed on the liquid crystal panel.
Select the parameter to change with the 4-way button.

[M1]: Switching between mapping sensors 1, 2, and 3
[M2]: Save <Save>
[M3]: Delete<Back space>
[M4]: Terminate display <Exit>
[No.1 to No.9]: Input numbers 1 to 9. [No.10]: Input 0.
[No.21]: Input -. (To be used only for the offset start position)
4-way buttons [RIGHT] and [LEFT]: Move the cursor.
4-way buttons [UP] and [DOWN]: Move from one item to another.

Settable parameters
Item .....Set value .....Default
• Number of cassette slots
<Slot>.....:25/26 25
• Slot pitch
<Pitch>.....:4.760/6.350 .....150mm=4760/200mm=6350
• Upper limit of wafer position error
<Upper> .....:10 to 3000
• Lower limit of wafer position error
<Lower> .....:10 to 3000
• Upper-limit value of wafer thickness
<Thick Upper>.....:90 to 5000
• Lower-limit value of wafer thickness
<Thick Lower>.....:90 to 400
• Start position
<Start Position>..... .....150mm=38500, 200mm=48500

Default

	S1	S2	S3
AL120-86 Series			
200mm	Upper 800 / Lower 800	Upper 800 / Lower 800	Upper 800 / Lower 800
200mm	Upper 800 / Lower 800	Upper 800 / Lower 800	Upper 800 / Lower 800
400um-180um	Thick Upper 5000 / Thick Lower 180	Thick Upper 4000 / Thick Lower 180	Thick Upper 4000 / Thick Lower 180
180um-90um	Thick Upper 2000 / Thick Lower 90	Thick Upper 5000 / Thick Lower 90	Thick Upper 5000 / Thick Lower 90
150mm	Upper 600 / Lower 600	Upper 600 / Lower 600	Upper 600 / Lower 600
675-400	Thick Upper 4000 / Thick Lower 400	Thick Upper 4000 / Thick Lower 400	Thick Upper 4000 / Thick Lower 400
150mm	Upper 600 / Lower 600	Upper 600 / Lower 600	Upper 600 / Lower 600
400um-150um	Thick Upper 4000 / Thick Lower 150	Thick Upper 4000 / Thick Lower 150	Thick Upper 4000 / Thick Lower 150
AL120-6 Series			
675um-400um	Upper 550 / Lower 550 Thick Upper 4000 / Thick Lower 400		
	Upper 550 / Lower 550		

② Select an item using the 4-way buttons and input a value using the wafer No. buttons.
③ To register the modified values, press [M2]: Save <Save>.
To terminate the program without modification, press [M4]: Terminate display <Exit>.

Test No./ Test Name	Function Outline
	[M4]: Check the mapping sensor <Mapping sensor check> You can confirm ON or OFF of the mapping sensor. Press the [M4] button to move the elevator down. • ON or OFF of the mapping sensor <Switch display> When the mapping sensor is performing the detection operation, the LED inside the [Wafer No.] button is on. [No.1]: Mapping sensor 1 (center) [No.2]: Mapping sensor 2 (back) [No.3]: Mapping sensor 3 (front) Switch between ON and OFF of the buzzer <buzzer switching> The buzzer continues sounding while the LED in the [Wafer No.] button is on and the sensor is ON. [No.21]: Mapping sensor 1 (center) [No.22]: Mapping sensor 2 (back) [No.23]: Mapping sensor 3 (front)
No. 13 A-arm origin sensor check	<Origin sensor check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the origin sensor of each axis of the A-arm. Press the [Start] button, and select the items to adjust by using the menu buttons on the liquid crystal panel. [M1]: A-arm horizontal direction <A Linear> [M2]: A-arm vertical direction <A Up Down> [M3]: A-arm rotation direction <A rotation> [M4]: Elevator<Elevator origin> Press the [Start] button, and the sensor and motor origin signal ON/OFF states are indicated by the LEDs on the Wafer No. selector buttons. ON state: LED on the Wafer No. selector button lights up. Motor excitation turns OFF. [M1]: A-arm horizontal direction <A Linear> Select the position to check from the submenu. [M1]: Origin position <Origin> [M2]: Move to the retracted position in front of cassette (Standby position) <Standby> [M3]: Cassette position <Elevator> ---------- • [M1]: Origin position <Origin> ① The sensor detection state can be checked by moving the A-arm horizontally. 4-way button [Right]: Move toward the elevator by one pulse 4-way button [LEFT]: Move toward the center table by one pulse [M1]: Initialize [M2]: Switch between moving toward the elevator by 7 mm and moving toward the stage by 7 mm [M3]: Turn excitation OFF The sensor and motor origin signal states are indicated by the LEDs on the Wafer No. selector buttons. [No. 1]: Origin sensor detection ON:OFF [No. 2]: Motor driver origin ON:OFF Press the [Quit] button, and the loader is initialized and stops the operation.

Test No./ Test Name	Function Outline
	• [M2]: Moves to the retracted position in front of cassette (Standby position) <Standby> ① The A-arm moves vertically up to the cassette height. ② The A-arm moves horizontally to the retracted position before cassette. • [M3]: Cassette position <Elevator> ① The A-arm moves vertically up to the cassette height. ② The A-arm moves horizontally to the cassette position. 4-way button [RIGHT]: Move toward the elevator by one pulse 4-way button [LEFT]: Move toward the center table by one pulse [M1]: Move toward the elevator by 5 mm / Move toward the stage by 5 mm [M2]: Turn excitation OFF • The state of the sensor is displayed where the wafer No. is shown. [No. 1]: Origin sensor detection ON:OFF • If a cassette is set on the elevator, operation does not start. Press the [Quit] button, and the loader is initialized and stops the operation.
	[M2]: A-arm vertical direction<A UP/DOWN> Select the position to check from the submenu. [M1]:Origin position<Origin> [M2]: Cassette height position <Cassette position> [M3]: Stage height position <Stage position> The sensor and motor origin signal states are indicated by the LEDs on the Wafer No. selector buttons. [No. 1]: Origin sensor detection ON:OFF [No. 2]: Motor driver origin ON:OFF Press the [Quit] button, and the loader is initialized and stops the operation. ---------- • [M1]: Origin position <Origin> ①The sensor detection state can be checked by moving the A-arm vertically. [M1]: Initialize [M2]: Move up by 3.5 mm [M3]: Move down by 1.5 mm [M4]: Switch between excitation ON and OFF 4-way button [UP]: Move upward by one pulse 4-way button [DOWN]: Move downward by one pulse • [M2]: Cassette insertion height position <Cassette> ①The sensor detection state can be checked by moving the A-arm vertically. [M1]: Alternately move to the cassette insertion height and a position 0.5 mm lower 4-way button [UP]: Move upward by 55 um 4-way button [DOWN]: Move downward by 55 um [No.1]: Cassette height sensor detection ON:OFF • [M3]: Stage height position <Stage position> ① The sensor detection state can be checked by moving the A-arm vertically. 4-way button [UP]: Move upward by one pulse 4-way button [DOWN]: Move downward by one pulse [No.1]: Cassette height sensor detection ON:OFF

Test No./ Test Name	Function Outline
	[M3]: A-arm rotation direction <A rotation> Select the position to check, from the submenu. [M1]: Origin position <A Rotation origin> [M2]: Adjust the A1 sensor position <A1 Sensor> [M3]: Adjust the A2 sensor position <A2 Sensor> ---------- • [M1]: Origin position <A Rotation origin> ① The A-arm moves vertically up to the stage transfer height. 4-way button [Right]: Move clockwise by one pulse 4-way button [LEFT]: Move counterclockwise by one pulse [M1]: Initialize [M2]: Switch between excitation ON and OFF. The sensor and motor origin signal states are indicated by the LEDs on the Wafer No. selector buttons. [No. 1]: Origin sensor detection ON:OFF [No. 2]: Motor driver origin ON:OFF [No. 3]: A1 sensor ON:OFF [No. 4]: A2 sensor ON:OFF Press the [Quit] button, and the loader is initialized and stops the operation. • [M2]: Adjust the A1 sensor position <A1 Sensor> ① The A-arm moves vertically up to the stage transfer height. ② Press [M2] button. When the A1 signal is OFF, replace A1 with A2. 4-way button [Right]: Move clockwise by one pulse 4-way button [LEFT]: Move counterclockwise by one pulse [M1]: Initialize [M2]: Alternately move 85 pulses CW and 85 pulses CCW [M3]: Turn excitation OFF Press the [Quit] button, and the loader is initialized and stops the operation. • [M3]: Adjust the A2 sensor position <A2 Sensor> ① The A-arm moves vertically up to the stage transfer height. ② Press [M2] button. When the A2 signal is OFF, replace A1 with A2. 4-way button [Right]: Move clockwise by one pulse 4-way button [LEFT]: Move counterclockwise by one pulse [M1]: Initialize [M2]: Alternately move 85 pulses CW and 85 pulses CCW [M3]: Turn excitation OFF Press the [Quit] button, and the loader is initialized and stops the operation.

Test No./ Test Name	Function Outline
	[M4]: Elevator<Elevator origin> 4-way button [UP]: Move upward by one pulse 4-way button [DOWN]: Move downward by one pulse [M1]: Initialize [M2]: Alternately move to the initialization position and a position 0.5 mm lower [M3]: Turn excitation OFF The sensor and motor origin signal states are indicated by the LEDs on the Wafer No. selector buttons. [No. 1]: Origin sensor detection ON:OFF [No. 2]: Motor driver origin ON:OFF Press the [Quit] button, and the loader is initialized and stops the operation.
No. 14 Centering transfer position check	<Centering adjustment> This program can be used to check and adjust the centering position for each wafer diameter. Press the [Start] button. ① Insert the wafers into any slot of a cassette. ② Using the 4-way button, select the number of wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. (Registration is done for each wafer diameter. Registration for each wafer thickness is not available.) ③ Mapping is performed and the [Wafer No.] button for a slot in which there is a wafer blinks. Press the [Wafer No.] button to specify the slot into which the wafer to be adjusted has been inserted. The [Wafer No.] button for the selected slot stops blinking and stays lit. ④ Press the [Start] button. ⑤ The selected wafer is loaded from the cassette. After centering is performed, the wafer continues spinning on the center table. Note: For the AL120-86, wafer decentering can be checked by looking at the voltages of the orientation flat sensors at 90-degree intervals that are displayed on the liquid crystal panel. For the AL120-6, the voltages of the orientation flat sensors are not displayed. ⑥ Using the 4-way button, correct the centering position. The correction value can be set in 0.04 mm intervals. Stop the center table rotation before making corrections. [Start]: Pause the rotation 4-way button [UP] : Far side <Far> 4-way button [DOWN] : Near side <Near> 4-way button [LEFT] : Left <LEFT> 4-way button [RIGHT] : Right <RIGHT> ⑦ Register the correction value. [M1]: Register <Save> The registered correction data is saved in the internal memory. After the data is put in the internal memory, the orientation flat is adjusted, the wafer is loaded into the cassette, and you are brought back to the step ⑤. • Display and registration are effective when the center table rotation is stopped. • When the [Quit] button is pressed, the orientation flat is adjusted and the wafer is loaded into the cassette. The orientation flat must be at the 45-degree position toward the front. • If you do not press [M1] button but press the [Quit] button instead, the wafer is unloaded into the cassette without saving the data.

Test No./ Test Name	Function Outline
No. 15 Orientation flat and notch positions check	<Orientation flat alignment adjustment> This program can be used to check and adjust the orientation flat and notch positions for each wafer diameter. ① Insert a wafer into any slot of a cassette. ② Using the 4-way button, select the number of wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. (Registration is done for each wafer diameter. Registration for each wafer thickness is not available.) ③ Mapping is performed and the [Wafer No.] button for a slot in which there is a wafer blinks. Press the [Wafer No.] button to specify the slot into which the wafer to be adjusted has been inserted. The [Wafer No.] button for the selected slot stops blinking and stays lit. ④ Press the [Start] button. ⑤ The selected wafer is loaded from the cassette. ⑥ Adjust the orientation flat and notch positions. Data saved in the internal memory is displayed on the liquid crystal panel. <CW/CCW 00> In the case of the AL120-6, data saved for each wafer size is displayed. 150 Data: <CW/CCW 00> 125 Data: <CW/CCW 00> 100 Data: <CW/CCW 00> ⑦ Correct the orientation flat and notch alignment position. Save the correction data in the internal memory. Use the 4-way button to correct the position. 4-way button [RIGHT]: Clockwise 4-way button [LEFT]: Counterclockwise One pulse: About 0.1 degree ⑧ Register the correction value. [M1]: Register <Save> ⑨ Press the [Start] button to repeat steps ⑥ to ⑧. • If you do not press [M1] button but press the [Quit] button instead, the wafer is unloaded into the cassette without saving the data. • Use the [Wafer alignment] control for adjusting the orientation flat positions.
No. 16 L-arm rotation origin sensor position check	<L-arm rotation origin sensor check>⚠ **Do not continue the operation for longer than 5 minutes. Wait for longer than one minute before restarting the operation.** This program can be used to check the back-side arm rotation origin sensor. Confirm that there is nothing interfering with the arm. Press the [Start] button. ① The sensor detection state can be checked by the step-operation of the L-arm rotation motor. • Specify the motor operation using the menu buttons on the operation panel display and the 4-way button. 4-way button [UP]: Rotate forward by 30 degrees <Forward 30>

Test No./ Test Name	Function Outline
	4-way button [DOWN] : Rotate backward by 30 degrees <Backward 30> [M1]: Initialize the L-arm <L rotation initialize> [M2]: Switch between excitation ON and OFF <Current ON/OFF> [M3]: Rotate by 90 degrees <Forward 90> • The sensor state is indicated by the Wafer No. selector button. The LED on the Wafer No. selector button lights up on the detection of the sensor. [No. 1]: Origin sensor detection • Press the [Quit] button, and the L-arm returns to its initial position and the loader stops the operation.
No. 17 Stage transfer position adjustment	<Position adjustment to the stage> This program can be used to check the position for transferring wafers onto the stage. Press the [Start] button. Using the 4-way button, select the number of wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. The wafer transfer method can be corrected and adjusted by using the menu buttons on the liquid crystal panel. [M1]: Change the A-arm <A-arm change> [M2]: Transfer a wafer onto the stage <wafer Load> [M3]: Register the correction value <Save> Correction direction 4-way button [UP] : Far side <Far> 4-way button [DOWN] : Near side <Near> 4-way button [LEFT] : Left <LEFT> 4-way button [RIGHT] : Right <RIGHT> ① Press the [M2] button and then the [Start] button to start the process of transferring a wafer to the stage. Before transferring a wafer to the stage, set the orientation flat on the left side. ② Rotate the wafer on the stage by using the stage table rotation knob, and check the shift direction. ③ Input the correction direction by using the 4-way button. ④ Press the [M3] button to register the correction value. The registered correction data is saved in the internal memory, and the wafer is unloaded into the cassette. ⑤ Press the [M2] button and then the [Start] button to start the process of unloading the wafer into the cassette. ⑥ Repeat steps ① and ② to check the decentering amount. ⑦ Press the [Quit] button to unload the wafer into the cassette. ⑧ Press the [M1] button and then the [Start] button to replace one A-arm with the other A-arm. ⑨ Perform steps ① to ⑦. • Press the [Quit] button to terminate the adjustment.

Test No./ Test Name	Function Outline
No. 18 Wafer unloading position adjustment	<Retracted position adjustment> This program can be used to adjust the position where wafers are unloaded into the cassette to the near side (cassette opening side). This prevents unloaded wafers from hitting against the inside of the cassette. [M1]: Load or unload <Load-Unload> [M2]: Register <Save> ① Insert wafers into any slot of a cassette, and set the cassette. ② Using the 4-way button, select the number of the wafer type to adjust from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. ③ Press the [M1] button to unload wafers into the cassette, starting from the lowest slot. The unloading position correction amount is displayed on the liquid crystal panel. ④ The wafer is unloaded into the cassette. ⑤ If <Result>: OK is displayed, press the [M2] button to put the correction data into the internal memory. ⑥ Press the [M1] button to repeat steps ③ and ④. • Press the [Quit] button to terminate the adjustment. • Before starting the test, insert wafers into the cassette and push them in until they stop. (If wafers are already inserted in the cassette, push them in until they stop.) Position the cassette toward the front as much as possible by taking care that it is inside the range of the cassette guide clearance. • Correctable range: 0.5 to 5 mm • An error is displayed when the correction value is negative. No adjustment is needed, as there is no possibility that unloaded wafers will hit against the inside of the cassette. • This adjustment cannot be done when there is a contact type centering.
No. 19 Centering adjustment (wafer unloading)	<Centering adjustment wafer unloading> You can confirm or adjust the centering position for wafer unloading. Press the [Start] button. You can confirm or adjust the sensor operation setting by manipulating the menu buttons on the liquid crystal panel. [M1]: Sensor setting <Sensor setting> [M2]: Check the sensor movement <Move check> ---------- [M1]: Sensor operation setting <Sensor setting> The centering positions for 8- and 6-inch wafers can be registered using the menu buttons on the liquid crystal panel. [M1]: Switch between 8- and 6-inch wafers [M2]: Register the position -3 mm from the center [M3]: Register the center position [M4]: Register the position +3 mm from the center ① Put the centering jig on the macro table in a way that the hole at the center of the centering jig is

Test No./ Test Name	Function Outline
	aligned with the hole at the center of the macro table. ② Press the [M3] button to register the center position. ③ Put the centering jig on the macro table in a way that the hole at the center of the centering jig is set at a position -3 mm from the hole at the center of the macro table. ④ Press the [M2] button to register the -3 mm position. ⑤ Put the centering jig on the macro table in a way that the hole at the center of the centering jig is set at a position +3 mm from the hole at the center of the macro table. ⑥ Press the [M4] button to register the +3 mm position. [M2]:Check the sensor movement <Move check> With the centering position established for an 8- or 6-inch wafer, whether or not proper centering movement is performed can be checked by manipulating the menu buttons on the liquid crystal panel. Using the 4-way button, select the number of wafer type to adjust or register from the list of wafer type numbers displayed on the liquid crystal panel, and then press the [Start] button. [M1]: Switch between macro vacuum ON and OFF <Vacuum valve change> [M2]: Centering movement <Centering> [M3]: M rotations <Rotation> • Press the [Quit] button to finish the process of unloading wafers into the cassette.
No. 20 LED lamp check	<LED lamp check> This program can be used to check that the LED lamps light up. Press the [Start] button. • All the LED lamps on the operation panel blink. (The buzzer sounds at the same time.) • The liquid crystal panel backlight blinks. • The stage transfer permission lamp (LED) blinks. • Press the [Quit] button, and the loader returns to its initial state and stops the operation.
No. 21 Button operation check	<Button motion check> This program can be used to check the operation button motions. Press the [Start] button. • Press a button with an LED, and the LED lights up on the pressed button. • Press the All/Sampling button, and all the LEDs light up. • Press the menu buttons [M1] to [M4] on the liquid crystal panel, and [M1] to [M4] appear on the liquid crystal panel. • When the 4-way button on the liquid crystal panel is pressed, [UP], [DOWN], [LEFT] or [RIGHT] corresponding to the button pressed is displayed on the liquid crystal panel. • When the [Orientation flat position] control is manipulated, [Top], [Right], [Bottom] or [Left] corresponding to the set position is displayed on the liquid crystal panel. • When the [Inspection time] control is manipulated, the inspection time corresponding to the set inspection time is displayed on the liquid crystal panel. • When the [Wafer rotation] control is manipulated, [CCW], [Cancel] or [CW] corresponding to the set rotation is displayed on the liquid crystal panel. • Press the [Quit] button, and the loader returns to its initial state and stops the operation.

Test No./ Test Name	Function Outline
No. 22 Sensor check	<Sensor and button input check> This program can be used to check the sensor input states. Press the [Start] button. • The LEDs on the Wafer No. selector buttons light up in accordance with the sensor input states. • The list of sensors is displayed on the liquid crystal panel. • Use the menu buttons [M1], [M2] [M3]and [M4] to switch the sensors to check. • Press the [Quit] button, and the loader returns to its initial state and stops the operation.

	M1	M2	M3	M4
1	L-arm rotation sensor <L rotate> U401	A-arm horizontal M-position sensor <AL macro> U202	A-arm inclination sensor #1 <A1 deg> U303	Contact centering sensor <Cen out>
2	L-arm upper-limit sensor <L up> U402	Macro table upper-limit sensor <M up> U301	A-arm inclination sensor #2 <A2 deg> U304	Contact centering sensor <Cen in>
3	L-arm transfer sensor <L mid> U403	Macro table lower-limit sensor <M low> U302	86 cassette detection sensor <Cst 8/6> U019	Wafer guide sensor <C cen 6>
4	L-arm lower-limit sensor <L low> U404	Cassette detection switch <Cassette> S101	-	Wafer guide sensor <C cen 6>
5	-	-	-	Wafer guide sensor <C cen 5>
6	Elevator upper-limit sensor <E up> U101	-	-	Wafer guide sensor <C cen 5>
7	Elevator lower-limit sensor <E down> U102	L-arm rotation position registration button 1 <L set1>	E step-out sensor #1 <E out2> U103	Wafer guide sensor <C cen 4>
8	Wafer out sensor <Wafer out> U006	L-arm rotation position registration button 2 <L set2>	E step-out sensor #2 <E out1> U104	Wafer guide sensor <C cen 4>
9	A-arm rotation origin sensor <AR origin> U207	Vacuum sensor for A1-arm <VCM A1> U007	A-arm vertical motor driver TSD <AUP TSD>	
10	A-arm rotation direction sensor #1 <AR 1> U208	Vacuum sensor for A2-arm <VCM A2> U008	A-arm vertical motor driver MO <AUP MO>	
11	A-arm rotation direction sensor #2 <AR 2> U209	Vacuum sensor for macro table <VCM M> U009	A-arm horizontal motor driver TSD <AL TSD>	
12	A-arm upper-limit sensor <A up> U204	Vacuum sensor for L-arm <VCM L> U011	A-arm horizontal motor driver MO <AL MO>	
13	A-arm transfer sensor <A mid> U205	Vacuum sensor for stage <VCM S> U010	A-arm rotation motor driver TSD <AR TSD>	
14	A-arm lower-limit sensor <A low> U206	-	A-arm rotation motor driver MO <AR MO>	
15	A-arm horizontal E-position sensor <AL cassette> U201	Vacuum sensor OPTION <VCM OP> U012	Macro table rotation motor driver TSD <M TSD>	
16	A-arm horizontal retracted position sensor <AL mid> U202	Stage detection sensor <Stage> U001	Macro table rotation motor driver MO <M MO>	
17	Remote controller start button <RC start>	Wafer presence sensor <Wafer1> U015	Elevator rotation motor driver TSD <E TSD>	
18	Remote controller end button <RC end>	A-arm insertion height sensor <Wafer2> U016	Elevator rotation motor driver MO <E MO>	
19	Remote controller Macro registration button <RC NG M>	A-arm insertion height sensor <Wafer3> U017	L-arm rotation motor driver TSD <L TSD>	
20	Remote controller Micro registration Button <RC NG S>		L-arm rotation motor driver MO <L MO>	
21	Remote controller OPTION1 <RC OP1>	Orientation flat alignment sensor <OF6>	Centering sensor #1 <Cen1> U002	
22	Remote controller OPTION2 <RC OP2>	Orientation flat alignment sensor <OF5>	Centering sensor #2 <Cen2> U003	
23	L-arm backward rotation button <L SW BK>	Orientation flat alignment sensor <OF4>	Centering sensor #3 <Cen3> U004	
24	L-arm forward rotation button <L SW FOR>		Centering sensor #4 <Cen4> U005	
25	-	-	-	
26	-	-	-	

Test No./ Test Name	Function Outline
No. 23 Loader settings	<Condition setting> This program can be used for detailed loader settings. Press the [Start] button. Setting items are displayed on the liquid crystal panel. Change the settings using the 4-way button. Use the menu buttons on the liquid crystal panel for registration, cancellation, and page feed. [M1]: Register <Save> [M2]: Cancel <Cancel> [M3]: Next page <PageUp> [M4]: Previous page <PageDn> Setting items ..... [Default] Number of rotations for orientation flat alignment <Rotation of orientation flat> ..... 1st rotation [1] / 2nd rotation [2] Orientation flat alignment position <Priority of orientation flat> ..... Detected [Detect] /First [First] Check for presence of the stage during the A-arm vertical movement <Check stage(A-arm up/dn)> ..... ON [ON] / OFF [OFF] Use of multiple types of wafers <Wafer size> ..... Multiple [Multi] / Single [single] Setting of sequence when power is turned on Top Macro <Top macro button> ..... ON [ON] / OFF [OFF] Setting of sequence when power is turned on Back Macro <Back macro button> ..... ON [ON] / OFF [OFF] Setting of sequence when power is turned on 2nd Back Macro <2nd back macro button> ..... ON [ON] / OFF [OFF] Setting of sequence when power is turned on Microscope <Microscope button> ..... ON [ON] / OFF [OFF] Setting of slot with which wafer transfer begins in a cassette <Start slot> ..... Top [Top] / Bottom [Bottom] Numbering of wafers in a cassette <No. on wafers in cassette> ..... From bottom 1 [Bottom] / From top 1 [Top] Registration of wafers unloaded during operation <Register wafer unloading> ..... ON [ON] / OFF [OFF] Return to origin when power is turned on <Initialize> ..... Automatic [Auto] / Standby [Manual] Start activated by the stage sensor <Stage set start> ..... ON [ON] / OFF [OFF] Use of the vacuum stage <Vacuum stage> ..... Used [Used] / Not used [Not used] Contact centering unit <Contact centering unit> ..... Not used [Not used] / Used [Used] Operation from the COM port <COM Port> ..... Disable [Disable] / Enable [Enable] Automatic selection of wafer type <Wafer select> ..... Manual [Manual] / Automatic [Auto] Buzzer at the end of the A-arm down movement <A buzzer when A-arm is down> ..... OFF [OFF]] / ON [ON Source pressure sensor <Main vacuum sensor> ..... Not used [Not used] / Used [Used] • Press the [M1]: Register <Save> button to register settings and terminate the setting operation. Press [M2] button to quit without making corrections: Cancel <Cancel> • In the above described items, items for optional parts are included. Some of the above described items may not be enabled, although they are selected and enabled, depending on the specifications of your loader unit.

Test No./ Test Name	Function Outline
No. 24 Wafer type setting	<Wafer parameter setting> This program can be used to register wafer types, and set and change the size, thickness and transfer speed for each wafer type. Press the [Start] button. The registered wafer types are displayed on the liquid crystal panel. ① Specify the item to modify or add, and press the 4-way button [RIGHT]. • Modify: Move the <×> to the item to modify by using the 4-way button. • Add: Move the <×> to the item to add by using the 4-way button. ② Move to the setting item by using the 4-way button, and change the value by using the up and down buttons. ③ Move to the comment item by using the 4-way button, and changes into the comment input screen in the [M3] button <Edit>. Settable items • Wafer size <Size> :200/150/125/100/--- Normally, the wafer size can be set to any size appropriate for your wafer loading operation. Standard settings: 150 for AL120-6 series, 200 for AL120-8 series • When chose ---, the set point is deleted, and it is not displayed to a wafer type screen at the time of the inspection. • Wafer thickness <Thick> ・Wafer size <Size>150/125/100mm：675-400/400-150 ・Wafer size <Size>200mm：725-400/400-180/180-90 * Wafer size and thickness settings may be unavailable, depending on the loader specifications. • Transfer speed <Speed> :Fast/Middle/Slow/SP1−SP5 SP1 to SP5 can be set to desired speeds for each axis. Optional speed is limited as follows by wafer thickness <Thick>. 725−400.....：Fast/Middle/Slow/SP1～SP5 Normal setting〈Fast〉 400−180.....：Middle/Slow/SP1～SP5 Normal setting 〈Middle〉 180−90.....：Slow/SP1～SP5 Normal setting 〈Slow〉 • Comment <Comment> ----------: A−Z, a−z, 1 to 0, space [M1]：Decision〈OK〉 [M2]：Cancel〈Cancel〉 [M3]：Back space〈BkSpace〉 [M4]：Exchange〈Change〉 Capital letter input..... [No.1～No.26]：Input of A to Z Small letter input..... [No.1～No.26]：Input of a to z Number input..... [No.1～No.9]：Input of 1 to 9, [No.10]：Input of 0, [No.11]：Input of −, [No.12～No.26]：Input of space Capital letter input, small letter input, number input are replaced whenever they push [M4]：Exchange 〈Change〉. Up to 16 characters can be entered. An input is possible even if it uses PC and the specially designed maintenance software. 4-way button [UP], [DOWN]: Change the set value of each item 4-way button [LEFT], [RIGHT]: Change the setting item [M1]: Register <Save> [M2]: Cancel <Cancel> [M3]: Detailed settings When the transfer speed <Speed> is set to SP1 to SP5, press [M3] button <Detail> to open the detailed setting screen. When the Comment <Comment> is [M3] button <Edit> to open the comment input screen.

Test No./ Test Name	Function Outline
	• Transfer speed <Speed> SP1 to SP5 A-arm horizontal speed <A-arm linier speed> ..... High speed <Fast> / Medium speed <Middle> / Low speed <Slow> A-arm rotation speed <A-arm rotation speed>..... High speed <Fast> / Medium speed <Middle> / Low speed <Slow> A-arm vertical speed <A-arm up down speed> ..... High speed <Fast> / Medium speed <Middle> / Low speed <Slow> L-arm horizontal speed <L-arm rotation speed> ..... High speed <Fast> / Medium speed <Middle> / Low speed <Slow> Macro table rotation speed <Macro table rotation speed>..... High speed <Fast> / Medium speed <Middle> / Low speed <Slow> L-arm vertical speed <L-arm up down speed> ..... High speed <Fast> / Medium speed <Middle> / Low speed <Slow> Macro table vertical speed <Macro table up down speed>..... High speed <Fast> / Medium speed <Middle> / Low speed <Slow>
No. 25 Contact Centering open/close movement check	<Contact centering open/close check> The movement can be checked only if the optional AL120-CC is mounted. Open and Close are switched between each time the [Start] button is pressed.
No. 26 Software version and error log display	<Error log Software version> This program can be used to check the software version and the history of error occurrences. The software version or error log displayed can be cleared and the error log date can be set by manipulating the menu buttons on the liquid crystal panel. [M1]: Clear <Clear> [M2]: Set date <Date> [M3]: Go to the previous page <PageUp> [M4]: Go to the next page <PageDn> Move the cursor using the 4-way buttons [UP], [DOWN], [RIGHT] and [LEFT]. ① Press the [Start] button. The software version and error log are displayed on the liquid crystal panel. [M1]: Press the <Clear> button and then the [Start] button to delete the error log Software version <Ver.>: 01.00 Error code display: Error code <Code>: Refer to the Operation Manual for error code details. Sequence in which the error occurred <Seq>: Number of the sequence in which the error occurred Step in which the error occurred <Step>: Number of the step in which the error occurred Date and time of error occurrence <Date><Time> • Press the[Quit] button to quit this program. • Up to ten errors are recorded in the error log. • Data is cleared after the loader has remained off for continuous two weeks. • If the date has been cleared, use [M2]: <Date> to set the date. • To output the error log in text format, use the specially designed maintenance software for use with a PC

Test No./ Test Name	Function Outline
	[M2]: Set date <Date> ① Parameters to be set are displayed on the liquid crystal panel. Select the parameters to be changed using the 4-way buttons. [M2]: Save <Save> [M3]: Delete <Back space> [M4]: Exit the display <Exit> [No.1 to No.9]: Input numbers 1 to 9 4-way buttons [RIGHT] and [LEFT]: Move the cursor. 4-way buttons [UP] and [DOWN]: Move between items. Parameters that can be set: • Year <Year> the last two digits of a calendar year • Month <Month> • Date <Date> • Hour <Hour> • Minute <Minute> • Second <Second> ② Select an item using the 4-way buttons, and input a value using the [Wafer No.] buttons. ③ After the item has been corrected, press [M2]: <Save> to register the corrected item. To quit the program without correcting the item, press [M4]: Exit the display <Exit>.

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4 Replacement of Consumables

Consult your nearest EVIDENT distributor for the inquiry about consumables.

Please give the distributor the product name and serial No.

The tools and accessories required are indicated with Tools and Accessories in this text. Tools are not included with this product.

Replacement cycles are indicated with **Replacement Cycle**.

The standard time required for replacement work is indicated with **Standard Working Time**.

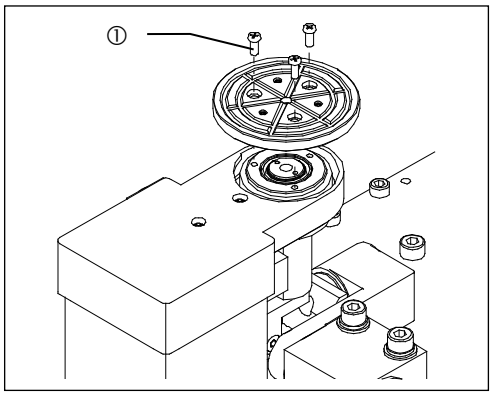
Be sure to turn the main switch OFF and unplug the power cord before replacing consumables.

Use the right tool for the right accessory when assembling this product. If the tools are not used properly or this manual is not followed during assembly, parts may be damaged and product safety cannot be guaranteed.

If any noise occurs in the operation of a part, please contact your EVIDENT distributor.

This loader uses specialized clean grease. Improper greasing may cause a malfunction.

1 Macro (Center) Table: If a vacuum error has occurred or the table has become damaged



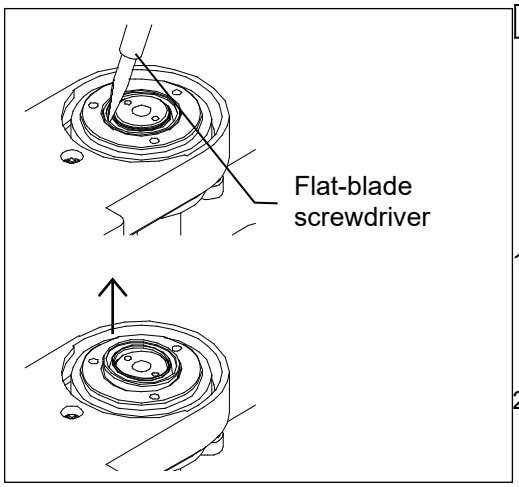
Tools Phillips-head screwdriver (No. 0)

Accessories M2 cross recessed pan head machine screws

1) Remove the three M2 cross recessed pan head machine screws ① and replace the macro (center) table.

Standard Working Time 10 minutes

2 Macro (Center) Table Oil Seal: If a vacuum error has occurred



Tools Phillips-head screwdriver (No. 0)

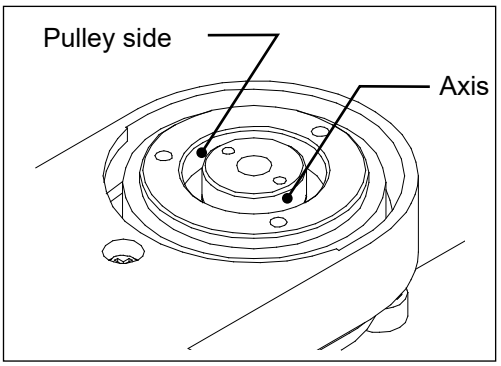
Flat-blade screwdriver (No. 2.6-30)

Special oil seal mounting jig (guide, shaft and collar)

Clean wiper and absolute alcohol

Accessories Oil seal

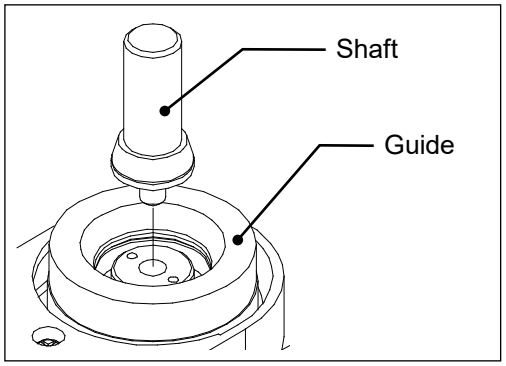
1) Remove the three M2 cross recessed pan head machine screws using the Phillips-head screwdriver, and remove the macro (center) table.
2) Insert the flat-blade screwdriver into the oil seal groove. Remove the oil seal by lifting it from the outside (pulley side).



3) Wind the clean wiper around the flat-blade screwdriver. Moisten it with commercially available absolute alcohol and clean the shaft and the pulley side.

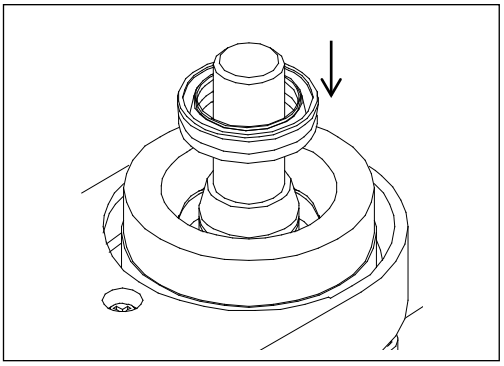
CAUTION

Never put absolute alcohol near flames as it is highly flammable. Take care not to cause a spark by turning on/off electric appliances or fluorescent lamps.

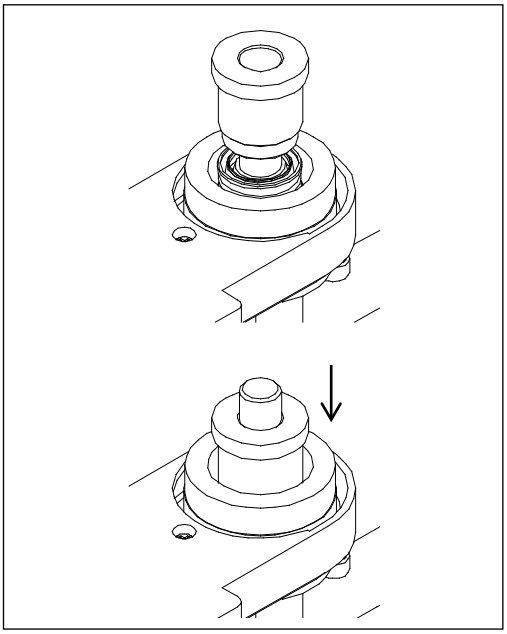


4) Attach the special jig for inserting the oil seal.
Set the guide to the stepped section on the top surface of the pulley.

5) Insert the shaft into the axis hole.

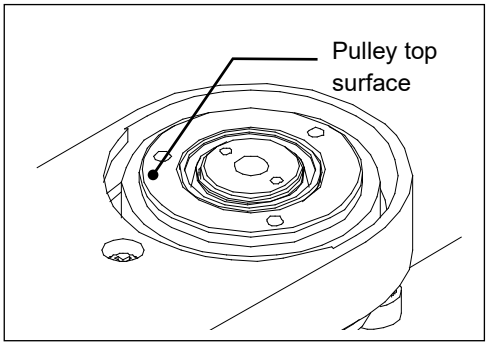


6) Drop a new oil seal into the guide, with the lip facing up.



7) Insert the collar into the shaft axis.

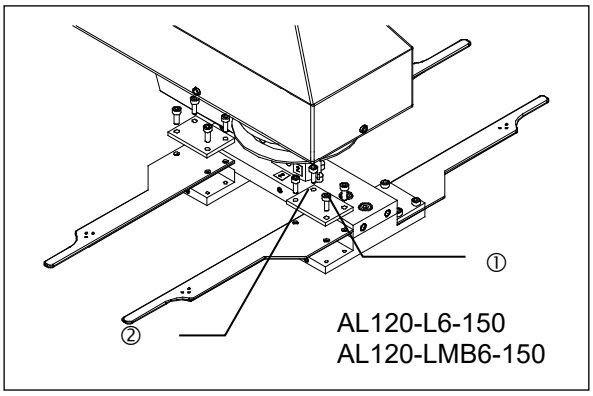
8) Insert the collar into the oil seal groove and push it down.

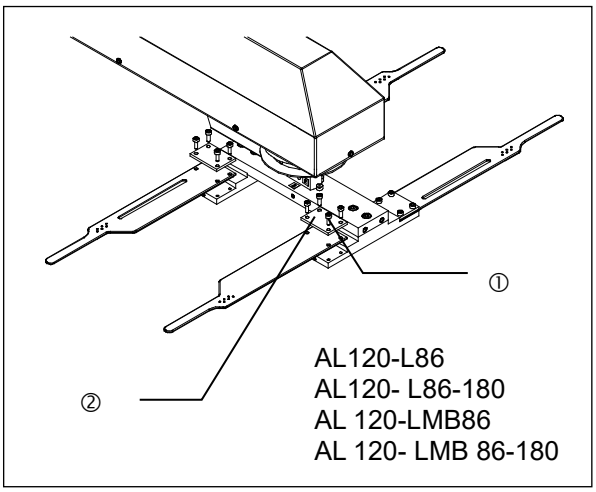


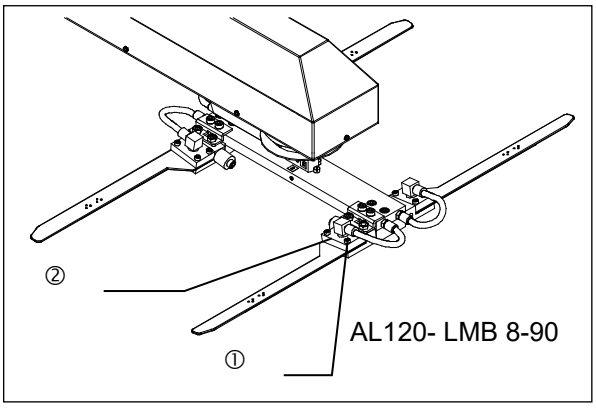
9) Remove the special oil seal mounting jig and check that the oil seal lip does not protrude from the pulley top surface.
10) After the check, attach the macro (center) table.

Replacement Cycle 5 years
Standard Working Time 20 minutes

3 A-arm: If a vacuum error has occurred or the A-arm has become damaged

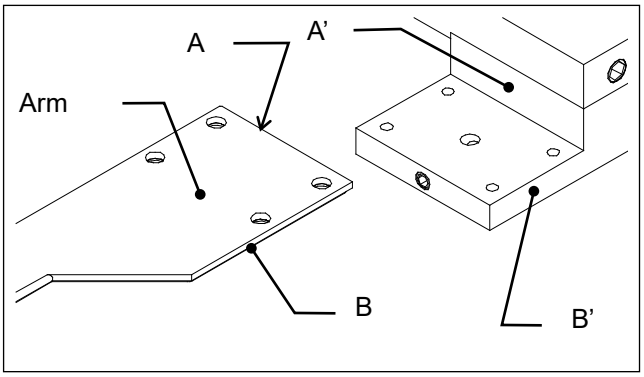






Tools Hexagonal wrench (with an opposite side distance of 2.5 mm)
Accessories M2 hexagon socket head bolts

1) Remove the M2 hexagon socket head bolts (four for each arm).
2) Replace the arm.
Align surface A with surface A' and surface B with surface B' as shown below.

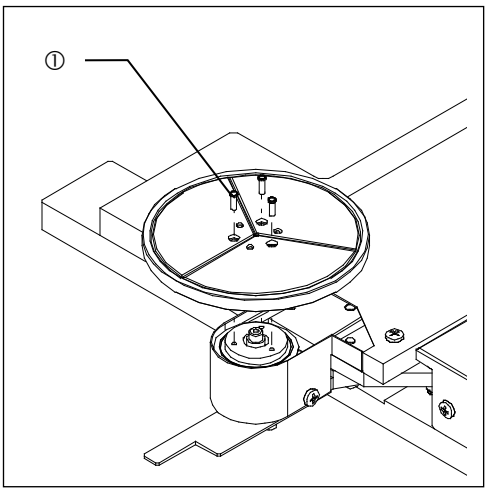


3) Set the hold plate ② and secure it with the M2 hexagon socket head bolt ①.

Standard Working Time 20 minutes

* For the AL120-LMB8-90, replace the arm with the tube connected to the hold plate ②.

4 Vacuum Table: If a vacuum error has occurred or the table has become damaged



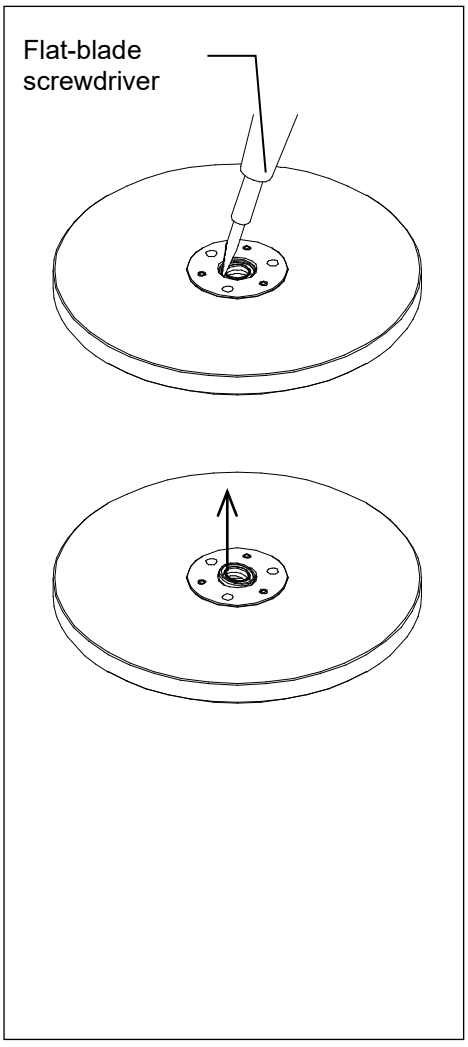
Tools Phillips-head screwdriver (No. 0)

Accessories M2 cross recessed pan head machine screws

1) Remove the three M2 cross recessed pan head machine screws ①, and replace the macro (center) table.

Standard Working Time 10 minutes

5 Oil Seal for Vacuum Table: If a vacuum error has occurred



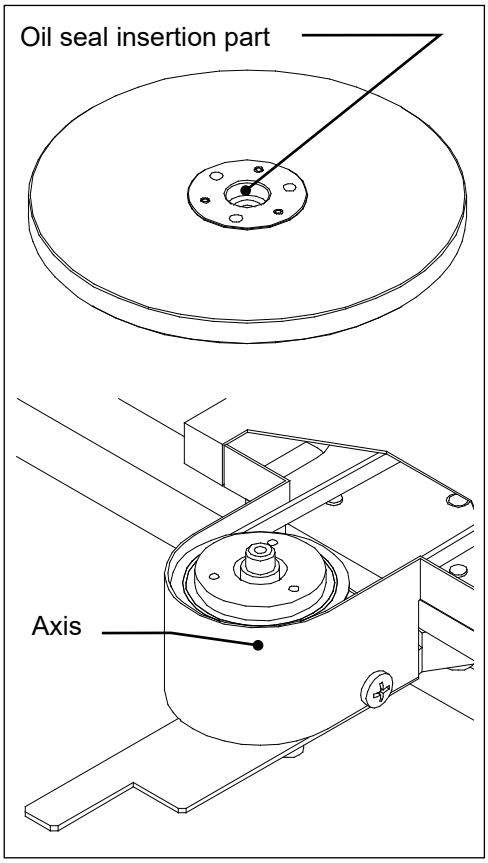
Tools Phillips-head screwdriver (No. 0)

Flat-blade screwdriver (No. 2.6-30)

Clean wiper and absolute alcohol

Accessories Oil seal

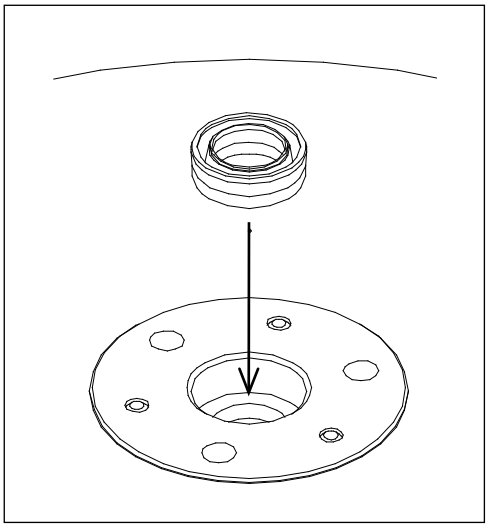
1) Remove the three M2 cross recessed pan head machine screws using the Phillips-head screwdriver, and remove the vacuum table.
2) Lay the vacuum table upside-down on a flat surface.
3) Insert the flat-blade screwdriver into the oil seal groove. Remove the oil seal by lifting it from the outside.



4) Wind the clean wiper around the flat-blade screwdriver. Moisten it with commercially available absolute alcohol and clean the oil seal insertion part of the vacuum table and the axis of the vacuum stage.

CAUTION

Never put absolute alcohol near flames as it is highly flammable. Take care not to cause a spark by turning on/off electric appliances or fluorescent lamps.

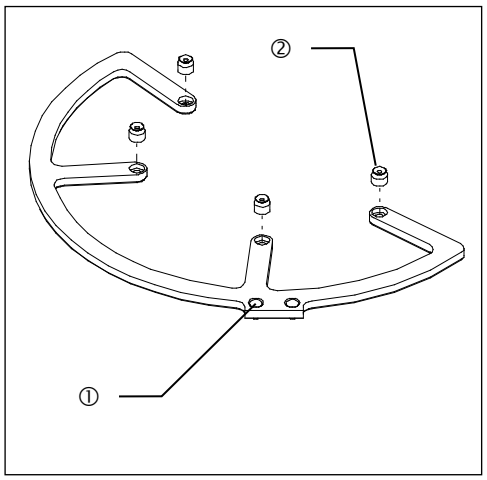


5) With the lip facing up, push the new oil seal fully into the vacuum table insertion part until it stops.
6) Turn the vacuum table over, and attach it to the vacuum stage.

Replacement Cycle 5 years

Standard Working Time 20 minutes

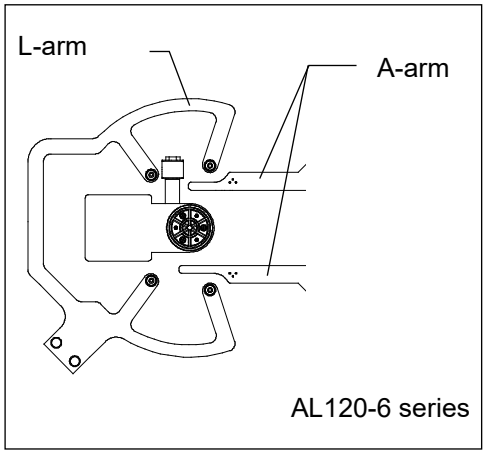
6 L-arm Vacuum Pad



Tools Phillips-head screwdriver (No. 2)

Accessories

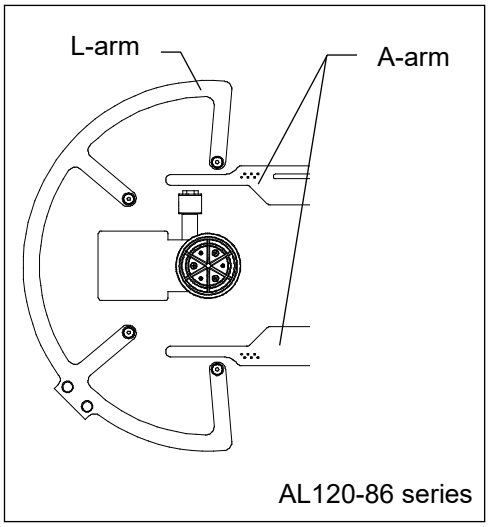
1) Remove the two M3 cross recessed countersunk screws ①, and remove the L-arm from the loader main body.
2) Put the L-arm on a flat surface and replace the vacuum pad ②.



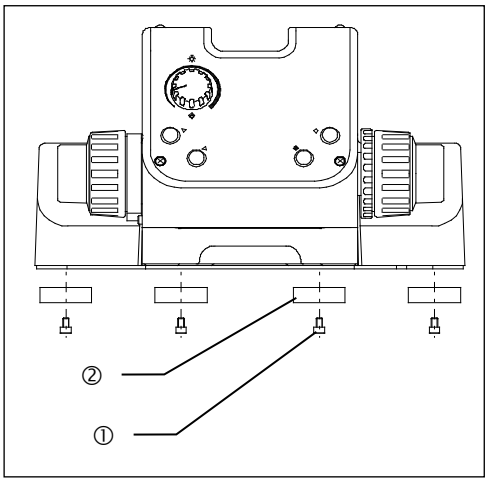
3) After attaching the L-arm to the loader main body, check that the clearance between the L-arm and the A-arm is uniform. If the clearance is not uniform, check that the L-arm is properly attached, and attach it again if necessary.

Replacement Cycle Transfer of 350 thousand wafers

Standard Working Time 20 minutes



7 Rubber Microscope Legs: If wafer transfer sound has increased



1) Remove the stage and replace the rubber blocks on the underside of the microscope.
   Since the wafer transfer position must be checked and other related work must be done, please contact your EVIDENT distributor.

Standard Working Time 60 minutes

Manufactured by

EVIDENT CORPORATION

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