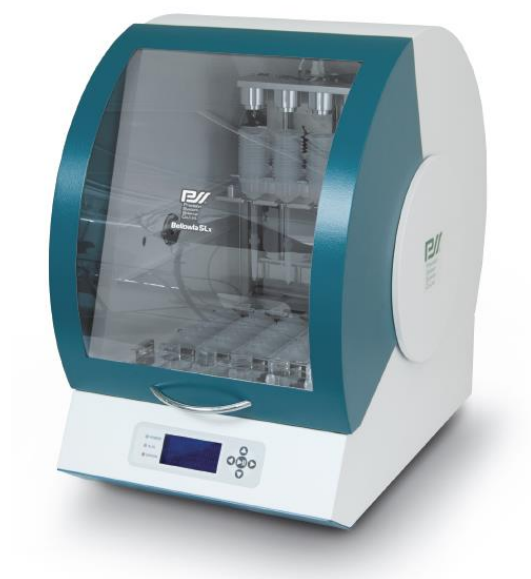


Fully Automated Nucleic Acid Purification System

magLEAD 5bL



User's Manual

Ver. 1.07



Precision System Science Co., Ltd.

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1 Introductions

We appreciate your purchase of *magLEAD 5bL* which utilizes PSS' worldwide patented principle of MAGTRATION® Technology using magnetic particles.

This book is a guide for the user to use the instrument in safe and effectively.

Please read this book thoroughly to understand the instrument before starting operation. Also keep this book nearby the instrument as quick reference for all the operators as needed.

- Do not operate the instrument without sufficiently understanding instructions described in this book.
- Always keep this book nearby for easy reference at any time.

Please inform us, Precision System Science Co., Ltd., when this book is lost or damaged.

Followings are packed together in this Instrument Package.

No	Description	Qty.	Remarks
1	magLEAD 5bL Main Body	1	
2	Combo (Tube) Rack	1	
3	Reagent Cartridge Rack	1	
4	SD Card	1	
5	Fuse	2	
6	AC240V power cable	1	
7	AC110V power cable	1	
8	User's Manual	1	This Book
9	Package Check List	1	

2 For Safety Usage

Most problems are derived from irregular usage of the instrument without following the safety instructions. Please read this manual thoroughly to understand and to get familiar with preventive activities to avoid any problems in instrument operation.

If used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

About Symbols

In this manual, we put symbols for those important items for safety usage of the instrument. The explanation of each symbol is described below.



Warning

- This indicates the possibility that one could be killed or seriously wounded when inadequate operation is done.



Caution

- This indicates the possibility that one could be wounded or physically damaged when inadequate operation is done.

Ref.

- Describe reference information regarding operating procedure or specific issues in this manual, or illustrate details of operation or function. When there exists other information to be referenced, describe the pages or sections.

Note

- Describe information to be emphasized or added for important points. It means that you need to pay close attention in operating instrument.

Examples of symbols



This Symbol with triangle indicates that message of Caution including Danger and Warning. Inside triangle, specific mark is illustrated (the sample on the left shows electric shock.)



This open circled symbol indicates what you shall not do. Details are illustrated inside symbol or nearby the symbol.



● The closed circle symbol is used to restrict operations or to illustrate what to do. Details are illustrated inside the symbol (the sample on the left shows unplugging of AC Plug from wall outlet.)





The following precautionary instructions are included to ensure the safety operation of your *magLEAD 5bL*. Please always keep this book near by the instrument or operator. Failure to comply with the instructions in this manual will void the manufacturer's warranty.

When troubles occurred with the instrument, immediately turn off the main-power switch and unplug power cable. Then make contact with us.






Warning

Installation

- Be sure that no water or liquid would get into the instrument or that the instrument will not get wet. It would cause fire or electric shock.  Ban
- Do not attempt disassembling, modifying or repairing by yourself. It may cause malfunction of instrument or electric shock to you. Ask us for repair or maintenance of the instrument.  Ban

Actions for Emergency

- In an emergency status of instrument, such as extraordinary hot, smoking, abnormal smell, etc., immediately unplug power cable from wall outlet to avoid fire or electric shock to you and contact with us for repair.  Unplug AC power
- When foreign material get inside instrument or water is splashed over inside instrument, immediately unplug power cable from wall outlet to avoid fire or electric shock to you and contact with us.  Unplug AC power
- When power cable is damaged (core wire exposed or broken), immediately unplug power cable from wall outlet to avoid fire or electric shock to you and contact with us.  Unplug AC power



Caution

Installation

- Avoid installing the instrument in following places.
Installing it in inadequate places may cause damage or malfunctions.
- Place exposed to direct sunshine
- Place with vibration, high humidity or dust.
- Place where strong electric or magnetic fields exist.
- Place where liquid or oil could be splashed on.
- Place where flammable gas, corrosive gas or high heat source exist.
- Setting of the instrument shall be made by field service personnel authorized by PSS. Contact us when you transfer the instrument.



Ban



Ban

Storage

- Unplug power cable from wall outlet when the instrument may not be used for extended period of time.



Unplug AC
power

Precautions for Instrument Operation

- Possibility of biohazard from samples or extracted/purified products could not completely be eliminated in operating the instrument. Use a mask, goggles and gloves for your safety when operating the instrument according to the description in this book.
- Pay close attention in handling samples with high risk of biohazard.

- When operating the instrument under low temperature circumstance, keep the instrument powered on.
- Be sure no foreign materials would get into the instrument from outside.
- Do not scratch or press the operation panel using knives or stuff with sharp edges.
- Replacement of the fuse shall be made by field service personnel authorized by PSS. Contact us for fuse replacement.
- After usage of instrument or if any sample or reagent leaked inside the instrument, remove Reagent Cartridge Rack and Combo (Tube) Rack to make a cleanup and sterilization.

About Warranty Period

- 12 months after installation, regardless of its usage.
- This warranty excludes the problems derived from inadequate storage, usage or operation, repair/modification/maintenance of the instrument by anyone who are not authorized by PSS, though within warranty period.

About Abolishment

Contact us when you want to abolish the instrument.

3 Specifications

3.1 Intended Use

magLEAD 5bL instrument, which employs PSS' original technology of MAGTRATION®, using magnetic particles, executes high-performance isolation and purification of nucleic acids (DNA, RNA etc.).

It is intended to be used only in combination with MagDEA Dx LV kits and *magLEAD Tip LV* sets indicated for use with *magLEAD 5bL* instrument for the applications described in the IFU of the kit. The system is intended for use by professional users, such as technicians and physicians trained in molecular biological techniques and the operation of the *magLEAD 5bL*.

3.2 Features

magLEAD 5bL instrument makes the pretreatment of samples, such as genetic screening, the main purposes of use.

This is a cost-effective instrument that utilizes Bellows Tip instead of conventional disposable tip used on the existing dispensing units.

- Full automation of Nucleic Acid extraction/purification from whole blood sample, using Magtration® technology.
- Available for dispensing of up to 20mL with BT-20 Tip.
- Easy operation with dedicated reagent cartridge.
- Compact body that occupies minimal space.
- Accommodates up to 5 samples for concurrent processing.

3.3 Throughput

- Instrument type: Desktop

- Throughput:

Samples	1 – 5 samples/batch
Processing time	About 90 min/1-5 samples
- Temperature Control :

Heat Blocks	Room Temperature-85 deg. C
-------------	----------------------------
- Handling Volume : 1000 - 20000μl
- Dispensing Accuracy :

1000μl	less than CV 10%
20000μl	less than CV 10%

※Accuracy with distilled water at room temperature 20 - 25 deg.C

Note

Processing Time depends on protocols.

3.4 Size, Weight and Power Requirement

- Size : H528 x W440 x D664 mm
*Disregarding prongs.
- Weight : 40kg *Excluding accessories and disposables.
- Power Required : AC100 – 240V±10%, 50/60Hz, 240VA



Caution

-
- Do not share power source with other instruments.
 - Do not place close to instruments giving noises or power fluctuation.
 - Connect power cable to wall outlet with ground line.

3.5 Storage Condition

- Temperature : 5 - 40°C
- Relative Humidity : 15 – 75 % *Non-Condensing
- Barometric Pressure : More than 70kPa(min)

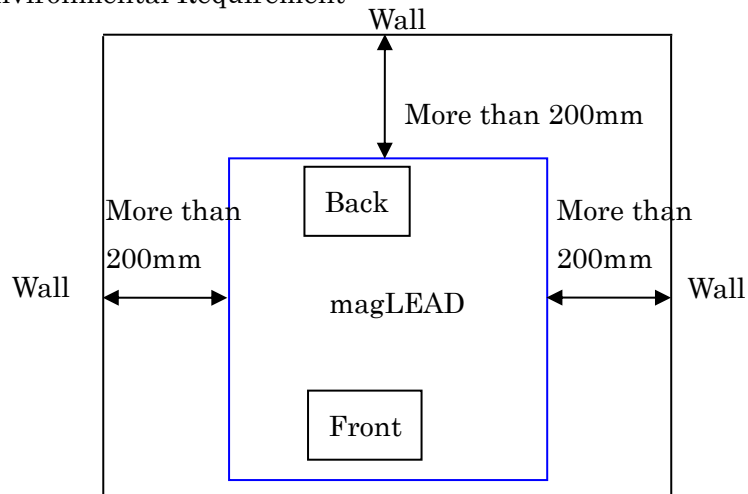
3.6 Transport Condition

- Temperature : -25 – + 60 deg. C
- Relative Humidity : 15 – 75% ※Non-Condensing
- Barometric Pressure : More than 70kPa(min)

3.7 Environmental Requirement

- Overvoltage Category : II
- Pollution Degree : 2
- Installation : Indoor Site Use Only
- Temperature : 15 – 30 deg. C
- Relative Humidity : 15 – 75% ※Non-Condensing
- Altitude : UP to 2,000m
- Space : Keep distances from walls as shown below for ventilation, maintenance work, etc. Also keep more than 200mm space over the instrument.

➤ Environmental Requirement



Caution

- Please set the instrument on horizontal surface that can invariably endure instrument weight.
- Place the instrument on horizontal surface.
- Do not place the instrument where it will get direct sunlight or vibration.
- When operating instrument in a cold chamber or cold room, keep the instrument power on to avoid bedewing.

3.8 About Caution Labels Inside Instrument

3.8.1 Caution Label for High Temperature

Place attached : Heat block





Caution

- The part where this label is attached becomes hot. Be sure not to touch while working.

3.8.2 Caution Label for Biohazard

Place attached : Front of instrument










Caution

- The part where this label is attached (inside cover) has possibility of biohazard contamination with samples or extracted/purified products. Take care not to be contaminated.
- Note that it is not possible to completely eliminate risk of biohazard from samples or extracted/purified products in operating this instrument. Wear a mask, goggles and gloves for your own safety, according to the description in this manual.
- Pay close attention when handling highly hazardous samples.

3.9 About Labels in Rating plate

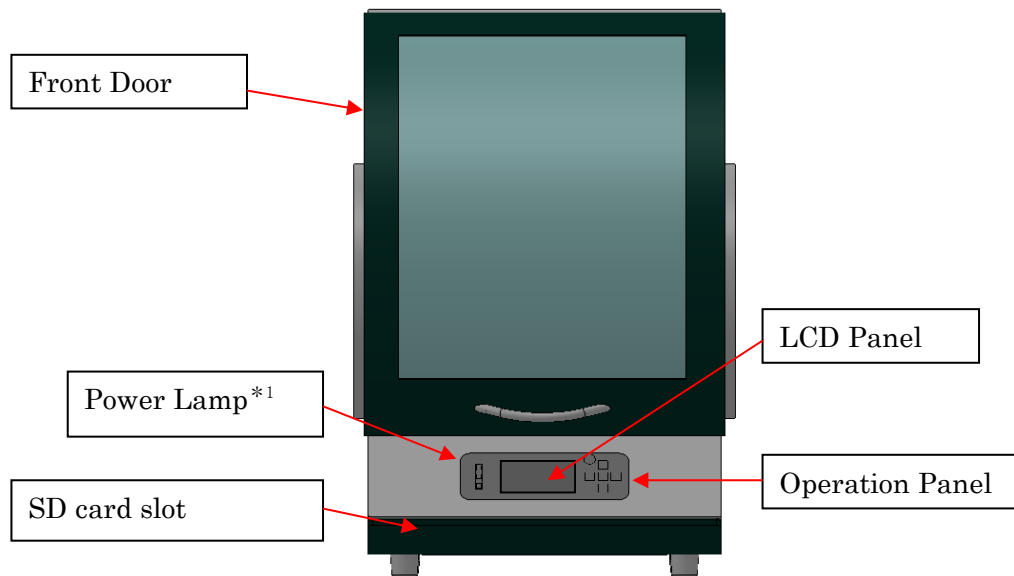
Explanations of labels in rating plate are described in following table.

	<p>CE mark for Europe 98/79/EC (IVD Directive)</p> <p>This instrument has been tested to and complies with standards IEC61010-1 Ed.3 (2010), “Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements;” IEC61010-2-101(2015), “Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2 - 101: Particular requirements for in vitro diagnostic (IVD) medical equipment.” IEC61326-1 (2013), “Electrical equipment for measurement, Control and laboratory use EMC requirements – Part1: General requirements.” IEC61326-2-6 (2013), “Electrical equipment for measurement, Control and laboratory use EMC requirements – Part2-6: Particular requirements in vitro diagnostic (IVD) medical equipment.”</p>
	<p>UL listing mark for Canada and the USA</p> <p>This instrument has been tested to and complies with standards UL 61010 - 1 Ed.3 (2012) and CSA-C22.2 No.61010-1-12 Ed3.(2012), “Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, Part 1: General Requirements.”</p>
	<p>WEEE mark for Europe</p>
	<p>Serial number</p>
	<p>Legal Manufacturer</p>
	<p>Authorized Representative in the European Community</p>

	<p data-bbox="587 268 1197 309">In Vitro Diagnostic medical devices (98/79/EC)</p> <p data-bbox="587 365 1276 499">magLEAD 5bL is not considered as a medical device (IVD) in the United States of America, and it is not registered with the FDA.</p>
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4 System Components

4.1 Front View



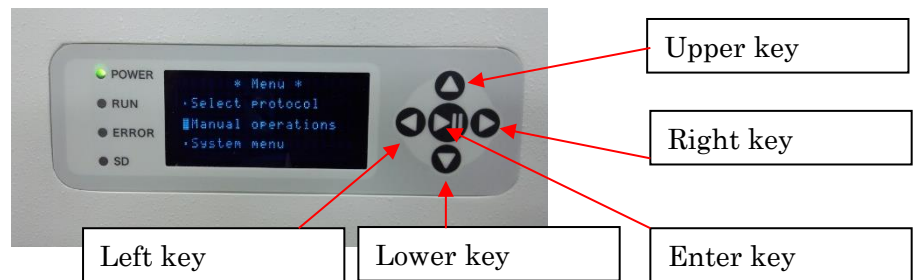
*1:

Light when powered on – green light

Blinks when an error occurred – red light

Working - orange light

4.1.1 Operation Panel



Upper key : Operation of this key will move a cursor upwards.

Left key : Operation of this key will go back to the previous screen.

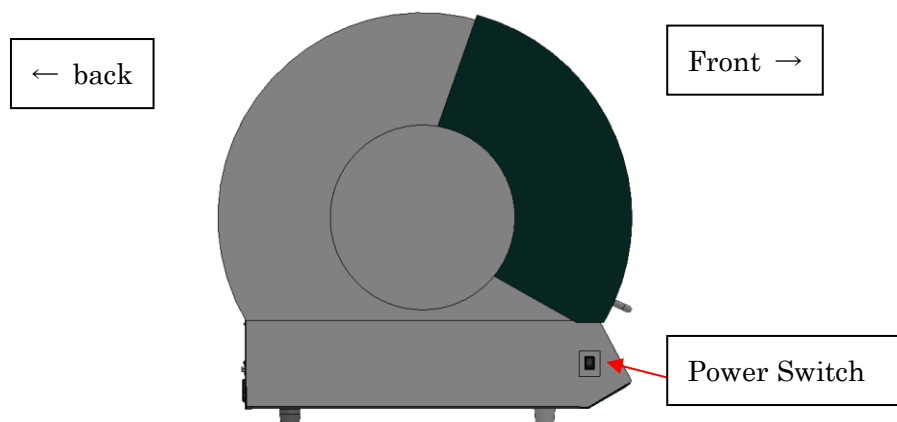
Right key : Operation of this key will move a cursor right.

Lower key: Operation of this key will move a cursor downward

Enter key: Operation of this key will start the protocol or be settled action items.

4.2 Right Side View

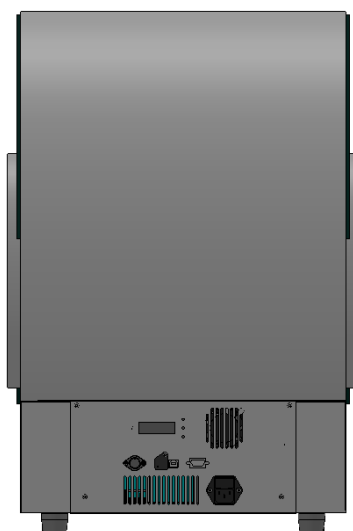
Power switch is located at the left side front of the instrument.



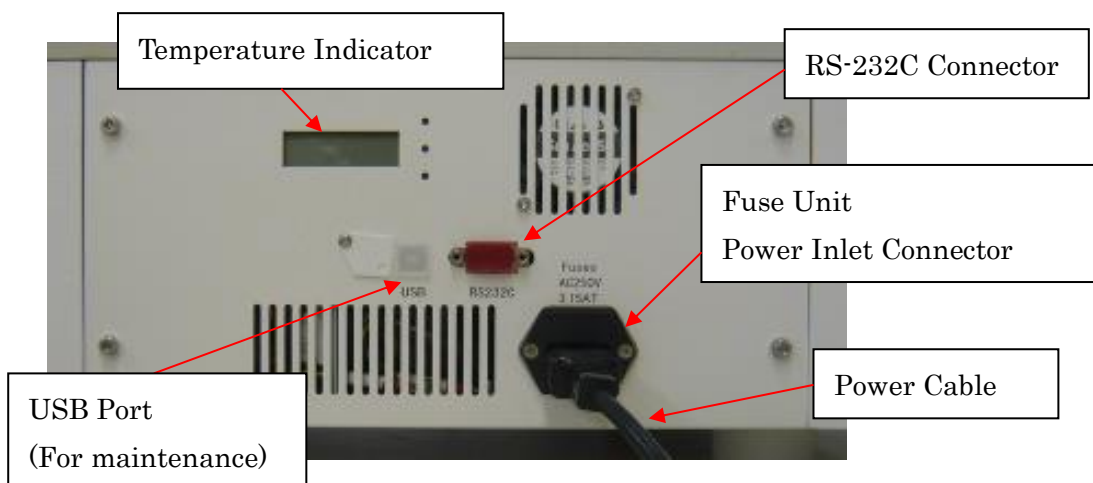
4.3 Back View

Power inlet, USB port, RS-232C port and Temperature Indicator are located on the back side of instrument.

4.3.1 Back View



4.3.2 Back bottom view



Caution

- Do not connect any device other than devices authorized in the operating manual (for options) to RS-232C port.

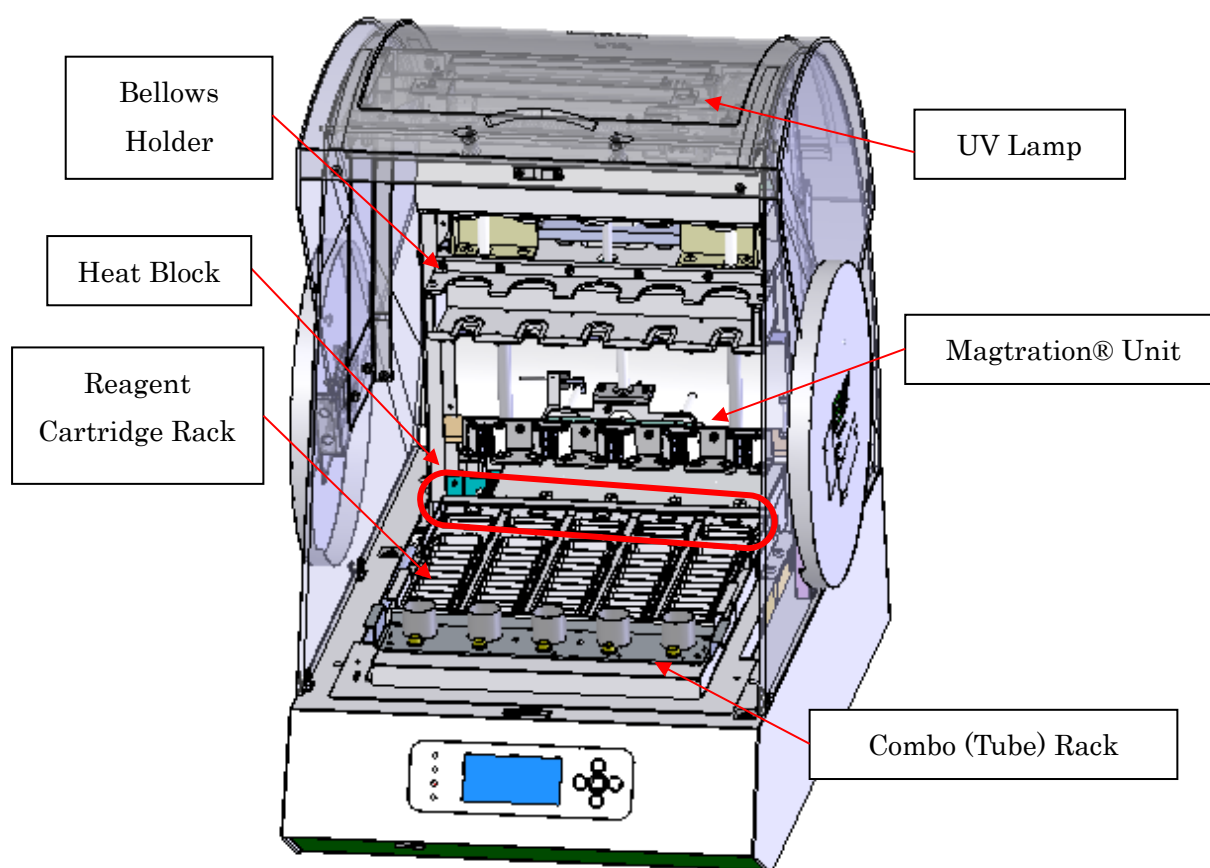
Connecting non-authorized devices could cause malfunctions.

Note

- Replacement of the fuse shall be made by field service personnel authorized by PSS. Contact us for fuse replacement.

4.4 Internal Components

Inside the instrument, Magtration® Unit and Stage Unit are located.



4.4.1 Magtration® Unit

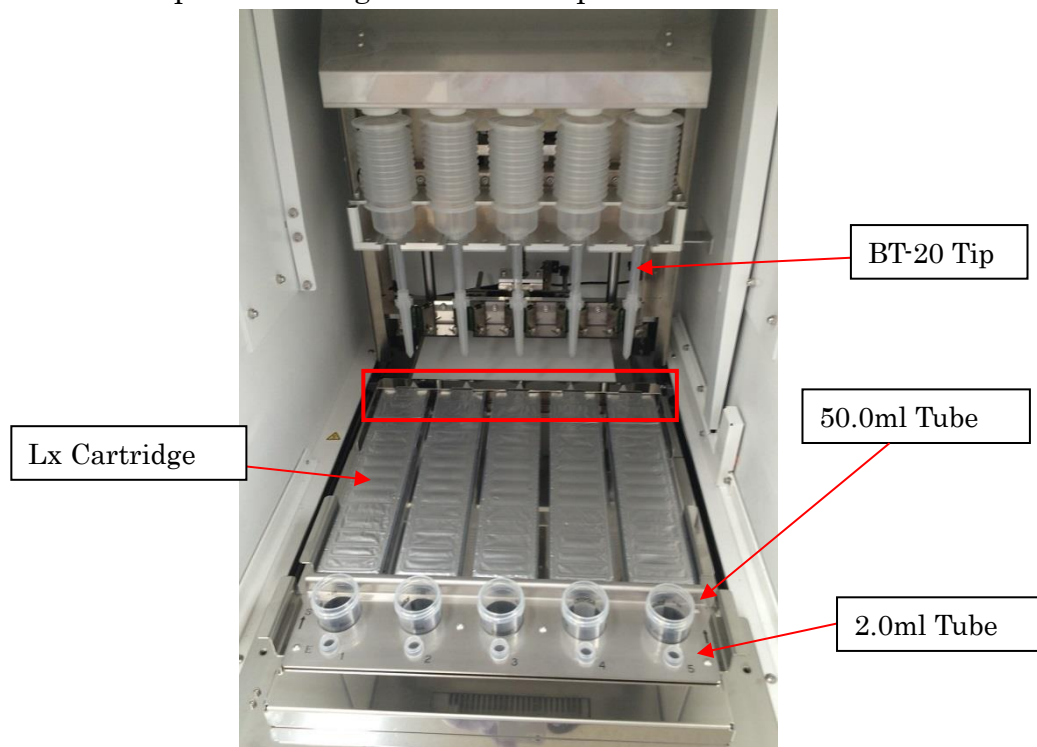
- Bellows Holder
BT-20 tips (up to 5 samples) can be loaded for concurrent aspiration and dispensing.

- Magnet
Five magnets are aligned with 5 tips to simultaneously separate magnetic particles for up to 5 samples.

4.4.2 Stage

- Reagent Cartridge Rack
Cartridge Rack and Reagents Cartridge can be loaded.
- Heat Block(highlighted with red line —)
- Combo (Tube) Rack
Sample and Elution Tubes can be loaded.
- UV Lunn
Sterilizes inside the instrument after Reagent Cartridge Rack is removed.

< Example of loading racks and disposables >



*The above layout is an example and it would be varied by protocols.

5 Installation

5.1 Setup procedure

- ① Take the instrument out of the crate.
*Refer to the unpacking procedures attached to take out.



Warning

- Setting of the instrument shall be made by field service personnel authorized by PSS.
Contact us when you transfer the instrument.
- ② Remove protection films attached on the instrument [and desiccant](#).
- ③ Remove shipping [jigs to fix movable parts](#).
- ④ Remove the cushioning.
- ⑤ Connect Power Cable to Power Inlet Connector on the back of the instrument. Then turn Power Switch on assuring that Front Door is closed securely.



Caution

- Do not use power cable other than provided to avoid troubles such as temporary blackout or fire breaking.
- ⑥ Installation Completed.



Caution

- When transferring the instrument, make sure that all the fixing jigs for all axes are attached securely and that cushioning is set between Magtration Unit and Stage Unit to protect nozzles from free movement.



Warning

- Setting of the instrument shall be made by field service personnel authorized by PSS.
Contact us when you transfer the instrument.

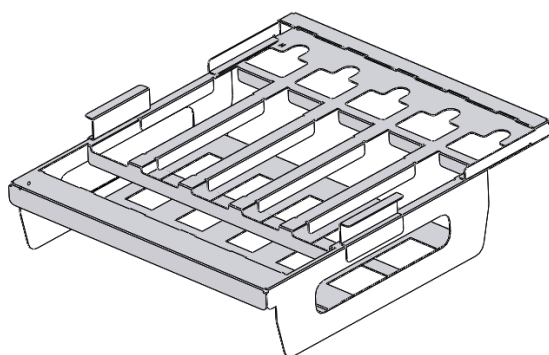
6 Accessories and Disposables

6.1 Accessories

Name of Accessories	Quantity
Reagent Cartridge Rack	1
Combo (Tube) Rack	1
SD Card	1
Fuse	2
AC240V power cable	1
AC110V power cable	1

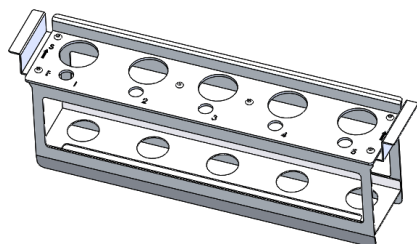
6.1.1 Reagent Cartridge Rack

It holds up to five Lx Cartridges.



6.1.2 Combo (Tube) Rack

It holds up to five Tubes of 50.0ml and 2.0ml.



6.1.3 SD Card

It is used for update of firmware and protocols or storage of barcode input information.

Please insert SD card in SD card slot of the instrument during halt.
(Refer to "4.1 Front View" for the position of SD card slot.)

6.1.4 Handheld Barcode Reader

Handheld Barcode Reader is an Option item. It can read the information of Reagents and Tips.

6.2 Disposables

6.2.1 Disposables Produced by PSS

List of Disposables Produced by PSS

Code	Product Description	Place to be Used
F7230	magLEAD Tip LV set	BT Holder
F1310	MagDEA Dx LV	Reagent Cartridge Rack

- magLEAD Tip LV set (Cat# F7230)



- MagDEA Dx LV (Cat# F1310)



6.2.2 Recommended Disposables Produced by Other Companies

List of the recommended disposables from other companies

Manufacturer	Code	Product Description	Place to be Used
SARSTEDT	72.693	2.0ml Tube with Screwed Cap	Combo (Tube) Rack
Labcon	3181-345-008	Labcon SuperClear 50 mL Conical Tubes	Combo (Tube) Rack

*Disposables needed vary by application and also disposables other than listed above may be recommended in some applications. Refer to Application Manual for details.

6.3 Reagents

Refer to each Application Manual for reagents to be used and directions for use.



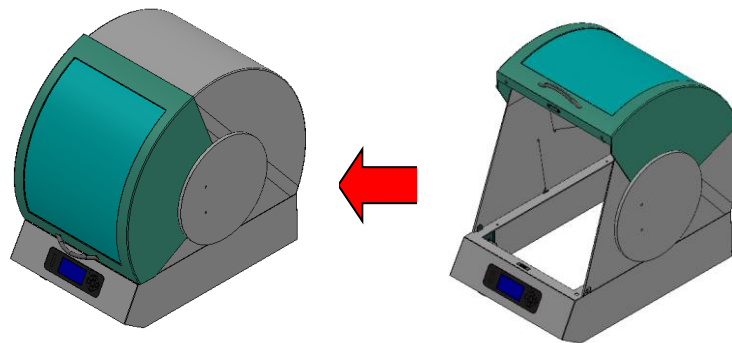
Caution

- Do not reuse any disposables/reagents to avoid contamination or instrument malfunction.
- Do not use disposables/reagents other than specified to avoid instrument malfunction.
- Be sure to wear a mask, goggles and gloves for your own safety when loading or discarding reagents, disposables and samples.
- When discarding disposables, follows the instructions defined by your facility or regional laws.

7 Direction for Use

7.1 Opening and closing of the Front Door

Front Door opens up and closes down. If the door is opened to its uppermost position, it is held there. If Front Door is opened or closed while the instrument is running, the operation is interrupted and it is not possible to resume from where it stopped. If you need to open or close the door while running, stop protocols or working and then open/close the door after the instrument stops completely.

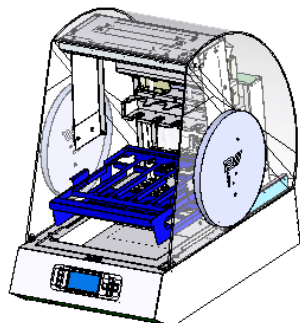


Caution

- If Front Door is not opened to its uppermost position, it may come down and your hand or fingers might be pinched. So make sure to move Front Door to its uppermost position when working.
- Move Front Door gently without giving excessive force to avoid damaging it.

7.2 Putting On and Taking Out Reagent Cartridge Rack

Reagent Cartridge Rack can be taken out for cleanup. Take Reagent Cartridge Rack out of the stage to clean it up and put it back.



Caution

-
- Handle Reagent Cartridge Rack gently without giving excessive force to avoid damaging it.

7.3 Setting Reagent Cartridges and Disposables

7.3.1 Setting Reagent Cartridges on Reagent Cartridge Rack

Orient each Reagent Lx Cartridge with the arrow pointing towards the Reagent Cartridge Rack and slide the Cartridge all the way back along the groove till resistance is felt, as shown in the picture below. Push down the Cartridge till the cartridge is clicked down under the over-hang part of the rack.



7.3.2 Setting Sample Tubes

Set 2.0ml tubes without caps in row.



Caution

- Number of Tube Sets needed depends on protocols. Please refer to the package insert of the reagent for the details.
Be sure to put Tubes before setting them in Combo Rack.

7.3.3 Setting Combo (Tube) Rack

Set combo (tube) rack into the instrument. Flat end of the rack in back side and the other end of the rack in front.



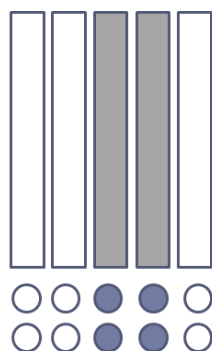
Caution

- Instrument operation without correct placement of Tube or Combo (Tube) Rack may result instrument malfunction.

Note

- If you make purification for small number of samples, using lanes in the middle is recommended.

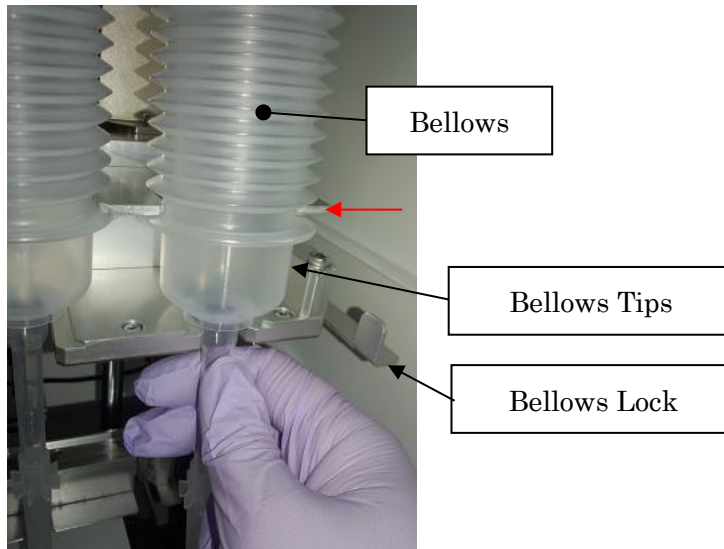
e.g.) Processing 2 samples



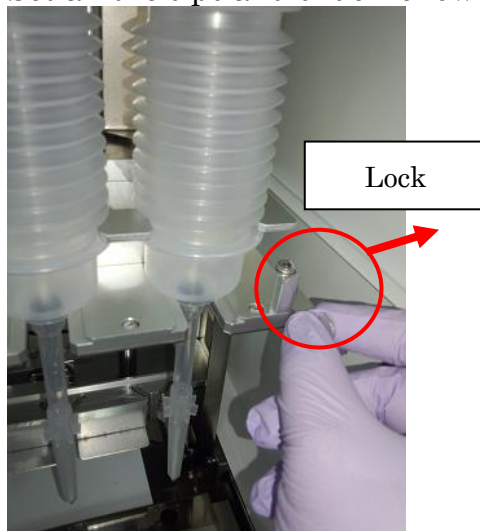
Empty 1 2 Empty

7.3.4 Set of Bellows tips

- ① Slide Bellows Lock to right to unlock.
- ② Set Bellows Tips on the bellows tip holder so that the flange (highlighted by red arrow) is placed under the bellows.



- ③ Set all the tips and slide Bellows Lock to left to lock.



Caution

- Instrument operation without correct placement of Bellows Tip may result instrument malfunction.

7.4 Disposal procedure for reagents and consumables

After a protocol is completed and operation stops completely, a door is opened, and a reagent and consumables are removed.

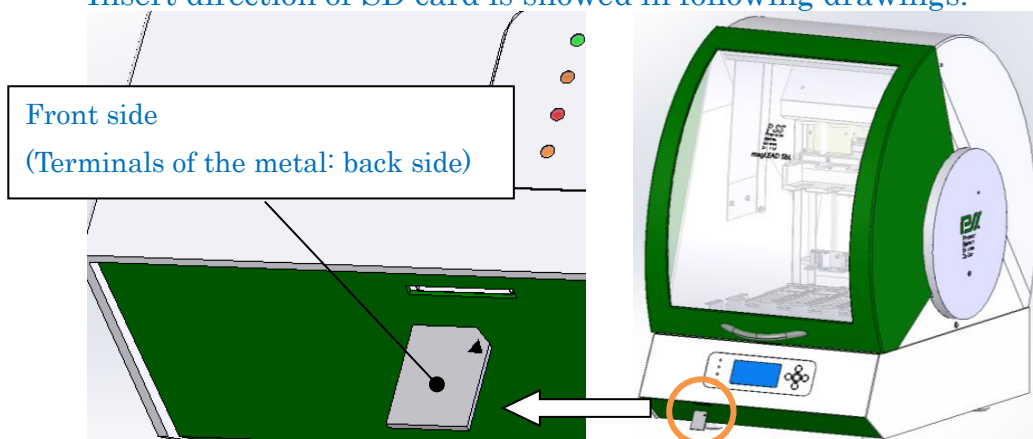


Caution

- Do not reuse any consumables /reagents to avoid contamination or instrument malfunction.
- Be sure to wear a mask, goggles and gloves for your own safety when loading or discarding reagents, consumables and samples.
- When discarding consumables, follows the instructions defined by your facility or regional laws.

7.5 SD card

Insert direction of SD card is showed in following drawings.



Caution

- Incorrect insertion of SD card may cause a breakdown of SD card slot.

8 Basic Operations

8.1 Start Up and Shut Down Procedure

8.1.1 Start Up

- ① Close Front Door.
(Refer to sections “7.1 Front Door Operation.”)
- ② Turn on Power Switch located on the Left side of the instrument.
- ③ The instrument is started up and LCD screen is activated.




8.1.2 Shut Down

- ① Make sure that the instrument is not in operation and turn the power off.

*If it is in operation, press “Protocol Stop” button and make all axes return to ORG position to stop the operation.

8.2 How to run the Protocol program

Please set reagents and consumables in the instrument according to this manual.
(Please refer to "7.3 Setting Reagent Cartridges and Disposables" of this manual.)

- ① Select “·Select protocol” with   key on "Menu" screen and press  key to execute.

* Menu *

·Select protocol

·Manual operations

·System menu

- ② Select using protocol with   key and press  key to execute

For example)

DNA WB 1mL

Ver 1.0.0 2007/06/21

Kit No.E2002-1

PSS



Caution

- Protocols will vary depending on the reagent. Please refer to the Instruction manual to select the respective reagents.
- Malfunction will occur when using the wrong protocol, which could result in failure and negative effect on the extracts.

- ③ Determining the protocol and perform the operation according to the instruction manual of reagents.






Caution


- The method of operation depends on the reagent. Please refer to the instruction manual for the respective reagents.

8.3 Menu for Manual operation

This screen is for the purpose of manual axis movement and maintenance use




- ① Select “•Manual operations” with   key on "Menu" screen and press  key to execute.

Manual operations
•ORG position
•Manual Movement
•UV Decontamination




- ② Push  key, returns to "Menu" screen.

8.3.1 ORG position


Allows axes to return to Home position manually.

- ① Select “•ORG position” with   key on "Manual operations" screen and press  key to execute.

ORG position	
·ORG ALL	
·ORG Z	·ORG P
·ORG Y	·ORG M




- ② Select axis to return Home with   key and press  key to execute.

※Pressing ORG ALL will home all axes in these sequence
M→Z→Y→P




- ③ Push  key, returns to "Menu" screen.


8.3.2 Manual movement

Allows each axis to perform movement manually.



- ① Select “·Manual movement” with   key on "Manual operations" screen and press  key to execute.

Manual movement	
·Y	·P
·Z	·M

- ② Select axis with   key on "Manual movement" screen and press  key to execute.

- ③ Select movement by  key.
·ORG: Return to home position、 ·fine: move slightly、
·coarse: move roughly

Y axis	
Position [0]	
·org	·fine ·coarse
Sensor: ORG	

- ④  key is for up or backward movement,  key is for down or move to the front direction.




*Press and hold the key will cause the movement to go faster in that direction, press and release will result in jog movement.

- ⑤ Push  key, returns to "Menu" screen.






8.3.3 UV Lamp

This screen menu is for the purpose of turning on the UV Lamp

- ① Remove the Combo (Tube) Rack, Reagent Cartridge Rack from the instrument, and then close the front door.

- ② Select "• UV Lamp " with   key on "• Manual operation" screen and press  key to execute.

UV Decontamination
Set time: 1[hour]
•OK
•Cancel

- ③   key is to set the UV exposure time (hourly basis),   for selection of the OK or Cancel and  key to execute. OK to start UV exposure and countdown the time, Cancel to return back to manual operation menu.

*UV Decontamination in process

UV Decontamination
Set time: 8[hour]
Time left: hh:mm
•Cancel

Automatically return to top menu when completed.

* Lighted Lamp remains on when front door is closed and cut off when front door is opened.

- ④ Push  key, returns to "Menu" screen.

8.4 System menu

It is for protocol administration and parameters configuration.

Normally it is not used, utilized only by serviceman or during failure occurs

System menu (1/2)
•Error history
•Diagnostics
•Version info.

System menu (2/2)
•Date/Time Set
•Options
•Protocol Add/Delete





8.4.1 Error history

Record the latest 3 errors and error status of the processed protocol
<Display Contents>




Occurrence date (6 digits), Page executed protocol (P&2 digits),
Error code (E&2 digits), Error Line (L&4 digits)

8.4.2 Diagnostics





- Axis Stroke
Carry out normalization check on home position of each axis, stroke and limit sensor. Used to operate each axis to home, move slowly until it stops at the limit sensor, displayed the stopped position coordinates. Each axis can be moved manually.
- Temperature
The temperature of the heat block can be set as desired, display of current temperature, and confirm the normal operating by an external thermometer
- Key board, I/O
Checking that the Key board is able to input correctly.
I / O port is able to input or output successfully
- Version info.
To check the version of firmware.
- Date/Time Set
To set calendar date and time.

①   key to select Date or Time,  key to execute and  key to return to previous menu.

Date/Time set
•Date
•Time

- ②   key to select the set item,  key to execute.

Date Cur: CMM/CD/CYYY Set: <u>SMM</u> /SD/SYYY	Time Cur: CH:CM:CS Set: <u>SH</u> :SM:SS
--	--

- ③   key to select the set item,  key to execute and  key to return to previous menu.

- Protocol Add/Delete

To add and delete the Protocol. Please update along with the software update documentation

9 Maintenance

Items of maintenance activity are listed below.

Items	Frequency	Operator
Cleaning Stage and Racks	After every run	User
Cleaning Magtration Unit	After every run	User
Maintenance	Once a year	Field Service



Caution

- Possibility of biohazard from samples or extracted/purified products could not completely be eliminated in operating the instrument. Use a mask, goggles and gloves in maintaining the instrument for your safety, according to the description in this book.
- Maintenance work shall be made with instrument power off.
- Pay close attention when cleaning places where caution labels are attached.

Note

- Maintenance work shall be done as indicated, otherwise the results of extraction/purification runs may not be assured.
- Contact us for maintenance work that shall be done by Field Service personnel.
- Magtration Unit, Reagent Cartridge Ruck, Combo (Tube) Ruck and Bellows Holder shall be cleaned after every run.

9.1 Cleaning Procedure

Places to be cleaned:

- Stage
- Magtration Unit
- All Racks

Beside above, all accessories and inside instruments.

Cleaning Method:

Choose liquid depending on the pollution status and wipe the polluted place using paper, such as Kim Wipe®, moistened with the liquid. Use a mask, goggles and gloves when cleaning the instrument for your safety.

- Water
- 70% Ethanol

Note

Do not use alcohol when cleaning LCD Panel or Clear Panel of Front Door. Use water for those parts.

70% Ethanol is an inflammable. When you use Ethanol 70%, please check close that there is no fire.

10 Troubleshooting

10.1 Error Reported During Protocol Run

Error during process
Page:XX Code:YYYY
Line No.=ZZZZ
Press [LEFT] key

Error code reported is shown in place of “YYYY” in the above screen.

(Refer to section “11. List of Error Codes” for error codes.)

- ① If an error occurs during protocol run, the above message will appear on the screen and the instrument stops automatically.
- ② An error code will appear on the screen and refer to the error code list attached to take an appropriate action according to the list. If you make an inquiry for an error, the error code is also necessary. Write down the code somewhere.







Caution

-
- The protocol run aborted by an error cannot be restarted from the point of abortion.

Note

- Repeat the same countermeasure when the same error occurred in the next run of the protocol. Make contact with us when countermeasure taken does not resolve the problem

10.2 Suspending or Aborting Protocol Run

- ① Press  key during protocol run and the protocol is suspended half way.
- ② Select “Start (resume)” or “Break (abort)” with   key and press  key to execute. If “Break” is selected, the instrument

will return to Top Menu with each axis staying where it is and if “Start”, the rest of the protocol run will be executed from where it stopped.

*If a protocol is aborted by “Break”, a new set of Tip Sheath needs to be taken up.



Caution

- If Front Door is opened or closed during “Pause” and any axis is moved manually, click “Break” to return to Top Menu and set necessary disposables on the stage again. If resumed to a protocol run with any axis moved manually, that may result in malfunction or error.
- If a run is aborted by “Break”, it cannot be restarted from where it stopped. Set new disposables and run the protocol all over again.

10.3 Frequently Reported Problems

Problem	Presumable Cause	Countermeasures
Power is not supplied to instrument	AC Power Cable is not connected properly.	Check for connection of AC Power Cable. Be sure to use Power Cable supplied with instrument. ※Do not use power cable other than supplied one.
	Fuse is burned out.	Contact us when fuse needs to be replaced.
Error code is displayed	Causes vary by error code.	Record displayed error code and take appropriate countermeasure, referring to List of Error Codes. If the problem is not solved by any countermeasures, contact us for assistance.
Protocol was started with incomplete setting of Tips or other disposables.	--	<p>Be sure to confirm appropriate setting of reagents and disposables, before starting protocol run.</p> <p>If you want to add disposables after protocol is started, press “STOP” to abort instrument operation.</p> <p>It is strongly recommended to restart the protocol run from the beginning after completion of adding disposables.</p> <p>If you want to continue the protocol run from halted point after adding disposables, you shall be responsible for the result.</p> <p>* When Front Door is opened after halting operation, power to the motors are shut by safeguard, resulting displacement of stopping positions of motors.</p>
Liquid leakage from Tip-end or big difference in liquid level among lanes.	A hole on Bellows tip	If any excessive load is given to Bellows Tip when setting a tip, it could be damaged and liquid might not be aspirated sufficiently. Replace a tip with leak with new one and start the extraction process all over again.
	Disposables are not set properly.	<p>Check for proper setting of Disposables, Cartridge, etc.</p> <p>Note that using disposables other than recommended may cause instrument malfunction.</p> <p>It is strongly recommended to use those disposables designated for the protocol.</p>

11 List of Error Codes

Code No	Explanation of error	Countermeasure to be taken
10	Fail to return to the origin, other than protocol run case.	First, check the position of Tips, cartridges and all accessories. Next, make each axis to return home position.
11	Error occurs by end limit, other than protocol run case.	
12	While in run, fail to return to the origin of Z axis.	
13	While in run, fail to return to the origin of P axis	
14	While in run, fail to return to the origin of M axis.	
15	While in run, fail to return to the origin of Z axis.	
16	While in run, Z axis end limit error occurs.	
17	While in run, P axis end limit error occurs.	
18	While in run, M axis end limit error occurs.	
19	While in run, Y axis end limit error occurs.	
20	While in run, Z axis timeout error occurs.	Take note of displayed error code and contact PSS for further technical support.
21	While in run, P axis timeout error occurs.	
22	While in run, M axis timeout error occurs.	
23	While in run, Y axis timeout error occurs.	
24	Door open error occurs while moving any axis.	Close Slide Door and follow the operation in sections. Take note of displayed error code

		and contact PSS for further technical support.
25	Not pass SelfDiagnostics	Take note of displayed error code and contact PSS for further technical support.
26	Initialization error of temperature controller	
27	N/A	
28	N/A	
29	N/A	
30	While in Pause, Break is selected	Nothing
31	Misstep detection error in Y axis	Take note of displayed error code and contact PSS for further technical support.
	N/A	
110	System error (Cutout values are assigned equal or more than 10)	These errors are related to system software or protocols. Take note of the error code and contact PSS for further technical support.
111	Overflow of script buffer	
112	Overflow of script buffer pointer	
113	Overflow of variable storage buffer	
114	Overflow of variable storage buffer pointer	
115	Overflow of label storage buffer	
116	Overflow of label storage buffer pointer	
117	No end code in script file	
118	Overflow of function storage buffer	
119	Overflow of function storage buffer pointer	
120	Overflow of read-in characters in one row	
121	Overflow of command characters in one row	
122	Overflow of variable characters	
123	Overflow of label characters	
124	Overflow of function characters	
	N/A	

130	Incorrect command name	<p>These errors are related to system software or protocols.</p> <p>Take note of the error code and contact PSS for further technical support.</p>
	N/A	
140	No data for one row	
141	No data at the assigned cut out position	
142	No data although there is assigned cut out position	
143	Inconsistence of the assigned separation character	
144	Too long character string	
	N/A	
150	Incorrect parentheses	
151	Incorrect large parentheses	
	N/A	
160	Inconsistence with variable table	
	N/A	
170	The assigned variable is already registered in variable table	
171	Incorrect variable name to be registered	
	N/A	
180	Data other than number	
181	Set value for system variable is out of range	
182	Out of range data for Z-M collision prevention was set	
	N/A	
190	Neither variable not constant	
191	Inconsistent type between variable and constant	
192	Too much digit of conversion	
193	There is a character unable to convert in variable to be converted.	
	N/A	

200	Incorrect " "	<p>These errors are related to system software or protocols.</p> <p>Take note of the error code and contact PSS for further technical support.</p>
	N/A	
210	Duplicated labels	
211	Incorrect label name to be registered	
	N/A	
220	No VP table number assigned	
221	Duplicated VP table numbers	
	N/A	
232	Smaller data than the first data was read in in VP table	
233	Too many VP table data	
234	Number of character of header data in one row to be read overflows (20 characters)	
	NA	
240	Assigned function has already been registered in function table	
241	Incorrect function name	
	NA	
250	Incorrect argument name	
251	Too many definition of argument	
252	Number of argument does not match between caller and called side	
	NA	
260	Position command is not assigned.	
	NA	
302	Fail to aspirate in a protocol	
	NA	
304	Fail to set temperature in a protocol	
305	Fail to read temperature in a protocol	
306	Fail to execute Key in command	
	NA	
308	Failure of variable addition in a protocol	

309	Failure of variable subtraction in a protocol	<p>These errors are related to system software or protocols.</p> <p>Take note of the error code and contact PSS for further technical support.</p>
310	Failure of jump address search in a protocol	
311	Incorrect wait time set in a protocol	
312	Layer of function call exceeds limit	
313	Failure of InputStr in a protocol.	
	NA	
320	Door Lock/Unlock timeout	
321	Overflow of SelfDiag Log area	
322	Inconsistent checksum of ReadReagbarCode	
323	Expired ReadReagBarCode reagent	
324	SD card Access error	

Note

- Most of the causes of errors listed above are originated by inadequate setting of disposables/accessories or by opened door.
- When you had error codes other than listed above or the error could not be eliminated by taking countermeasure described, contact us with recording the error codes.

Note

Specifications and appearance of the product may be changed without prior notification.



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