

Takara Bio USA, Inc.

# SMARTer™ Apollo™ System User Manual

Cat. No. 640078

(121417)

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## I. Introduction

We appreciate your purchase of the SMARTer Apollo system, which utilizes Magtration® technology for separation of magnetic particles. This manual is a guide for the user to operate the instrument safely and effectively. Please read this manual thoroughly to understand the instrument before starting operation. Keep this manual close to the instrument as a quick reference for all the operators as needed.

- Do not operate the instrument without fully understanding instructions described in this manual.
- Always keep this manual handy for easy reference at any time.
- Please inform us if this manual is lost or damaged.

## II. List of Components

**Table 1. List of components provided with the SMARTer Apollo system.**



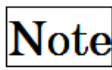



No.	Description	Qty.	Remarks
1	SMARTer Apollo System Main Body	1	
2	Front Door Handle	1	With 2 fixing screws
3	96 Tip Rack	3	
4	Reagent Reservoir Rack	1	
5	Mini-Tube Rack	1	For 1.1 ml tubes
6	PCR Tube Retention Plates	2	
7	Waste Tip Box	1	Content
8	Waste Chute	1	
9	Stylus Pen	1	
10	Stylus Pen Holder	1	
11	AC240V Power Cable	1	
12	AC110V Power Cable	1	
13	O-rings	8	
14	Silicon Grease	1	For O-rings
15	Fuse	1	
16	User Manual	1	This manual
17	Package Checklist	1	

### III. Safety Information

Most problems occur from improper use of the instrument and when safety instructions are not followed. Please read this manual thoroughly to understand and to get familiar with preventive measures so any problems in instrument operation can be avoided.

#### A. Symbols

In this manual we put symbols next to important instructions regarding safe use of the instrument. Details of all symbols are provided below.

	<b>Warning</b>	This symbol indicates the possibility that one could be killed or seriously injured when an incorrect operation is performed.
	<b>Caution</b>	This symbol indicates the possibility that one could be injured when an incorrect operation is performed.
		Denotes information to be emphasized or added for important points. You are advised to pay close attention to these when operating the instrument.
		This symbol indicates caution against electric shock.
		This circled symbol indicates actions that are prohibited. Details are illustrated inside or next to 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 the AC plug from a wall outlet).



The following precautionary instructions are included to ensure the safe operation of your SMARTer Apollo System. Please always keep this manual near the instrument or operator. Failure to comply with the instructions in this manual will void the manufacturer's warranty. If the instrument is not performing as expected, immediately turn off the main-power switch and unplug power cable, then contact us.

## B. Installation and Storage

Avoid the following places for the installation of this instrument. Installing this instruments in such places may cause damage to the instrument.

Do not install in a place with

- direct sunlight
- vibration, high humidity or dust
- strong electric or magnetic fields
- possibility of liquid or oil splashing on the instrument
- flammable or corrosive gas or high heat



Unplug power cable from wall outlet when instrument is likely to not be in use for extended periods of time.



Unplug AC  
power cable

## C. Precautions for Instrument Operation

- To eliminate the possibility of biohazard contamination from samples or extracted/purified products, use a mask, goggles and gloves while operating the instrument for your safety.
- Pay close attention when handling samples with high risk of biohazard.
- When operating the instrument under low temperature conditions, keep the instrument powered on even when not in use.
- Be sure to avoid any foreign materials from getting into the instrument.
- Do not scratch or press the operation panel using knives or things with sharp edges.
- Replacement of the fuse shall be made by field service personnel authorized by Takara Bio. Please contact us for fuse replacement.

## D. Warranty Period

- 12 months after installation, regardless of use.
- This warranty excludes the problems derived from inadequate storage, improper use or operation, repair/modification/maintenance of the instrument by people who are not authorized by us, even within the warranty period.

## E. Abolishment

Contact us when you want to recycle the instrument.

## F. Actions in Case of Emergency

In the instance when the instrument gets extremely hot, is smoking, giving off an abnormal smell, etc., immediately unplug the power cable from the wall outlet to avoid fire or electric shock to you and contact us for repair.



Unplug AC  
power cable

When foreign material or water splashes over or gets inside the instrument, immediately unplug the power cable from the wall outlet to avoid fire or electric shock to you and contact us.



Unplug AC  
power cable

When the power cable is damaged (core wire exposed or broken), immediately unplug the power cable from the wall outlet to avoid fire or electric shock to you and contact us.



Unplug AC  
power cable

## IV. Specifications

The SMARTer Apollo system provides a complete, walkaway solution for next-generation sequencing (NGS) library-prep applications using validated protocols and chemistries. In addition to library prep, the SMARTer Apollo system also employs in-tip magnetic bead separation, for a variety of magnetic bead applications such as PCR clean up, poly A enrichment, rRNA depletion, and size selection.

### A. Features

- Simple operation using a graphical user interface
- Compact design with minimal installation footprint
- High availability of various types of magnetic particle reactions by using special protocol development software
- Simultaneous processing of up to 8 samples by 8 nozzles (batch processing of up to 96 samples)
- Reduced running cost by using reagent dispensing function and by using commercially available microtiter plates

**B. Performance Specifications**

<b>Instrument type:</b>	Desktop
<b>Throughput:</b>	Samples: 1–96 samples/batch depending on protocol type
	Processing time: about 30 min/ 1–8 samples
<b>Temperature control:</b>	Two Heat/Cool Blocks: 4–95°C
<b>Handling volume:</b>	5–200 µl
<b>Dispensing accuracy*:</b>	5–10 µl less than CV 20 %
	11–20 µl less than CV 10%
	21–200 µl less than CV 2%

\* Accuracy was measured with distilled water at room temperature 20–25°C.

**NOTE:** Processing time depends on the protocol being performed.

**C. Size, Weight and Power Requirements**

**Size:** 800 mm (W) x 700 mm (D) x 675 mm (H) (disregarding prongs)

**Weight:** 97 kg (~214 lbs) (excluding accessories and disposables)

**Power Required:** AC100 – 240 V, 50/60 Hz, 440 VA

**Caution**

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

**D. Environmental Requirements**

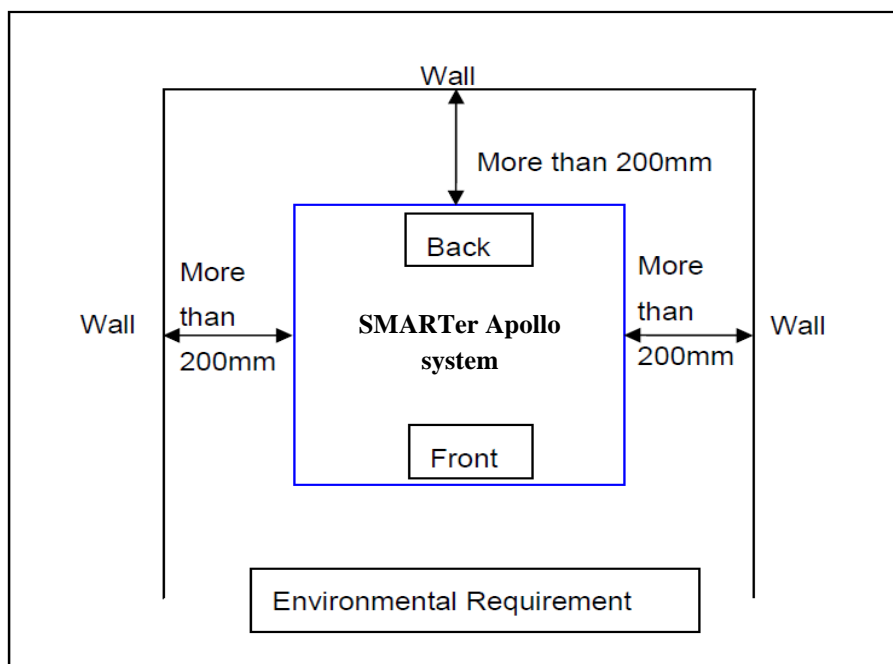
**Temperature:** 15°C–30°C

**Relative Humidity:** 15–75% Non-condensing

**Altitude:** Up to 2,000 m

**Space:** maintain a minimum distance between the walls and instrument as shown below for ventilation, maintenance work, etc. Also keep more than 200 mm of space above the instrument.





**Figure 1. Requirements for proper placement of the SMARTer Apollo system.** The instrument should be placed such that there is a distance of at least 200 mm between the instrument and any surrounding walls.



### Caution

- Place the instrument on a horizontal surface.
- Do not place the instrument where there is direct sunlight or vibration.
- When operating the instrument in a cold chamber or cold room, keep the instrument powered on even when not in use to avoid formation of dew.

## E. About Caution Labels Inside the Instrument

### 1. Caution label for high temperature

Place attached: Heat/Cool Block

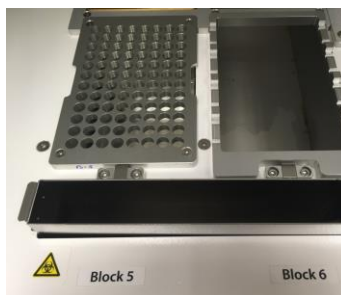


### Caution

The part where the yellow label is attached becomes hot (see image above). Do not touch this area while handling the instrument.

## 2. Caution Label for Biohazard

Place attached: Waste Chute



Caution

The part where this label is attached (inside cover) has the possibility of biohazard contamination with samples or extracted/purified products. Take care to avoid contamination.

## V. System Components

### A. Front View

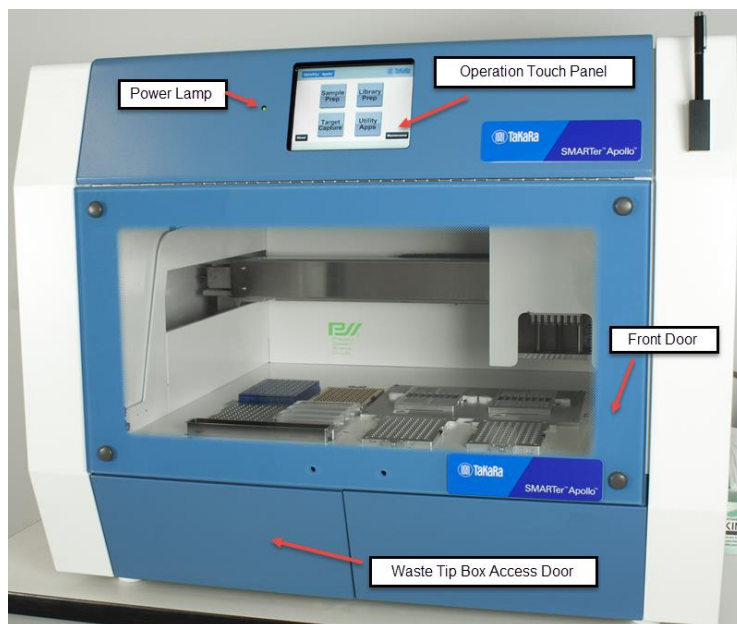


Figure 2. Front view of the SMARTer Apollo system.

**NOTE:** The Power Lamp lights up (green light) when the machine is powered on.

## B. Right-side View

On the right side of the instrument, the Power Switch is located towards the front and the Power Inlet Connector and Fuse Unit are located towards the back.

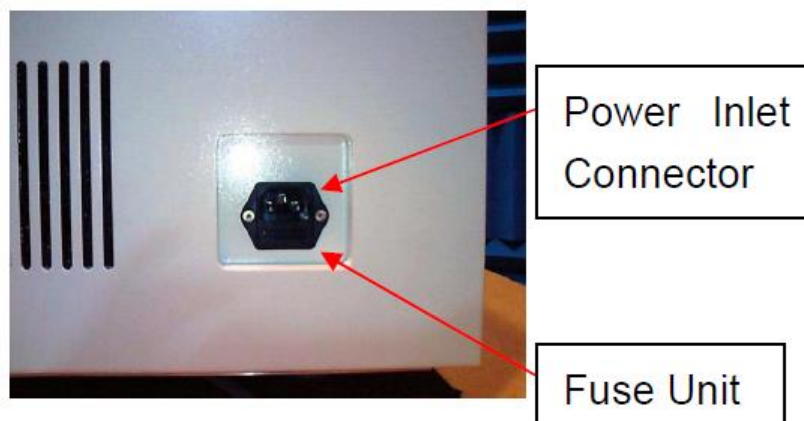


Figure 3. Right-side view of the instrument showing the position of Power Inlet Connector and the Fuse Unit.

### 1. Details of the Right-side View (Front)



### 2. Details of Right-side View (Back)



**NOTE:** Replacement of the fuse should be performed by field service personnel authorized by Takara Bio. Contact us regarding fuse replacement.

## C. Internal Components

The Magtration Unit and the Stage Unit are located inside the instrument.

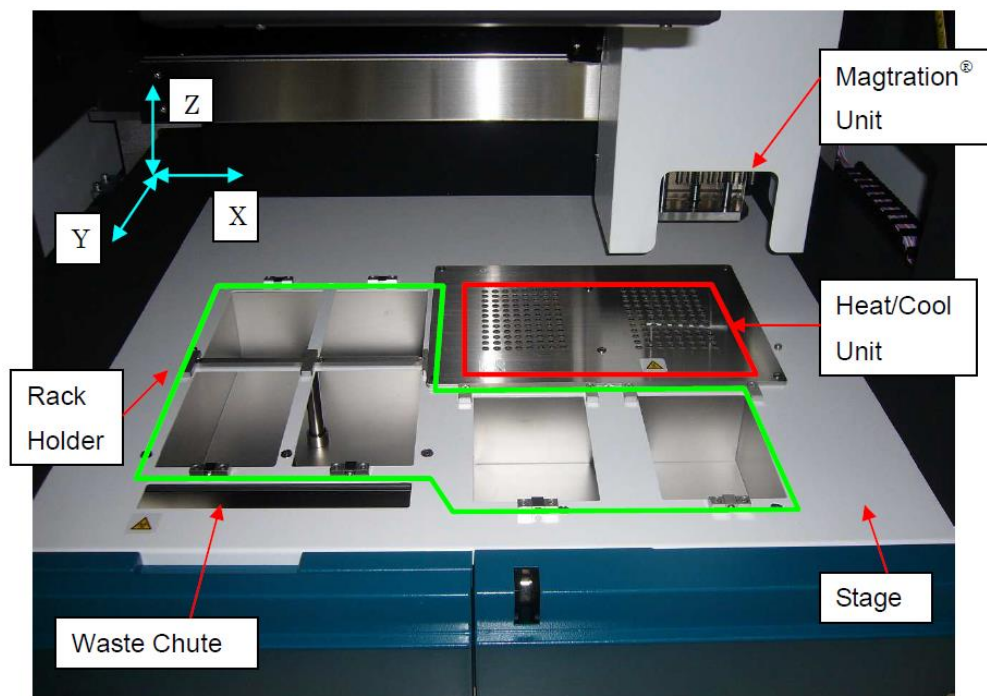


Figure 4. Location of the Magtration Unit and the Stage Unit inside the instrument.

### Magtration Unit

**Nozzle Unit:** This unit has 8 nozzles to process up to 8 samples simultaneously with accurate and rapid aspiration/dispensing.

**Magnet:** Eight powerful magnets are aligned with 8 tips to simultaneously separate magnetic particles for up to 8 samples.

### Stage Unit

**Heat/Cool Unit:** (indicated by the red box ■ in Figure 4, above)

Two Heat/Cool Units are equipped and can hold PCR plates. Temperature can be set from 4 to 90°C depending on protocols.

**Rack Holder:** (indicated by the green box ■ in Figure 4, above)

Racks and Disposables to be used vary by protocols. Refer to the application manual of the protocol you are following for details.

**Waste Chute:** It leads the waste tips and liquid to the Waste Tip Box.

### Example of loading racks and disposables

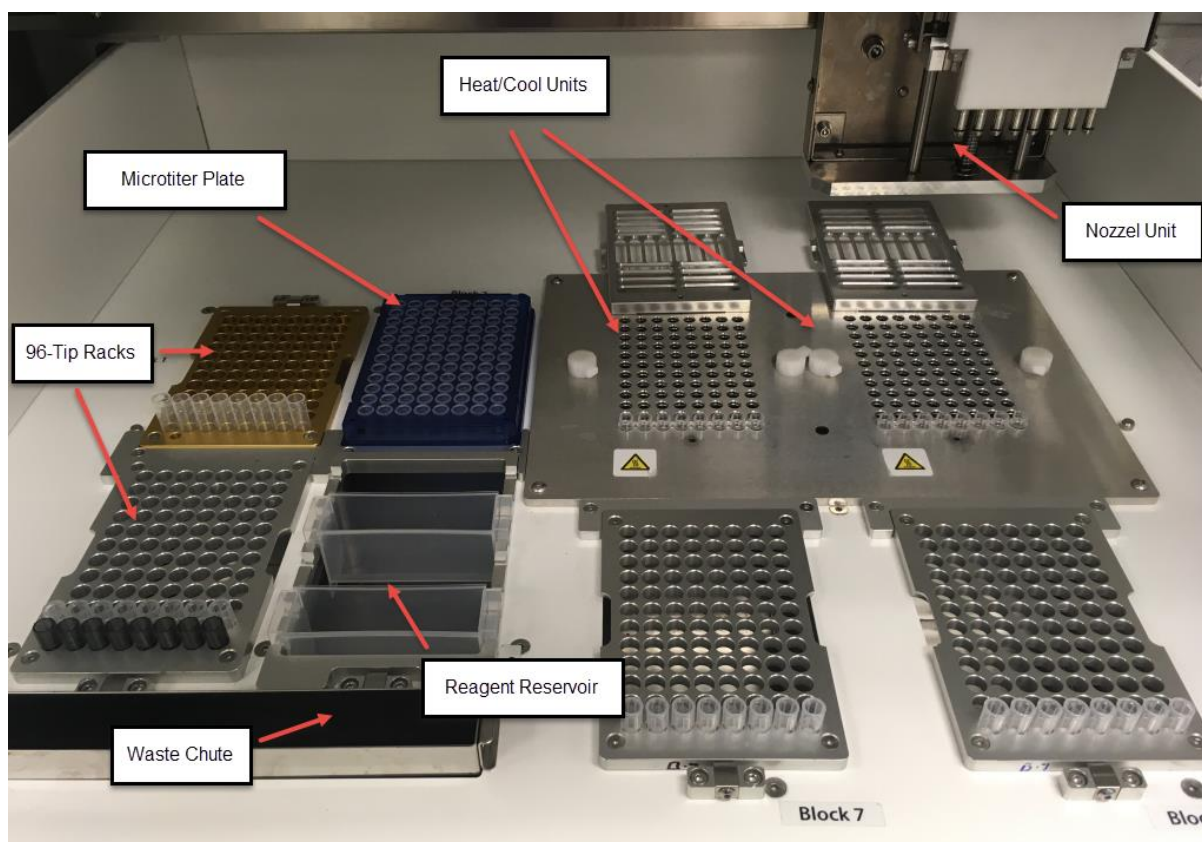


Figure 5. Image showing the location of the disposables on the Stage Unit.

**96 Tip Rack:** Holds 8 x 12 DN70 Tips.

**Reagent Reservoir Rack:** Holds Reagent Container L.

**Microtiter Plates:** Holds 96-well Microtiter plates.

**Waste Chute:** Place where waste tips, etc. are discarded.

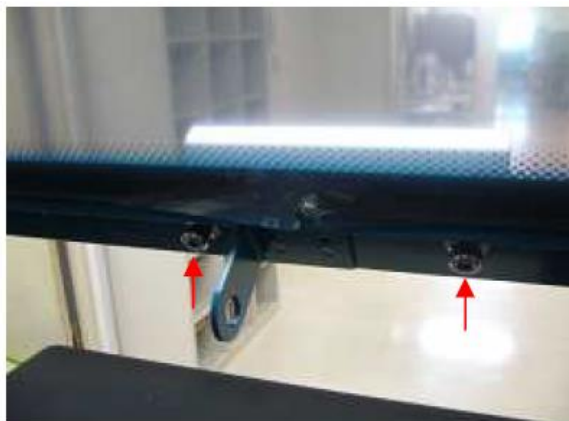
**NOTE:** The above layout is an example and will vary by protocol.

## VI. Installation

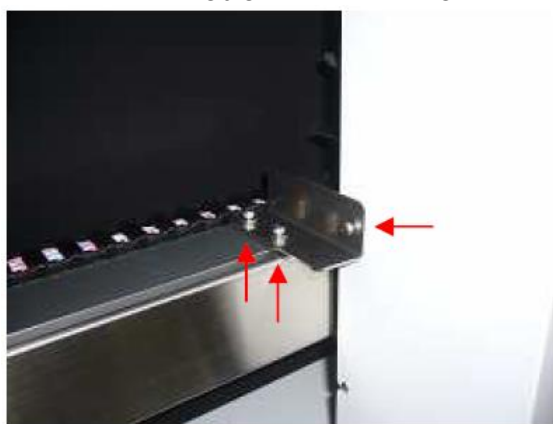
### A. Setup Procedure

**NOTE:** Setup should be performed by Field support personnel authorized by Takara Bio.

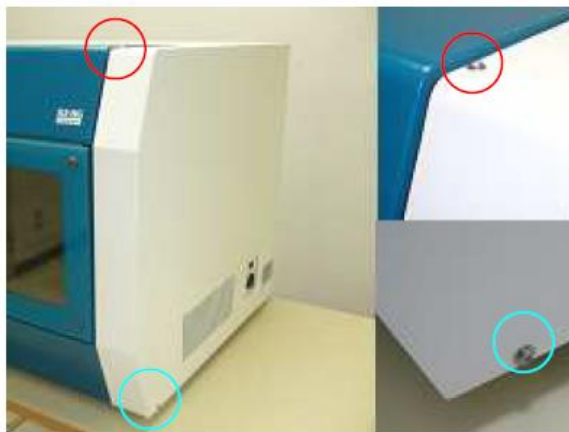
1. Remove protection films attached on the instrument.
2. Open Front Door and fix Grip of Front Door by two screws (supplied).



3. Remove the fixing jig for X-Axis Magtration Unit fixed by 3 screws inside the instrument.



4. Remove cushioning and desiccant agents.
5. Open Right-side Cover by removing 2 fixing screws.



○: long screw  
○: short screw

6. Remove Y-Axis fixing jig to right-side base by removing 3 fixing screws. Then replace Right-side Cover and fix it with two screws.



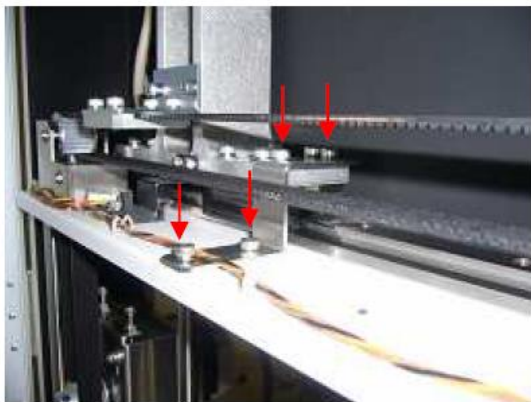


7. Open Left-side Cover by removing 2 fixing screws.



○: long screw  
○: short screw

8. Remove Y-Axis fixing jig to left-side base by removing 4 fixing screws. Then replace Left-side Cover and fix it with two screws.



9. Connect Power Cable to Power Inlet Connector on the right side of the instrument. Then turn Power Switch on assuring that Front Door and Waste Tip Box Door are closed securely.

**Caution**

Do not use power cable other than the one provided to avoid temporary blackout or fire breaking.

10. 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 the Magtration Unit and the Stage Unit to protect nozzles from free movement.

## VII. Accessories and Disposables

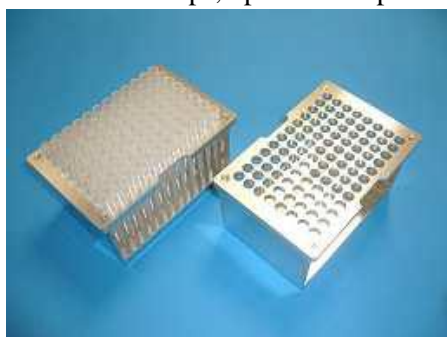
### A. Accessories

Table 2. List of accessories provided with the instrument.

Description	Qty.
96 Tip Rack	3
Reagent Reservoir Rack	1
Mini-Tube Rack	1
PCR Tube Retention Plates	2
Waste Tip Box	1
Waste Chute	1
Stylus Pen	1
Stylus Pen Holder	1
AC240V Power Cable	1
AC110V Power Cable	1
O-ring	8
Silicon Grease	1
Fuse	1

- **96-Tip Rack**

Holds DN70 Tips, up to 8 x 12 pieces.





- **Reagent Reservoir Rack**

Holds up to 4 Reagent Containers.



- **Waste Tip Box**

The Waste Tip Box receives discarded tips coming down through the Waste Chute.



- **Waste Chute**

The Waste Chute directs discarded tips to the Waste Tip Box.



- **Stylus Pen**

The Stylus Pen is used to operate the instrument through the Touch Panel. It operates like a ballpoint pen.



- **Stylus Pen Holder**

The Stylus Pen Holder is a holder for the Stylus Pen and can be magnetically attached onto the instrument surface.



## B. Disposables

### 1. Disposables available from Takara Bio

Table 3. Disposables available from Takara Bio

Cat. No.	Product Description
640089	SMARTer Apollo 96 Tip Rack
640085	SMARTer Apollo Piercing Tips
640084	SMARTer Apollo Filter Tips
640082	SMARTer Apollo 0.2 ml PCR 8-Tube Strips, Clear
640086	SMARTer Apollo Caps for 0.2 ml PCR 8-Tube Strips, Clear
640083	SMARTer Apollo Microtiter Plates
640087	SMARTer Apollo Reservoirs
640088	SMARTer Apollo 1.1 mL MiniTubes

- SMARTer Apollo Reservoirs (Cat. No. 640087)



- SMARTer Apollo Filter Tips (Cat. No. 640084)



## C. Reagents

Refer to your specific 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.
- When discarding disposables, follows the instructions defined by your facility or regional laws.

## VIII. Directions for Use

### A. Front Door Operation

The Front Door moves up and down, and it is held at the top when fully moved up. Hold only the Grip/handle of the Front Door to open or close the door to avoid getting your fingers pinched. The Front Door is locked during operation. Open the Front Door after the instrument has finished its operation.



Figure 6. Image showing the operation of the Front Door.



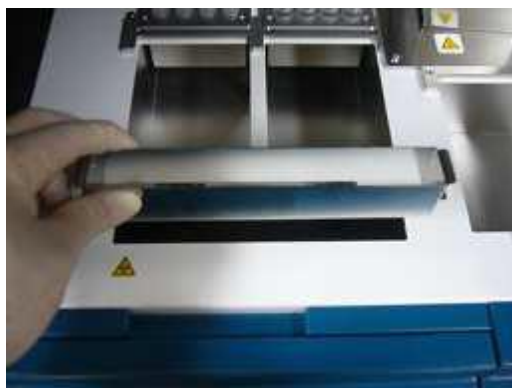
### Caution

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

## B. Putting on and Taking out the Waste Tip Box

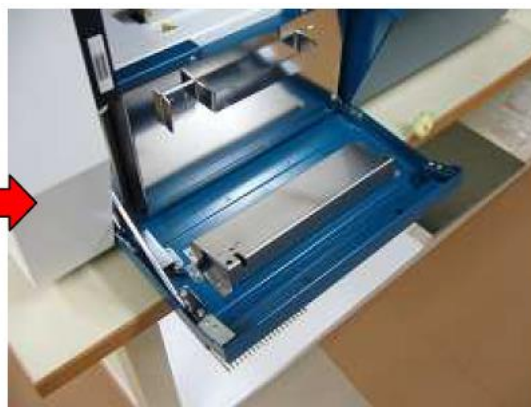
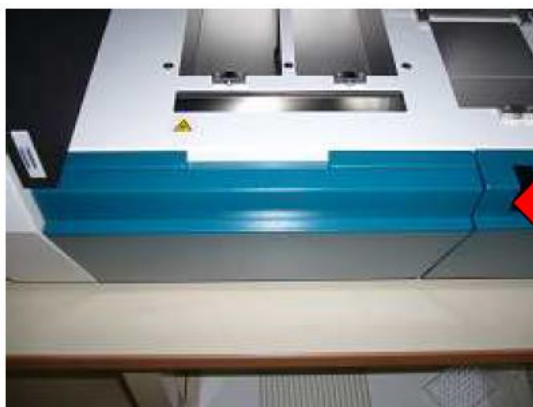
### 1. Waste Chute

The Waste Chute can be removed by taking it out from Waste Tip Discard Hole for cleaning.



### 2. Waste Tip Box

The Waste Tip Box can be removed for discarding tips or for cleaning. Open the Front Door first and then open the access door for the Waste Tip box. Take out the Waste Tip Box by holding its grip. Make sure that the access door for the Waste Tip Box is closed after setting the Waste Tip Box, otherwise you cannot start a protocol run.



### Caution

Move the access door for the Waste Tip Box gently without excessive force to avoid damaging it.

## C. Setting Racks and Disposables in Place

### 1. Setting Racks

Set racks on their designated position and make sure they are set securely.

96 Tip Rack



No positioning

Reagent Reservoir Rack



Position the cut to Spring

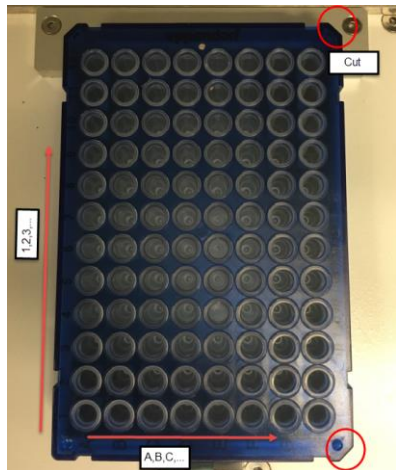


### Caution

- When Racks are not correctly positioned, tip pickup failure, inaccurate aspiration/dispensing, or instrument malfunction may occur.
- When Reagent Tip Racks are not correctly positioned, tips cannot be picked up resulting in instrument malfunction.

## 2. Setting Microtiter Plates

Set the Microtiter Plates in positions designated by the selected application, following positioning directions.

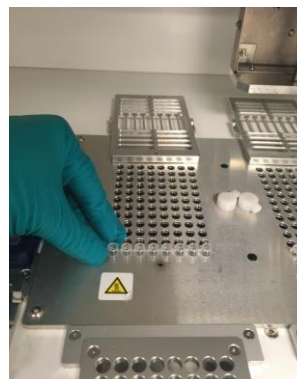
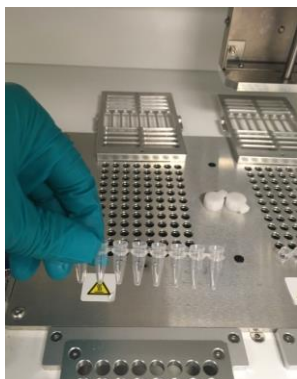


### Caution

- When Microtiter Plates are not positioned correctly, adequate aspiration/dispensing or liquid mixing may not be performed, resulting in inadequate extraction/purification.
- If non-recommended microtiter plates are used, adequate aspiration/dispensing or liquid mixing may not be performed resulting in inadequate extraction/purification.

## 3. Setting PCR Tubes onto the Heat/Cool Unit

Place the PCR Tubes on the Heat/Cool Unit by following the positioning directions and push them down to fit securely.



### Caution

- When the PCR Tubes are not positioned correctly, adequate aspiration/dispensing or liquid mixing may not be performed, resulting in inadequate extraction/purification.
- If a non-recommended PCR Tubes are used, adequate aspiration/dispensing or liquid mixing may not be performed, resulting in inadequate extraction/purification.

## IX. Basic Operation

### A. Start Up and Shut Down Procedure

#### 1. Start Up

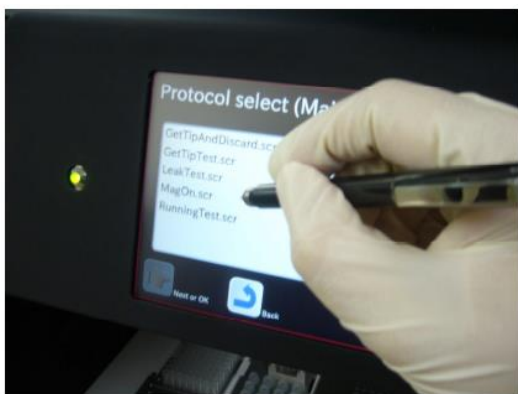
1. Close the access door for the Waste Tip Box and the Front Door. (Refer to Section VIII.B, “Putting on and Taking out the Waste Tip Box”, and Section VIII.A, “Front Door Operation”.)
2. Turn on the Power Switch located on the right side of the instrument.
3. The instrument starts up and the Touch Panel screen is activated.

#### 2. Shut Down

1. Turn the instrument power off, making sure that the instrument is not operating\*.  
\* If it is operating, stop operation by pressing the “Protocol Stop” button, and then turn off the system.

### B. Touch Panel Operation

Using the Stylus Pen, select the function desired.



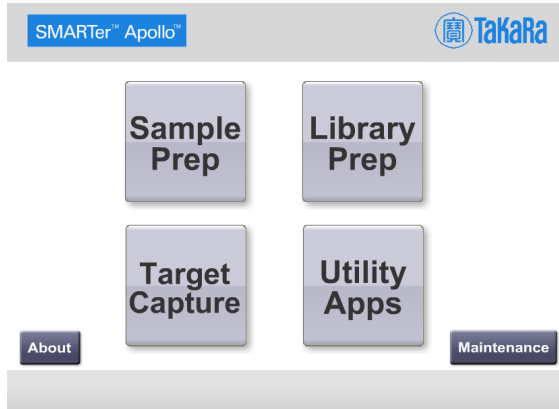
#### Caution

- Operate the Touch Panel with the Stylus Pen gently without giving excessive force to avoid damaging it.
- Use only the Stylus Pen provided to avoid damaging the Touch Panel screen with other tools with sharp edges.



## C. Running a GUI Protocol

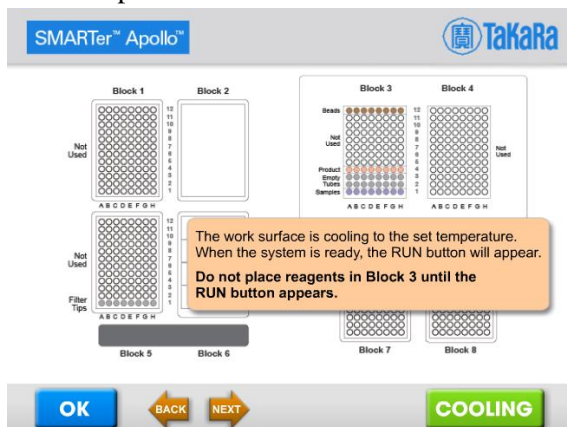
1. Select the desired operation from the MAIN screen.



2. For example, select Utility Apps to perform PCR Cleanup.



3. Select the desired sample size PCR cleanup on the Utility Apps screen. For example, PCR Cleanup 8 for 8 samples.



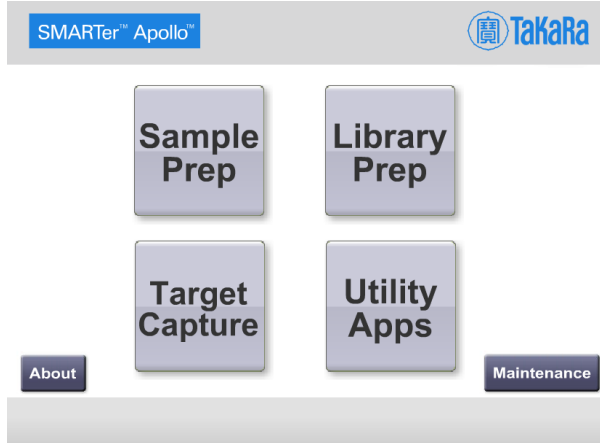
4. Using the “Back” and “Next” buttons, follow on-screen block-by-block instructions.
5. Once the deck is set up and cooled down, the RUN button will appear.
6. Click on the Run button to start the run.



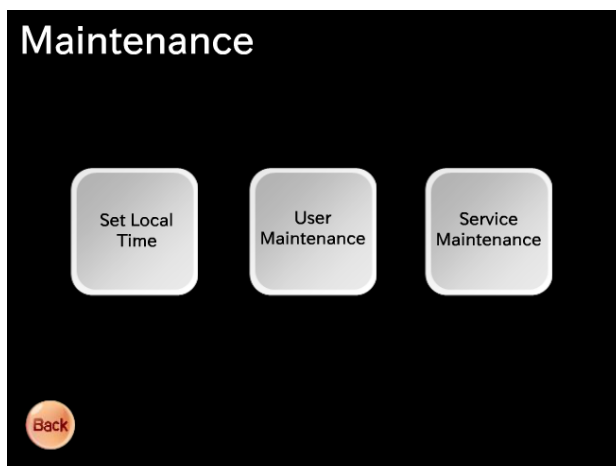
## D. Running a User Maintenance Protocol

Some protocols are stored in User Maintenance folder. To run the User Maintenance protocols,

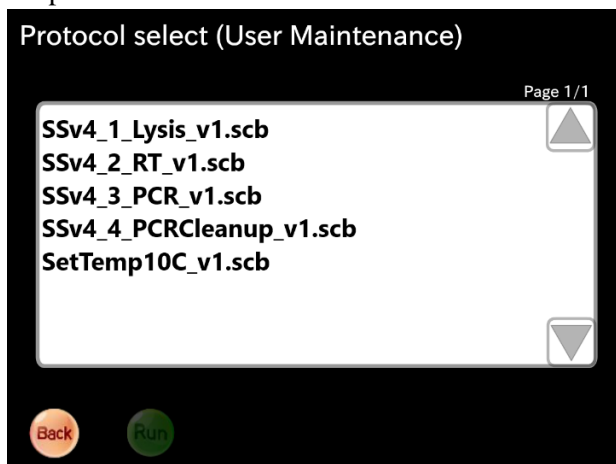
1. Select **Maintenance** on bottom right of the screen.



2. Select User Maintenance on next screen as shown

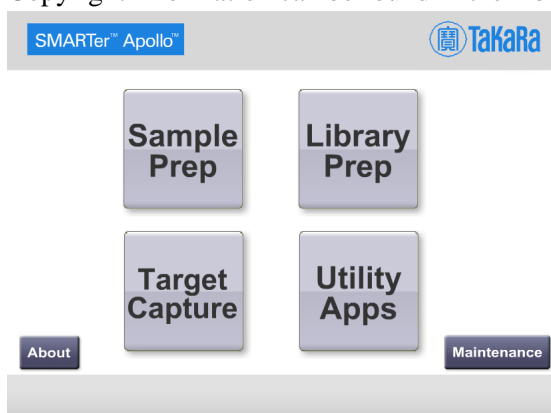


3. From the list of protocols, select the desired protocols and hit Run. See below for an example screen for protocol selection.

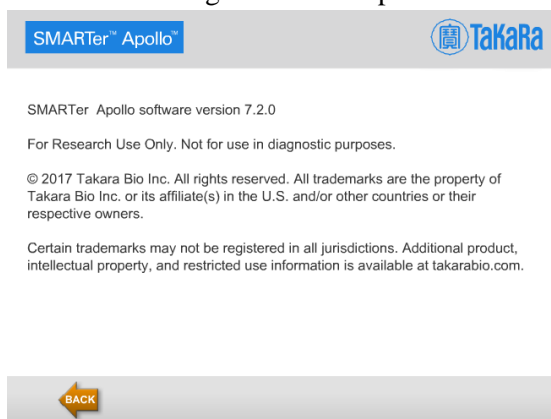


## E. About Page

1. Copyright information can be found in the About page. Select About on bottom left corner.



2. Select BACK to go back to the previous screen.



## X. Instrument Care and Maintenance

Items for maintenance activity are listed below.

**Table 4. Maintenance checklist**

Item	Frequency	Done By
<b>Cleaning Stage and Racks</b>	After every run	User
<b>Cleaning Magtration Unit</b>	After every run	User
<b>Greasing O-rings</b>	Once every two weeks	User
<b>Replacing O-rings</b>	Every six months	Field Service
<b>Maintenance</b>	Once a year	Field Service



### Caution

- **Potential biohazards from samples or extracted/purified products cannot be completely eliminated while operating the instrument. Use a mask, goggles, and gloves while operating the instrument for your safety.**
- **Maintenance work should be done with the instrument powered off.**
- **Pay close attention when cleaning areas where caution labels are attached.**

**NOTES:**

- Maintenance work should be done as indicated, otherwise the results of extraction/purification runs may not be assured.
- Contact us for maintenance work that should be done by Field Service personnel.
- Stage and Racks should be cleaned after every run.
- Nozzles and the Piercing Unit of the Magtration Unit should be cleaned after every run.

**A. Cleaning Procedure****Components to be cleaned:**

- Stage
- Magtration Unit
- All Racks
- Waste Chute
- Waste Tip Box

Beside the items listed above, all accessories inside the instrument need to be cleaned.

**Cleaning method:**

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

- Water
- 70% Ethanol

**NOTE:** Do not use alcohol when cleaning the Touch Panel or the Clear Panel of the Front Door. Use water for those parts.

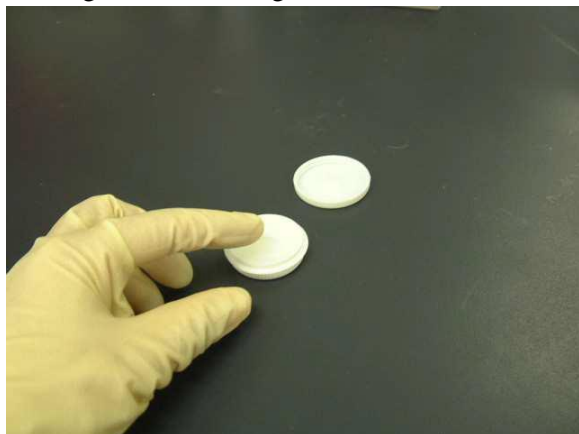
**B. Greasing O-rings**

Grease O-rings once every two weeks to avoid inadequate picking of tips and/or liquid leakage.

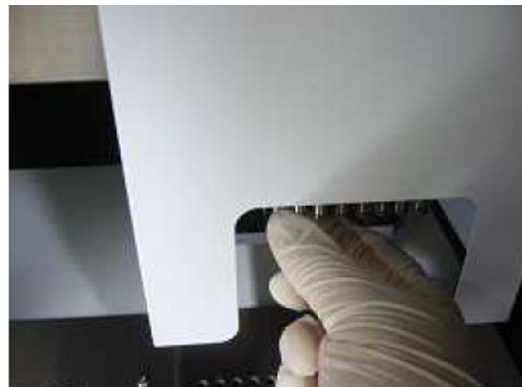
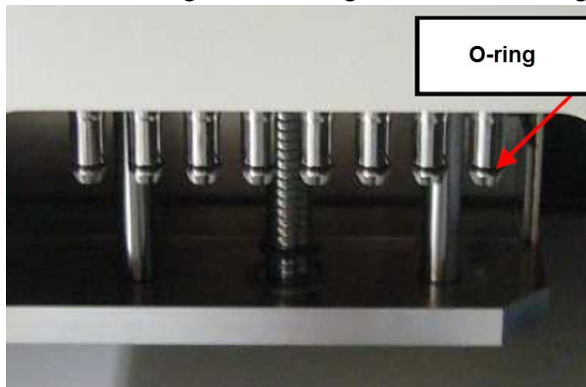
1. Remove old grease.



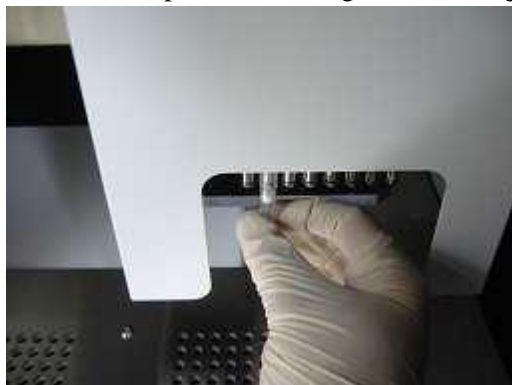
2. Wear gloves and put a small amount of silicon grease on your fingertip. Then spread silicon grease by rubbing it on the O-rings.



3. Put the silicon-greased O-rings (black rubber rings) back on the Nozzles.



4. Use DN70 Tips to make the greased-O-rings fit.



5. Remove all excessive silicon grease from the Nozzle ends and Tip Ejector, using paper, such as a Kimwipe.



### **Caution**

**Be sure not to apply too much silicon grease, because it may result in insufficient tip-off operation.**

## XI. Troubleshooting

### A. Error Reported During Protocol Run



Error code reported is shown in place of “XXXXXX” in the above screen and the corresponding error message is displayed under the code. Refer to Section XII, “List of Common Error Codes” for a list of common error codes and countermeasures to be taken.

1. The screen shown above is displayed and the instrument aborts its operation when an error occurs during a protocol run.
2. Take appropriate countermeasures for the error, referring to the List of Error Codes in Section XII.
3. When contacting us for support, be sure to include
  - a. A picture of error displayed on the SMARTer Apollo system touchscreen.
  - b. A picture of the SMARTer Apollo system work surface.
  - c. The name of the protocol running
  - d. Approximate runtime prior to the crash
  - e. Any other relevant information



#### Caution

**The protocol run aborted by an error cannot be restarted from the point of suspension.**

**NOTE:** Repeat the same countermeasure when the same error occurs in the next run of the protocol. Contact us when the countermeasure does not resolve the problem.

### B. Suspending or Aborting a Protocol Run

1. When you want to suspend a protocol run operation, select the **Suspend** button in the display to suspend instrument operation. It may take some time before the operation is suspended, depending on the process under execution.
2. Select the **START** button to restart and continue the protocol run.
3. When you want to abort a protocol run, select the **STOP** button. A “Protocol Select” screen is displayed.



#### Caution

**The aborted protocol cannot be restarted from its point of suspension.**

## C. Frequently Reported Problems

Problem	Presumable cause	Countermeasures to be taken
<b>Power is not supplied to instrument</b>	AC Power Cable is not connected properly.	Check for connection of AC Power Cable. Be sure to use the Power Cable supplied with the instrument.
	Fuse is burned out.	Contact us when fuse needs to be replaced.
<b>Displayed characters are not readable</b>	Light intensity is low.	Adjust light intensity properly by rotating the screw located on the right of the Display with a flat-blade screwdriver.
<b>Error code is displayed</b>	Causes vary by error code.	Record the error code displayed and take appropriate countermeasures, referring to the “List of Error Codes” (Section XII, below). If the countermeasure taken does not eliminate the problem, contact us for assistance.
<b>Protocol was started with an incomplete setting of tips or other disposables</b>		<p>Be sure to confirm appropriate setting of reagents and disposables, before starting a protocol run. If you want to add disposables after a protocol is started, press <b>STOP</b> to abort instrument operation. It is strongly recommended to restart the protocol run from the beginning after adding disposables.</p> <p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>If you continue the protocol run from the halted point after adding disposables, you may not get the desired results.</li> <li>When the Front Door is opened after halting operation, power to the motors is shut for safety, resulting in the displacement of stopping positions of motors.</li> </ul>
<b>Liquid leakage from the tip-end or big difference in liquid level among lanes</b>	O-rings are not greased enough, or O-rings are deteriorated.	<p>Grease O-rings properly or replace O-rings. It is recommended that replacement of O-rings is made by appropriately trained field service personnel to avoid damaging the nozzles.</p> <p><b>NOTE:</b> Replacing the O-rings by yourself may result in damage to the instrument.</p>
	Disposables are not set properly.	<p>Check for proper setting of the Microtiter Plates, PCR tubes, etc.</p> <p><b>NOTE:</b> using disposables other than the ones recommended may cause instrument malfunction. It is strongly recommended that you use the disposables designated for each protocol.</p>

## XII. List of Common Error Codes

Code no.	Presumable cause	Description	Countermeasures to be taken
2001	Axis: error	Axis error	Power cycle the instrument first and then Home all axes by running <b>True_Org_All_axis.scb</b> . Step-by-step instructions are provided in Section XIII below
2002	Axis: Z bottom sensor	Z button sensor error	
2003	Axis: Hardware end limit error	End Limit Error (Hardware)	
2004	Axis: Software end limit error	End Limit Error (Software)	
2005	Interlock error	Generation of interlock	Sensor adjustment needed. Contact Field Support at <a href="mailto:field_support@takarabio.com">field_support@takarabio.com</a>
2006	Failed to initialize Motor	ORG-returning error	Contact Field Support
2007	Cannot move XY due to less height.		Power cycle the instrument first and then Home all axes by running <b>True_Org_All_axis.scb</b> . Step-by-step instructions are provided in Section XIII
2008	Cannot find tip		Check the deck layout and place tips as appropriate
2009	Forcibly closed by user		Restart the script from the beginning. A protocol run cannot be restarted from the point of suspension
2010	When Z is moved down, Nozzle may hit Comb		Contact Field Support
2019	Door lock error	Door lock error	Door lock parts may need to be replaced  Clear all foreign materials that may be blocking the door

### NOTES:

- Most of the errors listed above originate from inadequate setting of disposables/accessories or from an opened door. Be sure to check those before restarting a protocol run.
- If you encounter error codes other than the ones listed above or the error could not be eliminated by taking the countermeasure described, contact us with a description of the error codes at [field\\_support@takarabio.com](mailto:field_support@takarabio.com) or [techUS@takarabio.com](mailto:techUS@takarabio.com)

## XIII. Appendix



### A. Recovering a Run After a Crash

If the SMARTer Apollo system crashes during a run, please follow the instructions below. Call us and a technical support representative will assist you in trying to recover your samples.

1. Take a picture of error displayed on the SMARTer Apollo system touchscreen.
2. Take a picture of the SMARTer Apollo system work surface.
3. Transfer tubes in Block 3 to a 96-well plate, maintaining the orientation of the tubes. Cap the tubes. Place on ice. (optional)
4. Repeat for Block 4.
5. Send the following information to Field Support at [field\\_support@takarabio.com](mailto:field_support@takarabio.com):
  - a. Which protocol is running
  - b. How long has the protocol been running before the error occurred
  - c. Attach the pictures from 1 and 2
  - d. Any other relevant information

### B. Resetting the SMARTer Apollo system axes after a crash

If the SMARTer Apollo system crashes during a run, please follow the instructions below before beginning the next run. This procedure resets the X, Y, Z and P axes to their default setting.

1. On the SMARTer Apollo system interface:
  - a. Press 
  - b. Press 
  - c. In the window showing the available protocols, press: **True\_Org\_All\_axis.scb**
2. Press **Run** to run the script. The script takes <1 minute and resets the X, Y, Z and M axes.
3. When the run is complete, the screen will read **End Running** and **Ok** will appear on the bottom left of the screen.
  - a. If the **Ok** button appears, then the Apollo system is reset properly. Press **Ok** and continue to step 4.
  - b. If the **Ok** button does not appear, power off the instrument and repeat Steps 1–3.
4. Power off the SMARTer Apollo system. Wait at least 60 seconds before powering on again.
5. The SMARTer Apollo system is now reset and ready to run.



Contact Us	
Customer Service/Ordering	Technical Support
tel: 800.662.2566 (toll-free)	tel: 800.662.2566 (toll-free)
fax: 800.424.1350 (toll-free)	fax: 800.424.1350 (toll-free)
web: <a href="http://takarabio.com">takarabio.com</a>	web: <a href="http://takarabio.com">takarabio.com</a>
e-mail: <a href="mailto:ordersUS@takarabio.com">ordersUS@takarabio.com</a>	e-mail: <a href="mailto:techUS@takarabio.com">techUS@takarabio.com</a>

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