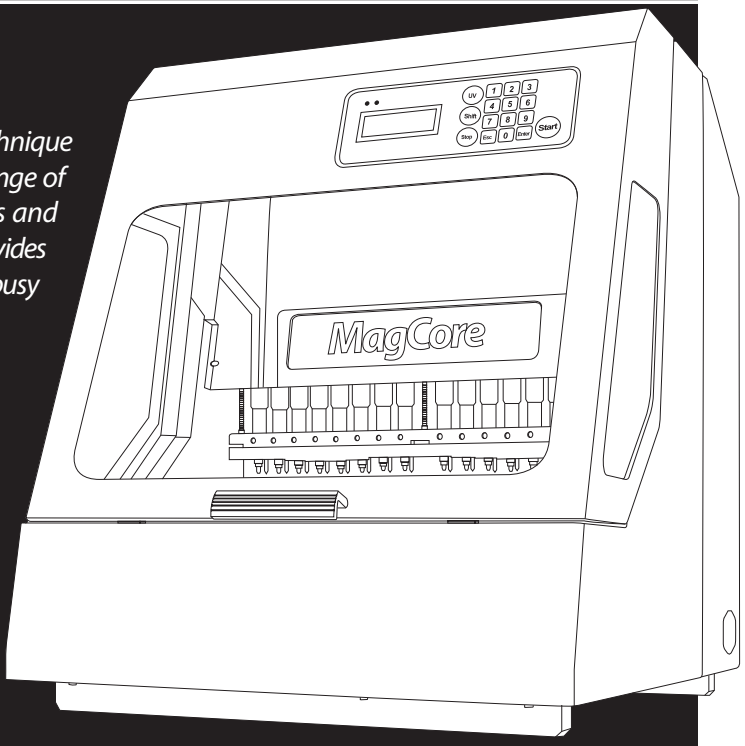
MagCore® HF16 Automated Nucleic Acid Extractor

MagCore® HF16

Reliable Nucleic Acid Purification

MagCore® HF16 is a simple, fast and cost-effective technique to automatically purify nucleic acids from a diverse range of sample sources. With the pre-programmed protocols and magnetic bead based reagent cartridges, the system provides consistent and stable nucleic acid purification for every busy laboratory.



Advantage

- ***Touch Button*** *operation means simplicity*
- ***Rapid Results*** *in about 30 minutes for DNA purification*
- ***Flexible Design*** *means single samples can be run with no waste*
- ***Batch Purify*** *up to 16 samples at one time*
- ***Diverse Purification*** *kits and protocols available*
- ***Economic Pricing*** *of reagents and instrument*

MagCore® HF16
Operation Manual

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Ver. 2012-1
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CE IVD

Safety Precautions

Before use

These WARNINGS and CAUTIONS are intended to protect you and other persons from injuries and damages. To ensure safe operation, please follow them carefully.

CAUTIONS

Risk Of Electric Shock
Do Not Open

CAUTION:

To Reduce The Risk Of Electric Shock, Do Not Remove Cover (Or Back).
No Userserviceable Parts Inside. Refer Servicing To Qualified Service Personnel.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle isintended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Be aware of contaimination by contagious specimens.

High temperature warning!!

DO NOT touch the heating block with this sticker attached, it may cause serious burning injuries.

CAUTION:

1. Handle the power supply cord carefully
Do not damage or deform the power supply cord. If it is damaged or deformed, it may cause electric shock or malfunction when used. When removing from wall outlet, be sure to remove by holding the plug attachment and not by pulling the cord.

2. Do not open the top cover
In order to prevent electric shock, do not open the top cover.

3. Do not place anything inside
Do not place metal objects or spill liquid inside the MagCore® System. Electric shock or malfunction may result.

Note On Use:

Avoid high temperatures.
Allow for sufficient heat dispersion when installed on a rack.

Handle the power cord carefully.
Hold the plug when unplugging the cord.

Keep the set free from moisture, water, and dust.

Unplug the power cord when not using the set for long periods of time.

Do not obstruct the ventilation space.

Do not let insecticides, benzene, and thinner come in contact with the set.

Never disassemble or modify the set in any way.

Do not let foreign objects in the set.

SAFETY INSTRUCTIONS

1. ***Read Instructions*** *– All the safety and operating instructions should be read before the product is operated.*
2. ***Retain Instructions*** *– The safety and operating instructions should be retained for future reference.*
3. ***Heed Warnings*** *– All warnings on the product and in the operating instructions should be adhered to.*
4. ***Follow Instructions*** *– All operating and use instructions should be followed.*
5. ***Cleaning*** *– Unplug this product from the wall outlet before cleaning. Only allow to use 75% of EtOH to clean the surface of instrument.*
6. ***Attachments*** *– Do not use attachments not recommended by the product manufacturer as they may cause hazards.*
7. ***Water and Moisture*** *– Do not use this product near water – for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.*
8. ***Accessories*** *– Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.*
9. ***Ventilation*** *– Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.*
10. ***Power Sources*** *– This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.*
11. ***Grounding or Polarization*** *– This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.*
12. ***Power-Cord Protection*** *– Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.*
13. ***Lightning*** *– For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.*
14. ***Overloading*** *– Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.*
15. ***Object and Liquid Entry*** *– Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.*
16. ***Servicing*** *– Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.*
17. ***Damage Requiring Service*** *– Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:*
    a) *When the power-supply cord or plug is damaged,*
    b) *If liquid has been spilled, or objects have fallen into the product,*
    c) *If the product has been exposed to rain or water,*
    d) *If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation,*
    e) *If the product has been dropped or damaged in any way, and*
    f) *When the product exhibits a distinct change in performance*
    – this indicates a need for service.
18. ***Replacement Parts*** *– When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.*
19. ***Safety Check*** *– Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.*
20. ***Heat*** *– The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products that produce heat.*

Specification

Model	HF16
System Method	Cellulose coated magnetic beads
System Components	1. Pipetting Unit: Dispensing, transferring, X-Y two axis movements. 2. Electric Control: Internal microprocessor. 3. UV Light: Power 5W, life duration >1,000 Hrs. 4. Heating Block: RT~100^{0}C. 5. Display Screen: 3 inches LCM Screen with keypress Panel 6. Accessories: T- Rack, Cartridge Rack , Empty Cartridges, Tip/Holders, Sample tube , Microcentrifugr Tube, Syringe O-ring and Grease.
Power Supply	Voltage: AC 100-240V; Frequency: 50/60Hz; Power Consumption >1.0KVA
Dimension	W550 X D660 X H680 (mm) W21.65 X D25.98 X H26.77 (inches)
Net Weight	70kg / 155lbs

Operating Paramenters

Processing Capacity	1~16 samples per batch
Processing Time	30-70 minutes (depends on sample type and method)
Sample Volume	200µl /400µl /1,200µl
Elution Volume	60µl /100µl /150µl /200 µl
Yield	Average 6µg Genomic DNA from 200µl human whole blood Average 1µg total RNA from 400µl human whole blood
Purity	DNA : O.D $A_{260/280}$ ratio 1.8 ± 0.1 RNA : O.D $A_{260/280}$ ratio 2.0 ± 0.2

Operating Environment

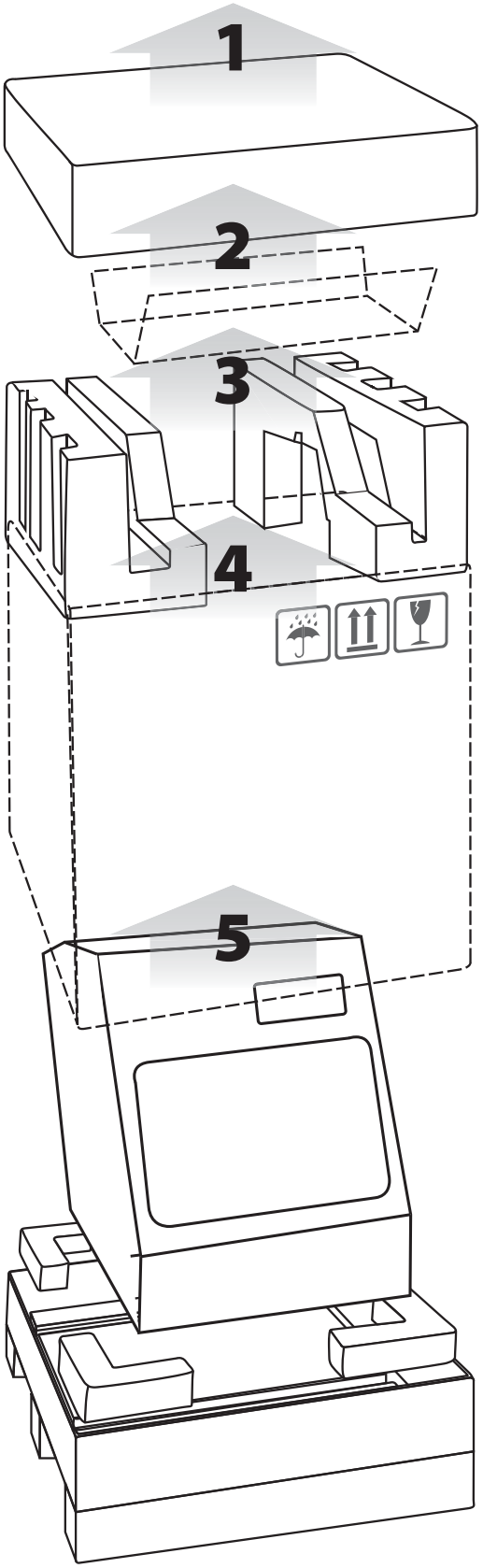
Temperatures allowed during transportation storage packaging	15℃~35℃
Temperatures allowed during operation	+18℃ to +30^{0}C
Pollution Degree	Indoor

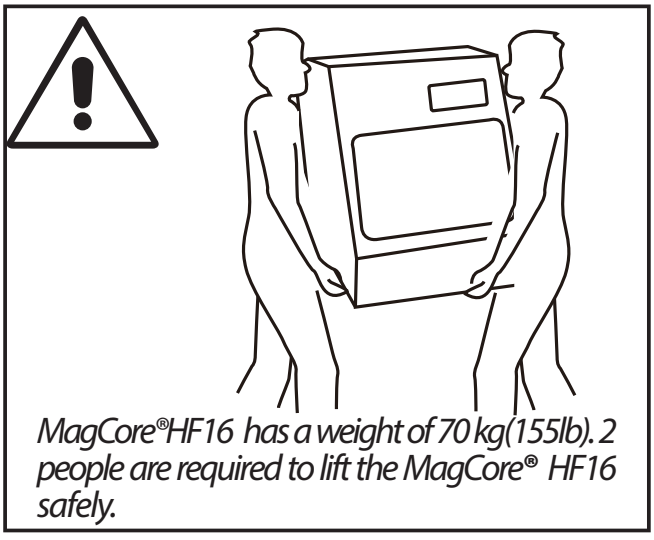
Applications

Whole Blood (200µl /400µl), Viral Nucleic Acid (DNA/RNA), Tissue Genomic , Plant Genomic DNA Bacteria, Cultured Cells, Total RNA, Large volume whole blood (1,200µl)

Package Contents

1. Open the package cover.
2. Remove accessories.
3. Remove the bump buffer.
4. Remove outer carton case.
5. Take out of the machine .





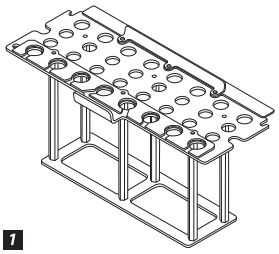
MagCore®HF16 has a weight of 70 kg(155lb). 2 people are required to lift the MagCore® HF16 safely.

Please put MagCore® HF16 on a solid worktop table without pulley. Do not place on the same table of other facilities which need to be kept away from vibration.

Packaging materials are recyclable.

Recommends to keep the package for future transportation or movement.

Accessories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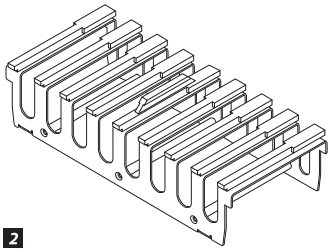
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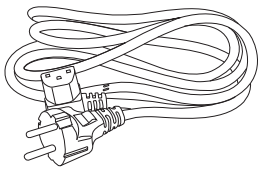
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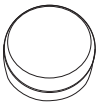
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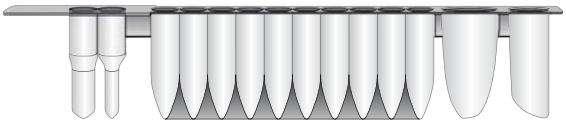
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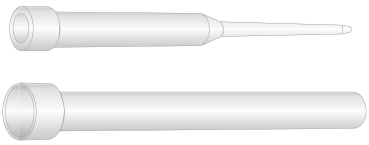
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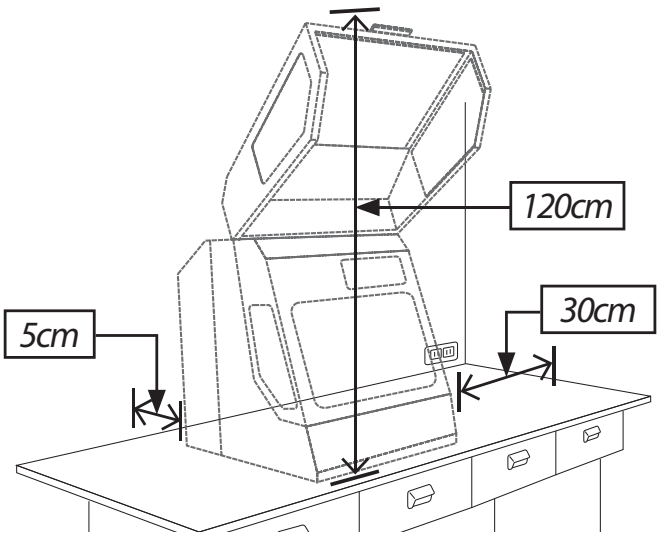
Check that the following parts are included in addition to the main unit:

1 *T-Rack.....2*	2 *Cartridge Rack.....2*	3 *Power Cable.....1*	4 *Lubricating silicon grease.....1*
5 *O-Rings.....16*	6 *Cartridge.....32*	7 *Sample/Elution Tube.....32*	8 *Tip/Tip Holder.....32*

Accessory No: 6, 7, 8 are installation tools, please keep clean for permanent use.

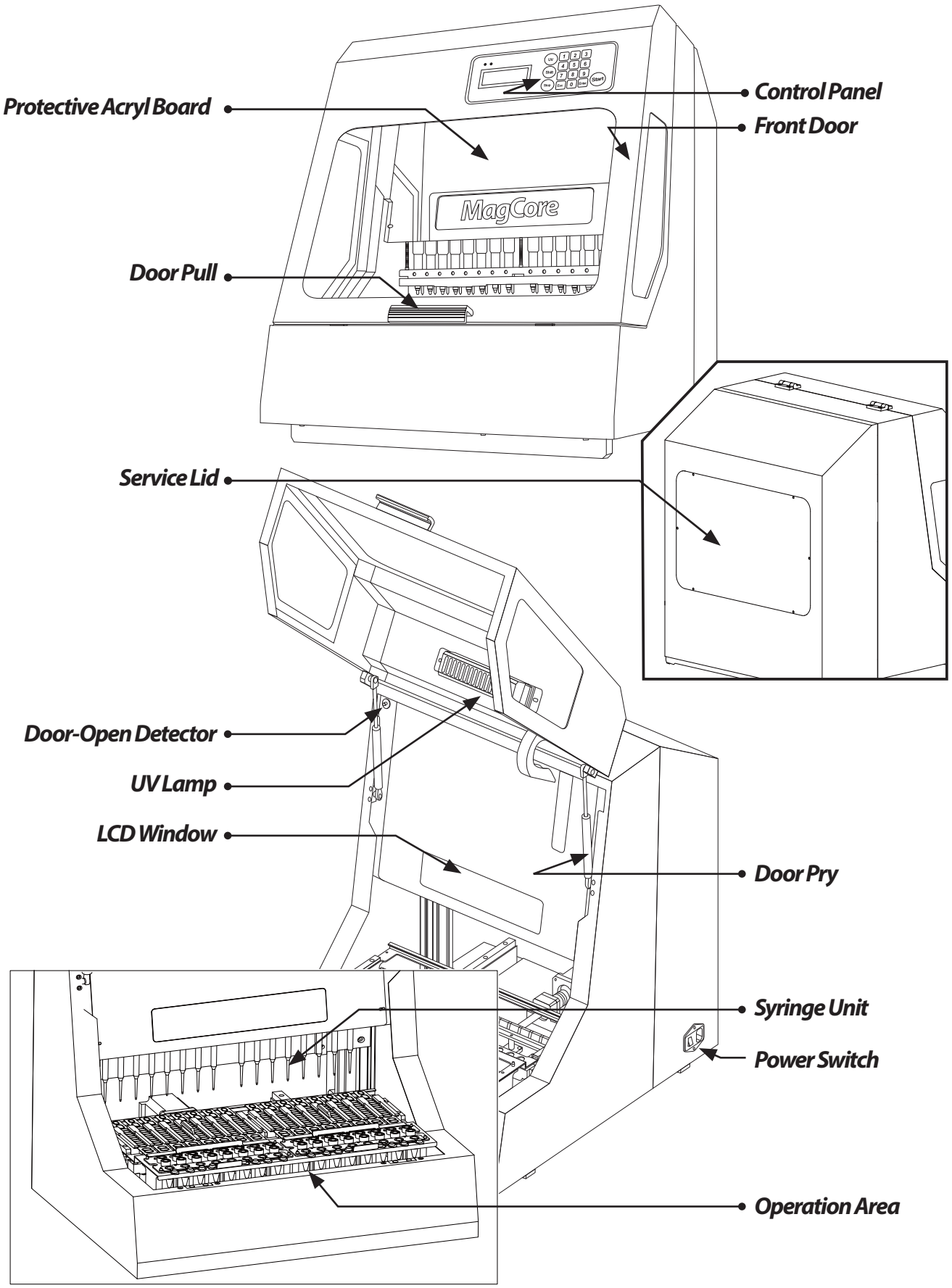
Installation

Before Install

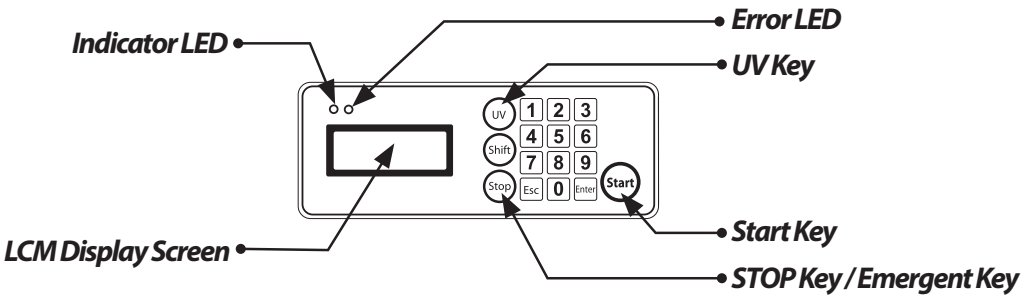


Before installation, please find a location of bench-top close to electrical outlets, and remain enough space for machine installation and ventilation.

HF-16 System Overview



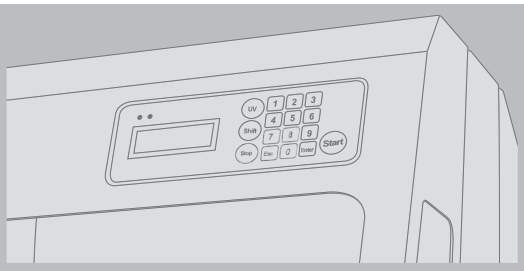
LCM Display Screen and Keypress Panel



MagCore® HF16 provides a touch button keypress panel for you to communicate with your instrument. The number keys give users to input Cartridge Code which specified on the Reagent Cartridge to run built-in program automatically, or to select desired volumes at start-up sample and final elution steps.

LCM Display Screen which with sapphire background light, shows clear information that the MagCore® HF16 is currently performing.

Special function of buttons described as:



UV

Perform UV sterilization after handling contagious specimens.

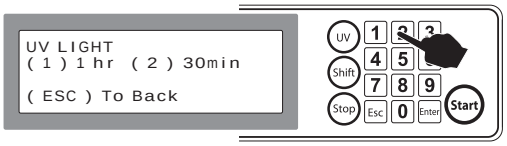
UV Sterilization

UV button is designed to turn on UV Lamp while your MagCore® HF16 needs to be sterilized after runing contagious samples.

Procedure

*Turn on power switch of MagCore® HF16, or after program completed and return back to "**Stand-By**" condition.*

*LCM display screen shows "**Stand-By**".*



Press UV button to proceed UV sterilization with 1hr / 30 mins of time options.
*Esc: Back to "**Stand-By**" menu.*

UV lamp actives and count down with selected time at minutes.

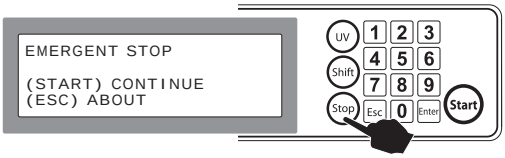
*MagCore® HF16 will go back to " **Stand-By**" menu once UV sterilization procedure completed.*

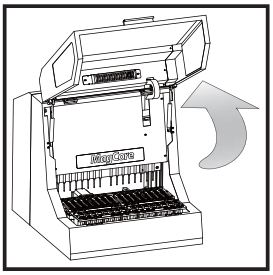
Emergent Stop

Stop

*Stop button is designed for going back to "Stand-By" menu at program completed, or for **EMERGENT STOP** use.*

In case of emergency, press "STOP" button at anytime. LCM display screen shows warning sign, Red Indicate LCD lights up and a beep sound can be heard.



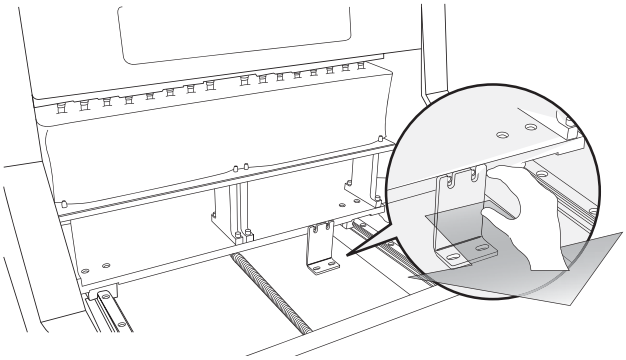


If the front door was opened during program running, MagCore® HF16 stops all mechanical movements immediately due to safty considerations.

Shift

*Shift button is designed for machine calibration **DO NOT** excute this program without trained engineer aside.*

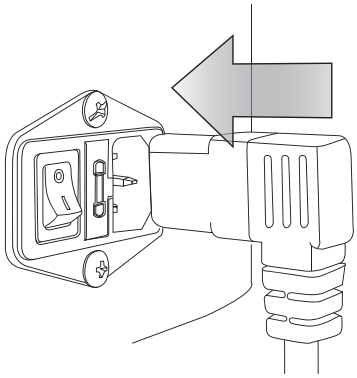
Install MagCore® HF16



Proceed installation procedures after placing MagCore® HF16 on a solid bench-top.

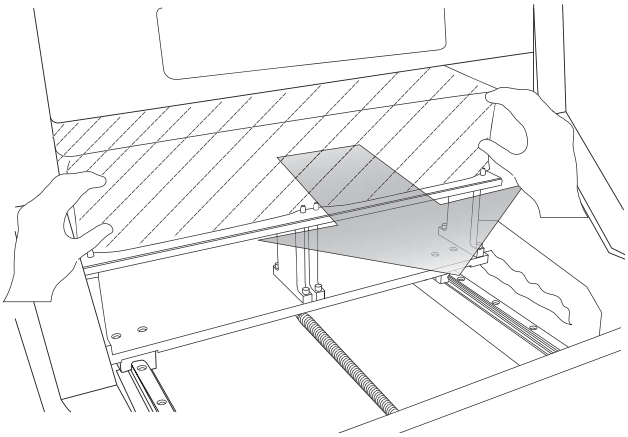
Open the front door and use philip screw driver to loose and take out the L-Block.

Please retain the L-Block and screws, to relocate for future move process or to fixed machine .



*Confirm the outlet voltage is **100v** to **240v** Keep hands dry and make sure that the machine remain switch-off while insert into the socket then turn on the power switch.*

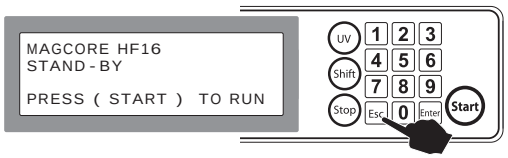
Connect power socket and turn on the power.



Remove bump buffer

*After power on, LCM shows "**STAND-BY**", then press Shift for FUNCTION menu*

Select (2) PISTION, machine will retreat bump buffer automatically.

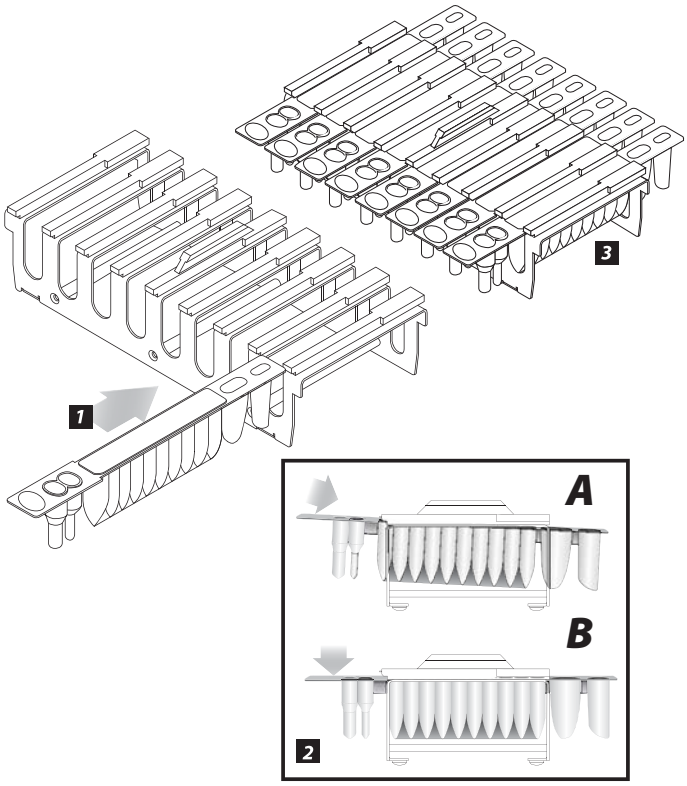


Press ECS twice to go back to STAND-BY menu. Complete instal procedures.

Repack bump buffer

1. *Plug in power cable, then turn on power switch.*
2. *Push back the plateform back (without T-rack and cartridge rack) to position where L-Block can be fixed.*
3. *Use Philip screw drive to fix 4 screws to L-Block.*
4. *Place the bump buffer on the cartridge plateform*
5. *Pull down the Syrindge plateform to secure bump buffer.*
6. *Turn off power.*

Insert Cartridge



1 *Insert MagCore® HF16 Viral Nucleic Acid cartridge into Cartridge Rack following arrow point directions.*

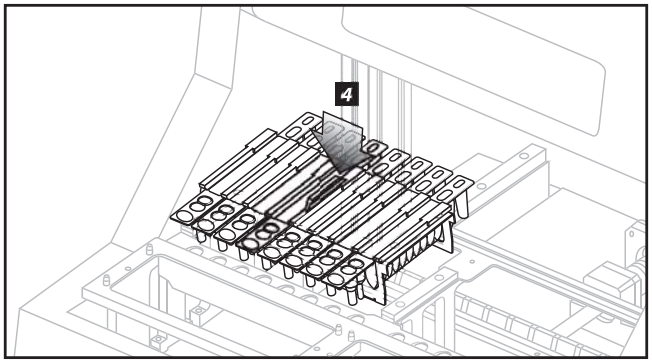
2 ***A.*** *Slide MagCore® HF16 cartridge into Cartridge Rack to the end with slight downward angle.*

B. *Press down the cartridge to interlock position under the over-hang part of Cartidge Rack. A click sound can be heard when it is locked correctly.*

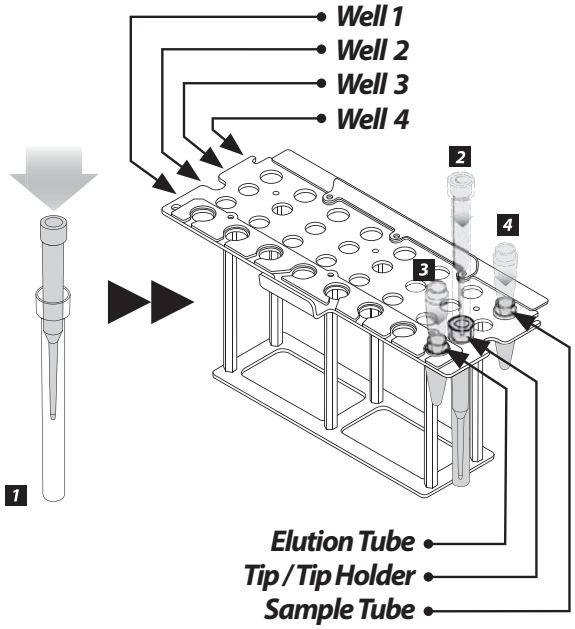
3 *Load as many cartridges as sample runs. Capacity for each*

4 *Cartridge Rack is 8, up to 16 samples for two Cartridge Racks can be performed at one time on MagCore® HF16.*

Instal the cartridges loaded Cartridge Rack into inner operation area of the MagCore® HF16 and lock firmly.



Setup Tube, Tip and Tip Holder



Please refer to MagCore® Kit User Menu for appropriate wells to setup Tip and Tube.

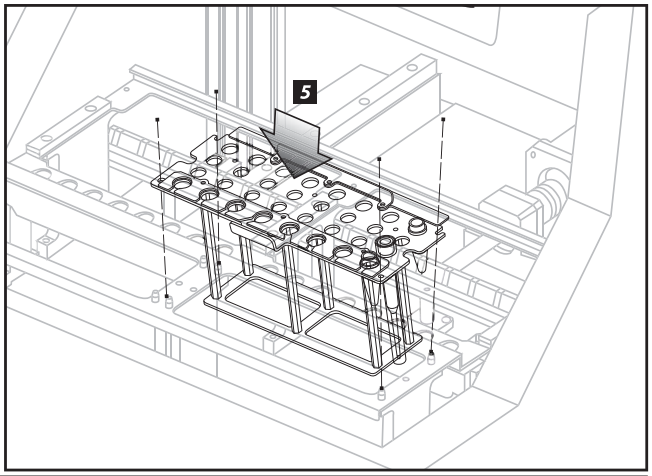
1 *Put Tips into Tip Holders.*

2 *Set the Tip/Tip Holder onto hole 2 of T-Rack.*

3 *Place provided Elution (Eppendorf) Tube or other types of tube into hole 1 of T-Rack as final purified DNA collection tube.*

4 *Set the Sample Tube onto hole 4 of T-Rack.*

5 *Instal the Tip/Holder and Sample/Elution Tubes loaded T-Rack into outter operation area of the MagCore® HF16 and lock firmly.*

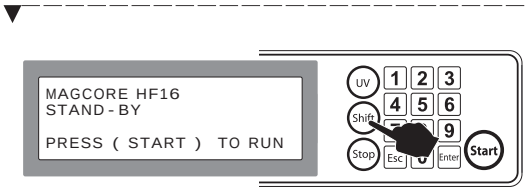


Caution:

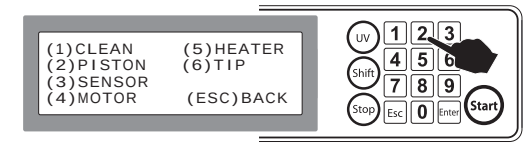
DO NOT use any other type of microcentrifuge tube to replace provided Sample Tube. It may cause operation impact due to different height of tubes.

System Test

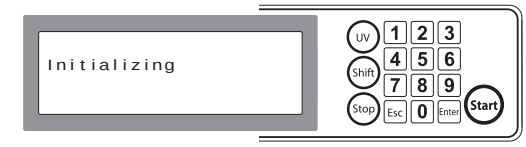
1. Apply 16 Tips / Tip Holders and Sample/Elution Tubes to T-Rack. Add 1ml of water to each Sample Tubes then close the front door.

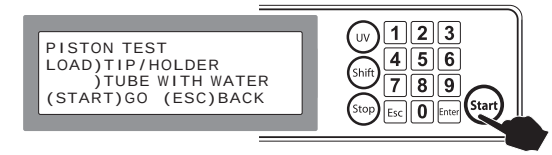


2. Press Shift to enter FUNCTION Menu.

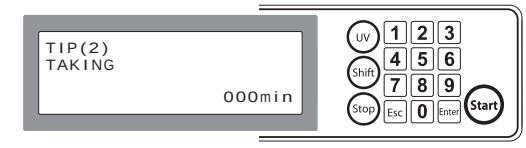


3. Select (2) PISTON for Tip taking and Syringe air-tight tests.

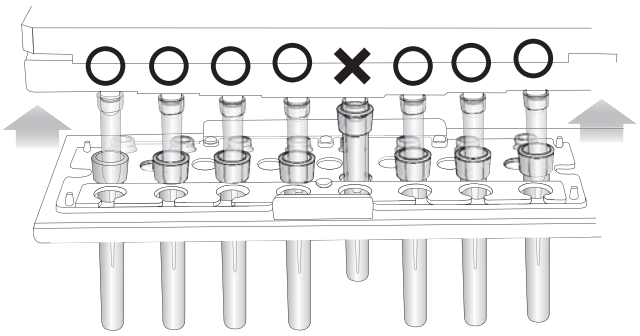




4. Press START to go.

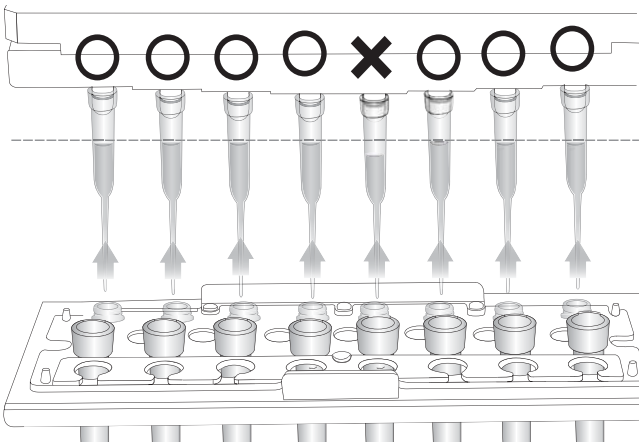


Test 1



Machine taking up Tips, please check whether the Tips move smoothly. If you observe a Tip Holder stuck, please press the STOP button immediately to stop and remove the jammed Holder. Replace the Tip/Tip Holder then run the procedure again. If the problem persists, contact your local dealer for engineering helps.

Test 2



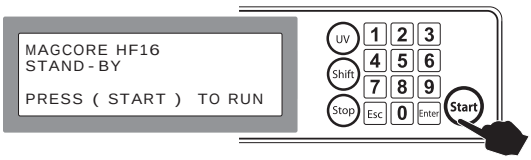
Tip will absorb water from Sample Tube and pause for 15 seconds, please check the liquid level of each columns are at same horizontal. If leakage situation is observed, press STOP button to stop and replcae the leaking Tip and O-ring, then run the test again. If the problem persists, contact your local dealer for engineering helps.

Test 3

Return Tip Please check whether it is smooth or not at returning Tips.

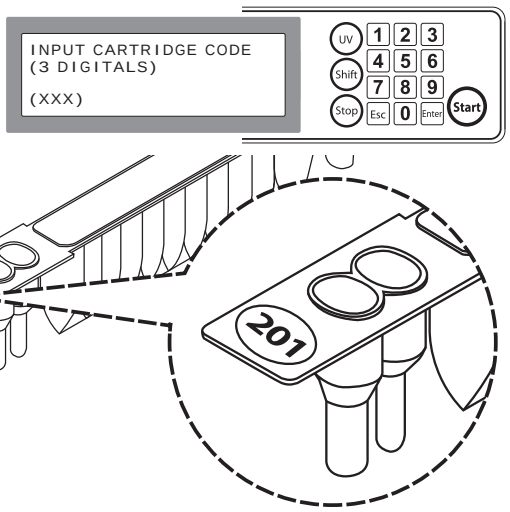
Start Programs

Install all necessary accessories and apply your specimen to MagCore®.



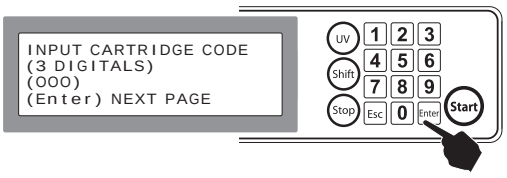
Press START

After press Start button, machine runs program of calibration, initialize to move all axis to original factory positions.

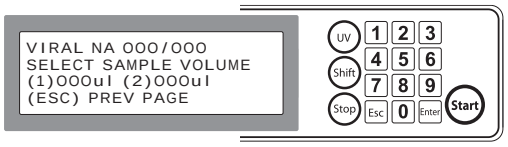


Input Cartridge Code to run protocol.
Cartridge Code is shown on your Reagent Cartridge and the cover of user manual.

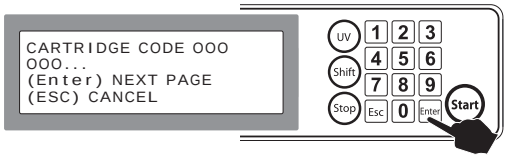
Above CODE is for demostration purpose, please refer to the kit you purchase for real workshop.



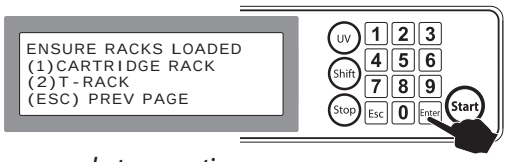
Confirm your input code again and press Enter to next page for sample volume selection.



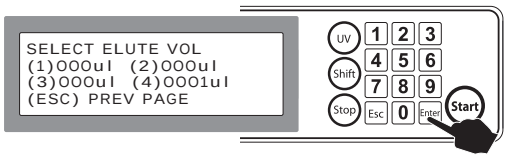
Select Sample Volume.



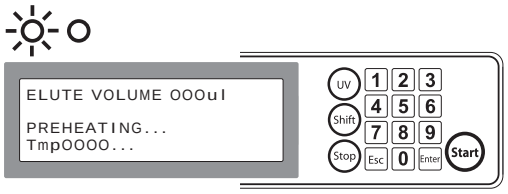
Confirm your input Sample Volume.
Press Enter for next page, Press ESC for back to Stand-By page.



At this step prepare racks to operation area.
After racks loaded then press Enter to next page for elution volume selection.

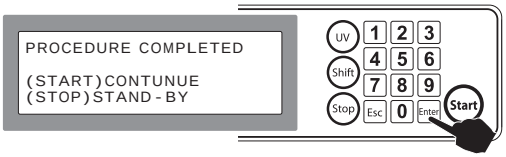


Select final elution volume.



MagCore® HF16 in process of selected protocol at this step. The Green Indicat LCD lights up and Heating Block starts to heat up to 65^{0}C for Lysis Step.

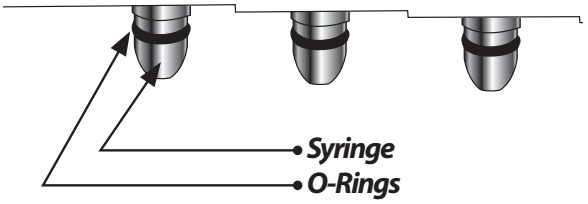
During MagCore® HF16 is under program running, the "MagCore" LCD lights up at all times.
DO NOT open the door at this moment, it causes emergent stop and you might lose your samples by machine interruption.



While program finished, a beep sound can be heard.
and green Indicate LCD light went out.

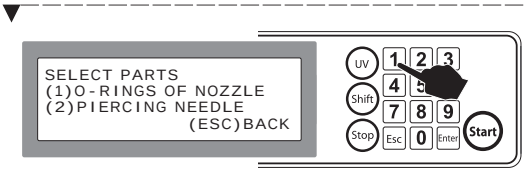
Easy Maintenance

Replace O-Rings

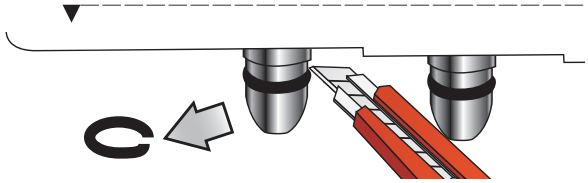


Under STAND-BY Menu, press Shift to enter FUNCTION menu.

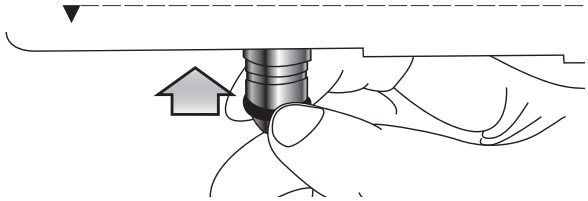
Select (1) CLEAN to enter next step.



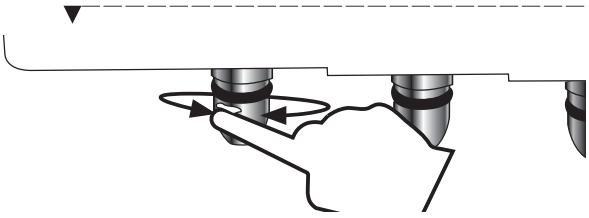
Select (1) for O-ring replcement.



Use a shap blade to cut off old O-ring,



Apply with new one,



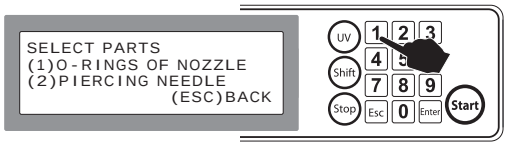
Use supplied lubricating oil to rub a thin layer around O-Rings , press ESC to back to STAND-BY menu and complete replacement.

Clean Piercing Needles

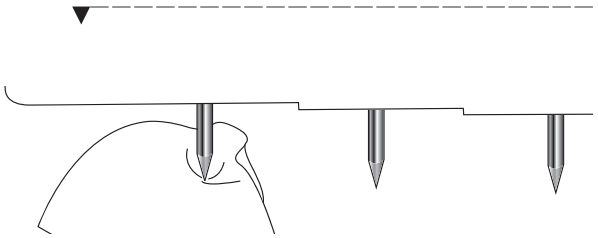
The Piercing Needles are very sharp, be careful for possible stabbing wounds to the hand.

Under STAND-BY Menu, press Shift to enter FUNCTION menu.

Select (1) CLEAN to enter next step.



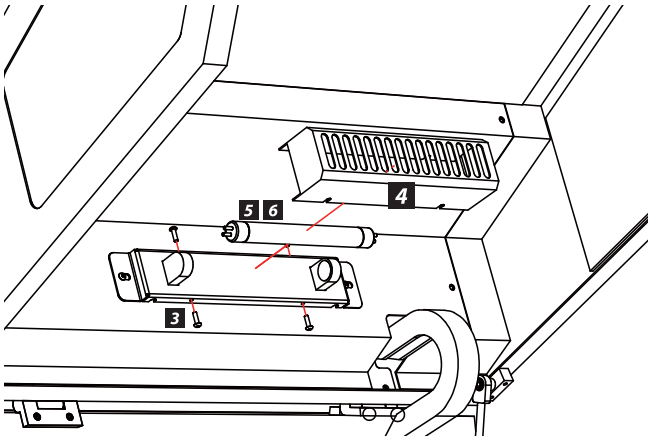
Select (2) for Piercing Needles clean up.



When Piercing Needles are positioned and stopped, use 70% alcohol with cotton paper to clean . Press ESC to go back to STAND-BY menu and complete cleaning procedures.

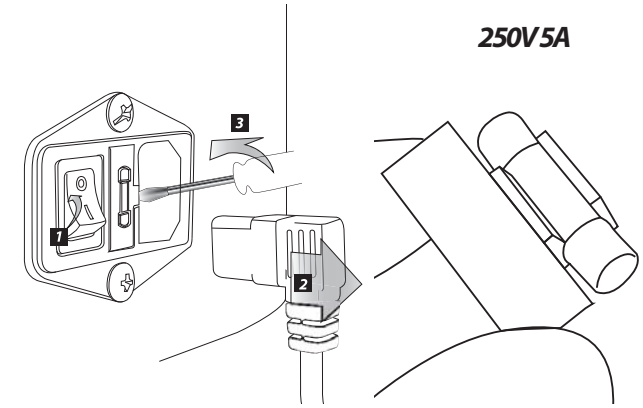
Machine is only allowed to clean with 70% alcohol. DO NOT use any type of organic solvents for cleaning.

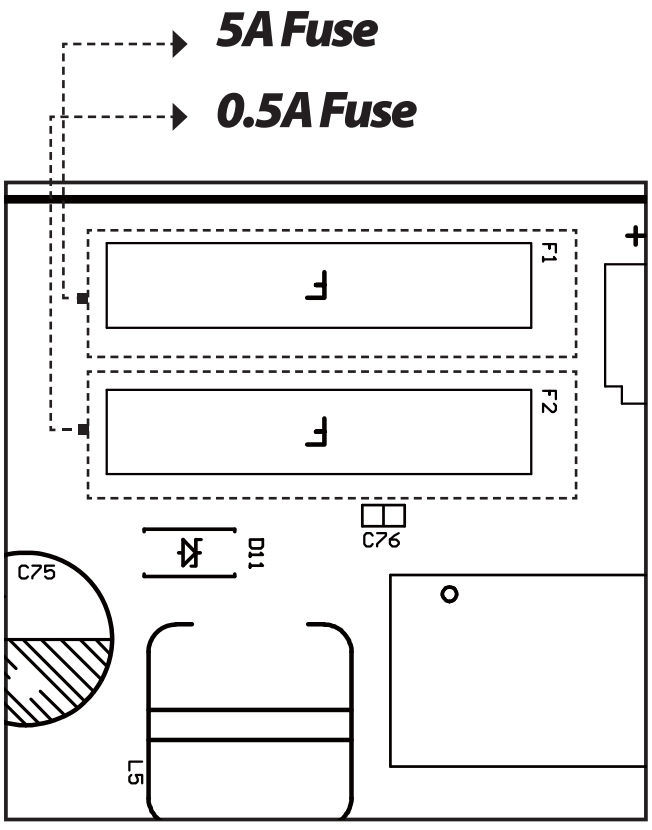
Replace UV Lamp



1. Turn off the HF16 System's power.
2. Open the HF16 System's Front Door.
3. Remove the four Fixing Screws on both sides of the UV Lamp Cover.
4. Remove the UV Lamp Cover with care not to damage the UV Lamp.
5. Remove the UV Lamp from the UV Lamp Bracket.
6. Replace the UV Lamp Cover and the four Fixing Screws.

Replace Fuse





> Only use specified fuse for replacement, using higher amper fuse will cause server danger of burning.

Replace Fuses (inside Power Inlet)

Equipment

Flathead screwdriver

Procedure

1. Remove the Fuse Holder using a flathead screwdriver.
2. Replace the Fuse when broken with a new fuse according
3. to the specification written on the Power Inlet (***5A***).

Replace Fuses (CPU Board)

> Turn off the power and remove power socket before opening the Service Lid. Touch internal parts may cause electric shock hazards.

> Take electrostatic protective measures while you need to toch the CPU board.

Procedure

1. Removing Service Lid
2. Replace a Fuse(s) when broken with a new fuse according to the specification written on the board .

Each fuse is placed in the circuit as follows:

F1: ***5A*** CPU Board, Power Indicator, Four Axes Pulse Motor Driver Board

F2: ***0.5A*** Four Axes Pulse Motor Driver Board (Excitation ON/OFF)

Trouble Shooting Guide

Problem	Possible Cause	Recommendation
Drops of liquid on the Cartridge rack or the T-rack	Leakage of the tips due to damaged or worn O-rings in piston.	Please refer to the System Test, and check the liquid level of each columns are at same horizontal.
Pipetting of wrong liquid volumes	1. Head of tip might be bent. 2. Worn piston O-rings 3. Reagents were stored too long.	1. Check the Tip head. 2. Please refer to the System Test, and check the liquid level of each columns are at same horizontal.
Liquid level up to tip fillte	1. Wrong sample meterials 2. Wrong sample tubes.	1. Please refer to the MagCore® kit manual. 2. Please use provided sample tubes.
No piercing	V motor or connector is not working properly.	Restart system. If problem persists, contact Technical Service.
LCM panel disappeared	PCB board or connector is not working properly	Contact Technical Service.
Axis no movement	Motor or connector is not working properly.	Restart system. If problem persists, contact Technical Service.
Tip Holder jammed	1. The holder might be bent. 2. Nozzle Heads is not correctly position.	1. Press the STOP button immediately, and replacing the new Tip and Holder. 2. Contact Technical Service.

MagCore®

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