















Magnetic Rotary Mixer  
*Maelstrom 8-channel Handler*

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## About This Manual

The label on the instrument, the User manual, and other packaging material may contain the following symbols:

	Catalog number
	Serial number
	Specification of fuse
	Manufacturer
	The date of manufacture
	This product fulfills the requirements of the European Directive
	In Vitro Diagnostic Medical Device
	Consult Instructions for Use
	Authorized Representative in the European Community
	Caution, consult accompanying documents
	Hot surface, contact with skin may cause burns
	Watch your fingers and your hands

# 1 Introduction

Maelstrom 8-channel Handler (the M8-H) is a magnetic bead handling equipment with high speed stirring function, which can spin up to 3000 rpm. With eight 2500 gauss magnetic rods, intuitive interface and simple operation, the M8-H can accomplish any application of magnetics beads.

**Please read this manual carefully before usage.**

NOTE: Low battery level of the M8-H might cause the interruption of experiments.



## Specifications

Model:	Maelstrom 8-channel Handler
Weight:	600 g
Dimensions:	32.7 x 11.2 x 6.3 cm
Power:	5 V, 2 A
Battery:	3.7 V, 2850 mAh
Capacity:	8 samples per run
Process	50 $\mu$ l – 1500 $\mu$ l
Spin speed:	500 - 3000 rpm
Magnetic	DIA: 2.0mm, 2500 gauss
Display:	2.4" LCD, 240 x 320 pixel

## **Operation Principle**

The M8-H equips eight magnetic rods which can collect and transfer magnetic beads from one well to another. With the spin tips, suspensions can be mixed by the M8-H with the adjustable spin speed which is up to 3000 rpm. Purified nucleic acids can be obtained after the steps of lysis, wash and elute.

### **Intended Use:**

- The M8-H can be used with the TANBead Nucleic Acid Extraction System Maelstrom 8 Autostage (the M8-H Autostage). This model offers a fully automated nucleic acid platform.
- The M8-H can be used in combination with TANBead Nucleic Acid Extraction Kit to extract DNA/RNA from specimen.
- The M8-H can handle magnetic beads for purification of nucleic acid.

## **Safety and EMC Information:**

### **Safety Requirements**

- The medical device has passed the tests and conformed to the standards of IEC 61010-1:2010, "Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements".
- The medical device has passed the tests and conformed to the standards of IEC 61010-2-101:2015, "Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-101: Particular requirements for in vitro diagnostic (IVD) medical equipment".

### **EMC Requirements**

- The medical device has passed the tests and conformed to the standards of IEC 61326-1:2012 & IEC 61326-2-6:2012, "Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-6: Particular requirements - In vitro diagnostic (IVD) medical equipment".
- The medical device has passed the tests and conformed to following standards:  
EN 61326-1:2013  
EN 61326-2-6:2013  
EN 61000  
EN 62304:2015  
IEC 62366-1:2015-02

## 2 Equipment List



**M8-H**



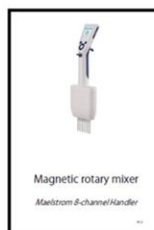
**Transformer**



**Adaptor plug**  
(Vary by country)

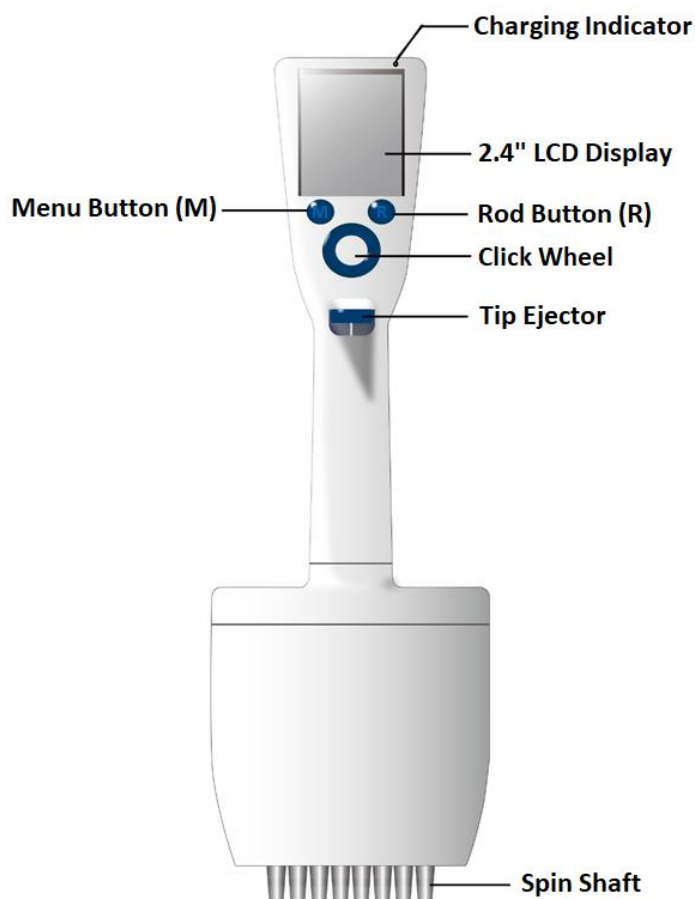


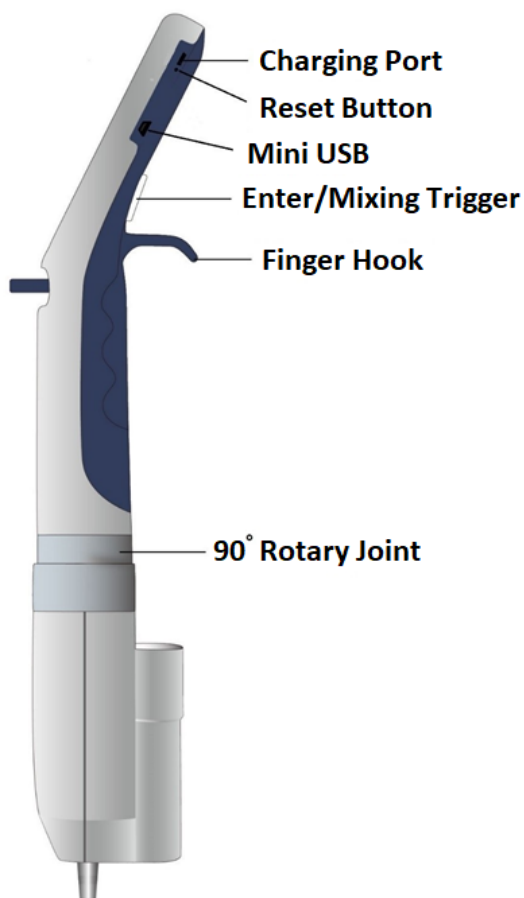
**Sample spin tips**  
(8 pcs)



**Manual**

### 3 Overview







## 4 Environmental Requirements

- Operation condition:  
Temperature: 4-40°C  
Humidity: 40-80%
- Storage and transportation condition:  
Temperature: 8-40°C  
Humidity: 0-85%
- Maximum operating altitude: 2000 m
- To avoid shortening of the lifespan of the instrument, use the M8-H in a location that meets the following criteria:  
Choose a location that has good air circulation.  
Do not use the M8-H in a location with large temperature variability or high humidity.

## 5 Safety Instructions and Guidelines

- This device can be used with potentially biohazardous materials. Use appropriate personal protective equipment (gloves, safety goggles, lab coat, etc.) for handling and disposing of biohazardous materials.
- Under normal condition, sound pressure level from the M8-H does not exceed 80 dBa otherwise, it might cause a hazard. Please contact technical support in case of higher sound pressure level.
- This device can be hazardous due to the use of chemical and biohazardous substances.
- Users should adhere to their institutional guidelines for the handling and disposal of all infectious substances used with this device.
- It is important to clean the device after every use. If samples or reagents have been spilled, it is required to clean the instrument immediately to avoid damage or contamination of samples.
- This device is designed to use with the compatible spin tips. Using incompatible spin tips may cause poor extraction performance.
- Read this user manual thoroughly prior to operating the device. Failure to read, understand, and follow the instructions in the manual may result in damage to the device, injury to laboratory and operating personnel or reach the poor performance. TANBead and its agents are not responsible for the consequences caused by the reasons above.

## 6 Before Usage

Before first use, charge the M8-H to unlock shipping mode.

Before each use, please mount the spin tips to the M8-H.

1. Assemble the adaptor plug to the transformer. (Fig.1 and Fig.2)
2. Insert the Micro USB of transformer into the charging port of the M8-H. (Fig.3)
3. The M8-H will be turned on automatically without pressing any button. This indicates the M8-H has been unlock from shipping mode.

NOTE: The automatic turn on only happens at first charging.

4. When the M8-H is plugged into charging port, the charging indicator on the screen will turn orange. (Fig.4) After the M8-H is fully charged, it will be off.
5. Under normal circumstance, 25°C/75°F and 1 atm, battery takes 1.5 hours for a full charge.
6. The battery level and the requiring time for a full charge may vary under different circumstances.
7. The battery level will decrease slowly even when the M8-H is not being used.
8. **Do not disassemble the M8-H.**
9. For assistance, please contact your local distributor or manufacturer (TANBead).

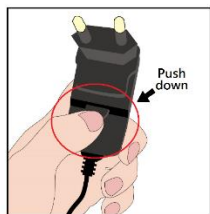


Fig.1

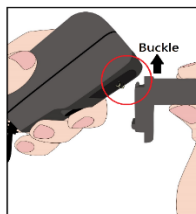


Fig.2



Fig.3

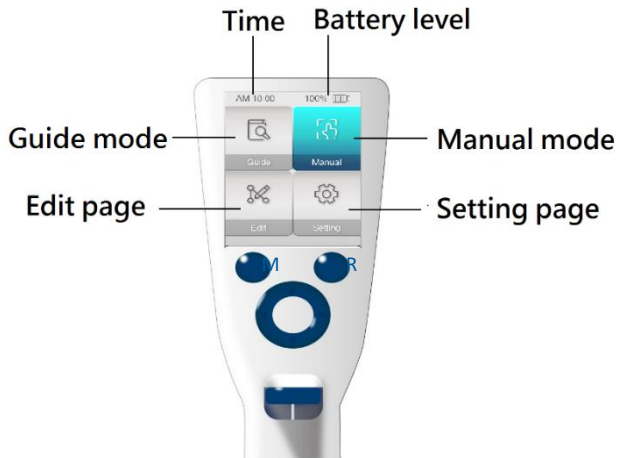


Fig.4

## 7 Switch on or off

Press menu button to switch on the M8-H.

To turn off, press menu button for 3 seconds.



**ON**

**Press menu button (M)**

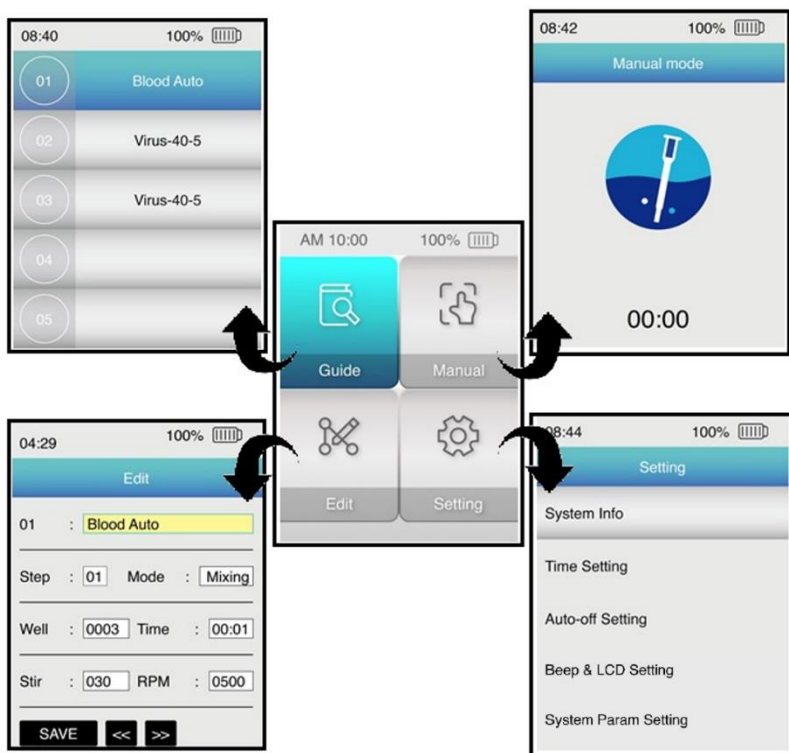


**OFF**

**Press menu button (M)  
for 3 seconds**

## 8 Main Page

From Main page, user can choose to operate the M8-H in Guide mode or Manual mode. To pre-set or edit program, please enter edit page. To set up system beep sound, auto-off, time and date, please enter the setting page. Further system information can be found in setting page.



## 9 Functional Keys

### Menu Button

1. Press menu button to turn on the M8-H. To turn it off, press the menu button for 3 seconds.
2. User can return to main page without saving changes by pressing menu button twice.
3. In Guide mode, user can exit program by pressing menu button twice.



**ON**  
Press menu button (M)



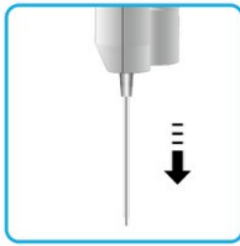
**OFF**  
Press menu button (M)  
for 3 seconds



**RETURN**  
Press twice

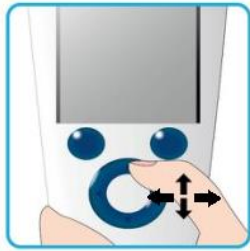
### Rod Button

1. In manual mode, press rod button to extend the magnetic rods. To withdraw the magnetic rod, just press the rod button again.
2. In edit page, user can change the input method by pressing rod button (R).



### The Click Wheel

1. In manual mode, use up or down key to increase or reduce the spin speed. Use left or right key to change the spin direction.
2. In Edit page, use left and right keys to move to each factor. Use up and down keys to adjust the factor.
3. In setting page, use up and down keys to move cursor. Press enter/mixing trigger to select.



### The Enter/Mixing Trigger

1. Press enter/mixing trigger to activate the enter function.
2. In guide mode, press enter/mixing trigger to start the chosen program.
3. During the processing program, press enter/mixing trigger to pause the step.
4. In manual mode, press enter/mixing trigger to start mixing.
5. In Edit page, press enter/mixing trigger to confirm the parameters. After editing, move the cursor to save button by the click wheel, and press enter/mixing trigger to save the change.

# 10 Guide Mode

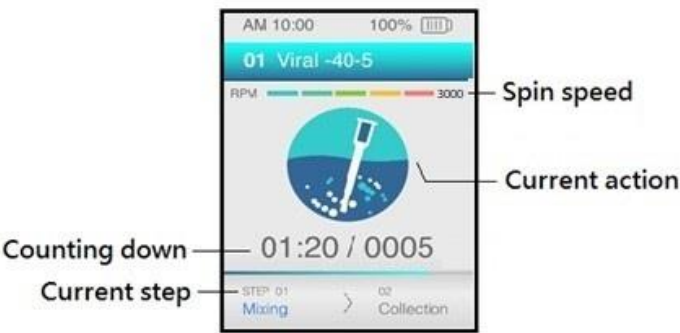
Follow the instructions on the screen, and press enter/mixing trigger to proceed.



There are pre-installed programs in the M8-H. Use click wheel and enter/mixing trigger to select.

## About editing the program

Please refer to the instructions of edit page for further editing.



Mixing



Collection



Vapor



Pause



Finish



### Mixing

Mount the spin tips to the M8-H, press enter/mixing trigger to start mixing. Press enter/mixing trigger again to stop mixing.



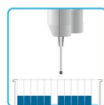
### Collection

When mixing stopped, raise the M8-H off the wells, and press rod button to extend magnetic rods. After the rods are completely extended, slowly insert the M8-H with the spin tips into the well. The beads will be collected on to the spin tips.



### Vapor

After the beads in well are complete collected on the spin tips, raise the M8-H off the wells and sit the beads in the air for vaporing.



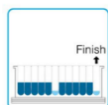
### Pause

When the M8-H is connected with the M8-H Autostage, user can include a pause step based on experimental workflow. During the pause step, a program paused message will be shown on the screen and the M8-H starts beeping to remind user.



### Finish

When all steps of the program are completed, a finish message will be appeared on the screen.





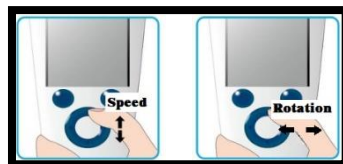
## 11 Manual Mode

User can perform each operation separately in manual mode.

### Mixing

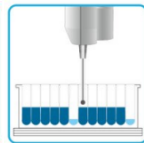
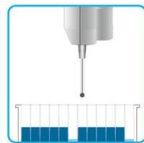
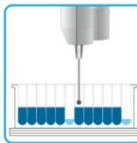


1. Mount the spin tips to the M8-H.
2. Insert the M8-H to the bottom of wells and press enter/mixing trigger to start mixing.
3. Press enter/mixing trigger to stop mixing.
4. Use up or down keys to accelerate or decelerate of spin speed.
5. When the spinning is stopped, use left and right keys to change the spin direction.



### Collection

1. When mixing stopped, raise the M8-H off the wells and press rod button to extend magnetic rods.
2. After the rods are completely extended, slowly insert the M8-H into the wells. The beads will be collected on the spin tips.
3. Raise the M8-H off the wells, slowly place the M8-H with beads collected on the spin tips into the target wells.
4. Submerge the spin tips with collected beads in solution and press rod button again to withdraw the magnetic rod. The beads will be released in the target wells.



## 12 Edit Page

User can edit, copy, rename or delete programs in edit page. In the absence of the M8-H Autostage, the program serves as a guide to lead user through the operation in guide mode.

NOTE: The status of “Stand Connection” should be set as “Disable” (The path of Stand Connection: Setting → System Param Setting → Stand Connection).

With the M8-H Autostage, the program acts as an automation script to coordinate the M8-H and the M8-H Autostage.

NOTE: The status of “Stand Connection” should be set as “Enable” when the M8-H connects with the M8-H Autostage.

### To edit the protocol on the M8-H



Select the target program. User can edit, delete or copy the program.

Program number:

- User can store maximum 50 programs (01-50).

Well capacity:

The volume of solution in the well.

- Input value: from 50 to 1500 ( $\mu$ l).
- The moving range of the spin tips will be optimized based on this volume.



Temperature:

Temperature in centigrade.

- Range: from 20 to 70 ( $^{\circ}$ C)
- Enable: select for setting same temperature for all steps.

NOTE 1: These two switches are acting as “Select All” function, user can set the same temperature for each step by using these two switches.

NOTE 2: These two switches will be cleared every time after program finish, but the temperature which was set last time, will be remained in each step.

Program name:

- Maximum 14 characters.
- Press rod button (R) to switch between input keys (abc, ABC, 123, @, DEL, INS)
- abc: a-z
- ABC: A-Z
- 123: 0-9
- @: - ( )
- DEL: press enter/mixing trigger to delete a character
- INS: press enter/mixing trigger to insert a character

The screenshot shows a handheld device screen with a status bar at the top displaying '04:29' and '100%' battery. The screen title is 'Edit'. Below the title, there is a list of steps, with the first step '01' selected and labeled 'Blood Auto'. The configuration for step 01 is as follows:

Step	: 01	Mode	: Mixing
Well	: 0003	Time	: 00:01
Stir	: 030	RPM	: 0500
Temperature	: 030	Enable	: <input checked="" type="checkbox"/>

At the bottom of the screen, there are three buttons: 'SAVE', '<<', and '>>'.

Step:

- User can configure maximum 40 steps in a program.
- Please refer to the manuals of the reagents for detailed operation description.

Well:

- User can choose a well to set the specific action.
- When it is connected with the M8-H Autostage, the M8-H can process maximum 12 columns of wells.

Mode:

Performable actions

- Mixing (define Well, Time, Stir, RPM, Temperature, Enable parameters)
- Collection (define Well, Time, Temperature, Enable parameters)
- Vapor (define Well, Time, Temperature, Enable parameters)
- Pause (define Temperature, Enable parameters)
- End

RPM:

The speed of spin

- Input value from 500 to 3000.
- It is recommended to set the spinning speed at least 3000 rpm for the efficient mixing.

Time:

Operation time of each action

- Format: Minutes: Seconds (Minute: 00-59, Second: 00-59)

Stir:

Frequency of rotation change.

- Input value from 0-990.
- Number "20" means the spin direction changes every 20 seconds.

Procedure:

1. Press enter/mixing trigger to select the target program
2. In Cap. & Temp. Edit page, user can change the volume of each well and set a temperature for whole program by entering a value and ticking in enable box.
3. Press up key to start editing the details of each step.
4. Press enter/mixing trigger at name field, you can rename the program.
5. Press rod button to switch input keys, and press enter/mixing trigger to enter.
6. Use left and right keys of click wheel to move the cursor.
7. Use up and down keys of click wheel to adjust the factor.
8. Set the step at Step field.
9. Set the action at Mode field.
10. Set the target well at Well field.
11. Set the period of the step at Time field.
12. Set the temperature value at Temperature field, please tick in the enable box for temperature control.
13. Stir field indicates the frequency of rotation change. Number "20" means the spin direction will change every 20 seconds.
14. Adjust the mixing speed at RPM field.
15. Move the cursor to save button and press enter/mixing trigger to save the change.

NOTE: The temperature control only functions when the M8-H connects to the M8-H Autostage

## To edit the protocols in your computer

User can edit the protocols in an Excel file.

Procedure:

1. Connect the M8-H with a computer by using transmission cable.
2. The program files ("01.csv") are located in the folder of the M8-H.
3. Open the program file in Excel.
4. Edit and save the file in CSV format.

NOTE: To create a new program, copy and paste one of the files and rename it in numbers (1-50).

## The Layout of programming protocols in an Excel file

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	DEMO												
2		Well:1	Well:2	Well:3	Well:4	Well:5	Well:6	Well:7	Well:8	Well:9	Well:10	Well:11	Well:12
3	Well capacity	100	200	300	400	800	1000	1500	50	100	200	300	400
	Step	Well	Action (C:Collection/ M:Mixing/V:V apor/P:Pause)	RPM	Time (Second)	CW/CCW (Second)	Temperature	Temperature _Control					
4													
5	1	4	M	3000	60	10	45	YES					
6	2	4	C	0	30	0	35	YES					
7	3	1	M	3000	30	200	70	YES					
8	4	1	C	0	30	0	65	YES					
9	5	2	M	3000	300	800	45	YES					
10	6	2	C	0	30	0	45	YES					
11	7	3	M	3000	30	0	45	YES					
12	8	3	C	0	30	0	45	YES					
13	9	4	M	3000	30	0	45	YES					
14	10	4	C	0	30	0	45	YES					
15	11	5	P	0	0	0	45	YES					
16	12	5	M	3000	30	0	45	NO					
17	13	5	C	0	30	0	45	NO					
18	14	5	V	0	600	0	45	NO					
19	15	6	M	3000	30	0	45	NO					

Program name:

- The program name is stored in A1 field of the spreadsheet.
- Maximum 14 characters

Well capacity:

The volume in the well.

- Input value from 50-1500 ( $\mu$ ).
- The moving range of the spin tips will be optimized based on this volume.

NOTE: **Must** input value for each well.

Step:

- User can set maximum 40 steps in one program.
- Please refer to the manuals of the reagents for detailed operation descriptions.

Well:

- User can choose a well to set the specific action.
- When it is connected with the M8-H Autostage, the M8-H can process maximum 12 columns of wells.

Mode:

Performable actions.

- C: Collecting
- M: Mixing
- V: Vaporizing
- P: Pause

RPM:

The speed of spin

- Input value from 500 to 3000 rpm
- It recommended to set the spinning speed at least 3000 rpm for the efficient mixing.

Time (second):

Operation time of each action

- 3599 is the maximum value

CW/CCW (second):

Frequency of rotation change.

- Input value from 0-990.
- Number "20" means the spin direction will change every 20 seconds.
- Equivalent to the stir field in the M8-H edit page.

Temperature (Celsius):

Temperature in centigrade

- Range: From 20 to 70 degrees.
- Increase/decrease in increments of 5 degrees.

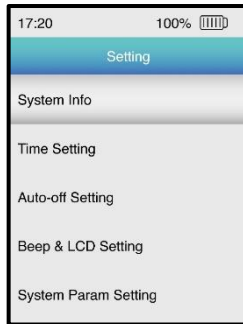
Temperature Control:

- Press Yes: Input the value in the temperature field and tick in the enable box.
- Press No: Temperature control is not activated.

NOTE: If this field remains empty, the control function is invalid.

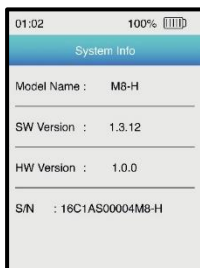
## 13 Setting Page

User can obtain the system information and adjust parameters in setting page.



### System Info

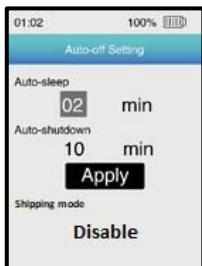
This page shows the version of hardware and software and S/N number of the M8-H. If the detailed setting information before shipping is needed, please contact manufacturer.



### Time Setting

User can use left and right keys of click wheel to move the cursor, and use up and down keys of click wheel to adjust the time and date. Click on Apply button to save the setting.

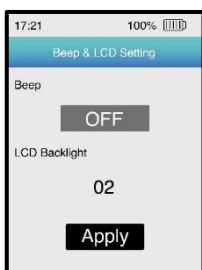




### Auto-off Setting

User can use left and right keys of click wheel to move the cursor and use up and down keys of click wheel to adjust the time of Auto-sleep and Auto-shutdown. Click on Apply button to save the setting.

NOTE: Shipping mode is used to protect the M8-H during transportation. We do not recommend user to change this setting without the authorization by manufacturer.



### Beep & LCD Setting


User can use left and right keys of click wheel to move the cursor and use up and down keys of click wheel to switch on or off of the beep sound and adjust LCD backlight. Click on Apply button to save the setting.



### System Param Setting

User can use left and right keys of click wheel to move the cursor.

NOTE 1: About Stand Connection

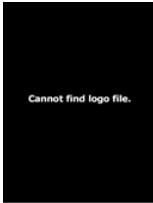



Please remain the connection **DISABLE** when user operates the M8-H Individually. Please change the connection to **ENABLE** when the M8-H is connected to the M8-H Autostage. The connection symbol (  ) will be shown on the screen.






NOTE 2: About Rod offset

This value was set by manufacturer (TANBead) before shipping. This value affects the performance of nucleic acid extraction. We DO NOT recommend user to change this value without authorization. TANBead and our distributors are not responsible for any consequences if the value was been changed by users.



## 14 Error Messages

No.	Description	Error messages			Solution
		Display	LED	Alarm	
1	System image file is not found during booting.		No	No	1. Reboot. 2. If it happens again, please contact technical support.
2	Uncharged, battery power remains less than 10%		Red	Yes	Please charge the M8-H with cable or mini USB.
3	In the boot state, the voltage is less than 2V when the M8-H is charging.		Yellow	No	Please contact technical support.
4	In the boot state, the battery temperature is higher than 45°C.		No	No	If the battery temperature is too high, please stop using the M8-H for 10 minutes. If this error happens again, please contact technical support.

No.	Description	Error messages			Solution
		Display	LED	Alarm	
5	Motor module is not detected.		No	No	1. Reboot. 2. If it happens again, please contact technical support.
6	DC motor is blocked.		No	No	1. Reboot. 2. If it happens again, please contact technical support.
7	Step motor is over current.		No	No	1. Reboot. 2. If it happens again, please contact technical support.
8	Limit sensor is not responding.	During booting:  After booting: 	No	No	1. Reboot. 2. If it happens again, please contact technical support.

## 15 Cleaning and Maintenance

- It is important to clean the device after every use. If samples or reagents have been spilled, it is required to clean the device immediately to avoid damage or contamination of samples.
- Wear gloves and appropriate personal protective equipment. If the device is used with biohazardous materials, dispose of any cleaning materials used in accordance with your institutional guidelines.
- The device may go through a run with the magnetic rods unprotected. If this happens, the magnetic rod needs to be cleaned.
- To clean the magnetic rods, wipe with a soft cloth dampened with 70% ethanol.
- If the magnetic rods cannot be cleaned, please contact your local distributor or manufacturer (TANBead) for technical assistance.

## 16 Disposal

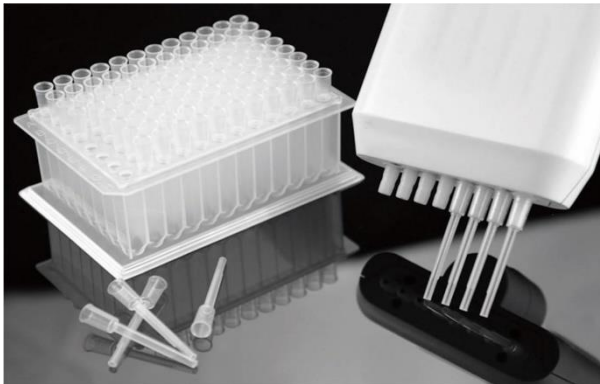
In case the product is to be disposed of, the relevant legal regulations are to be observed. As disposal regulations may differ from country to country, please contact your supplier if necessary. Please follow your institutional and country-specific requirements to handle the disposal of accessories. Device must be decontaminated prior to disposal.

- The device contains Li-ion battery. Do not dispose of batteries as household waste.
- Dispose of batteries according to the locally applicable legal regulation.

## 17 Patents

### Patents

USA:	US09616398B2
EU:	EP2937136
Canada:	CA2862946
Japan:	JP6151735
Korea:	10-1696517
WIPO:	WO2016127292
China:	CN104971638B
Taiwan:	I526245



# 18 Accessories

## TANBead Nucleic Acid Extraction System Maelstrom 8 Autostage (non-sterile)

### Introduction

TANBead Nucleic Acid Extraction System Maelstrom 8 Autostage (the M8-H Autostage) provides an efficient and comfortable operating platform for the Maelstrom 8-channel Handler (the M8-H). The M8-H Autostage is a firm stand and a precise arm for the M8-H operations. The M8-H Autostage provides a walk-away solution for the M8-H. With this automated platform, all extraction functions for handling magnetic beads are comprehensively coordinated, including mixing, collection, transfer of beads, vapor and pause procedures.

### Magnetic Rotary Mixer

TANBead Nucleic Acid Extraction System Maelstrom 8 Autostage (non-sterile) connected with Maelstrom 8-channel Handler (non-sterile)



### Specifications

Model:	M8-H Autostage
Weight:	833 g
Dimensions:	31 x 19 x 31 cm
Power	19 V, 2 A, 120W
Capacity:	8 samples per run when paired with the M8-H
Heater:	1 heated plate(maximum: 70°C)

## 19 Appendix

TANBead Nucleic Acid Extraction System Maelstrom 8 Autostage (non-sterile)

### 19.1 Intended Use:

- The M8-H Autostage can be used in combination with the Maelstrom 8 and TANBead's Nucleic Acid Extraction Kits to extract DNA/RNA from samples.
- The M8-H Autostage can hold the Maelstrom 8 for a stable, precise, and automated operation.

Safety and EMC Information:




Safety Requirements

- The medical device has passed the tests and conformed to the standards of EN 61010-1: 2001, "Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements".
- The medical device has passed the tests and conformed to the standards of EN 61010-2-101: 2002 "Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-101: Particular requirements for in vitro diagnostic (IVD) medical equipment".

EMC Requirements

- The medical device has passed the tests and conformed to the standards of IEC 61326-1:2012 & IEC 61236-2-6:2012, "Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-6: Particular requirements - In vitro diagnostic (IVD) medical equipment".
- The medical device has passed the tests and conformed to following standards:  
EN 61326-1: 2013  
EN 61326-2-6:2013  
IEC 61000  
EN 55011:2016

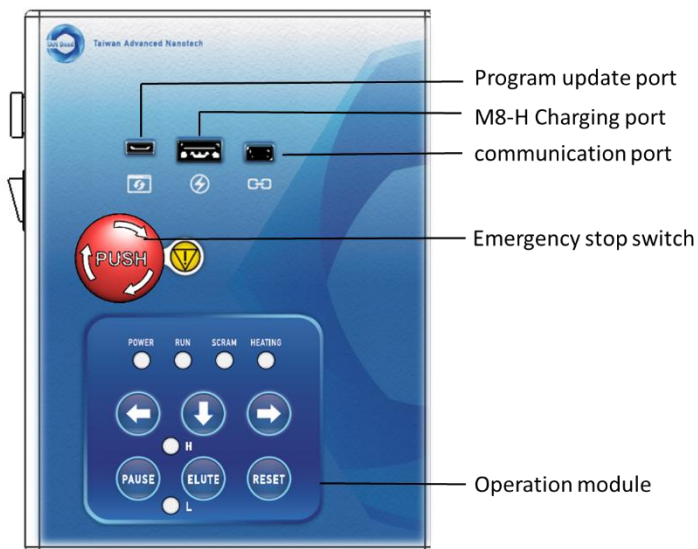
## 19.2 Equipment List

<p>1. M8-H Autostage</p>	 A black, boxy electronic device with a blue top panel featuring several buttons and a small display. It has a front-loading slot and a base with a yellow arrow pointing to a specific location.
<p>2. Power cord &amp; Adapter (19 V / 6.32A / 120W)</p>	 A black power adapter with a label on its top surface. It has a standard three-prong AC power cord on one side and a DC power cable with a custom connector on the other.
<p>3. Transmission cable</p>	 A black cable with two different connectors at each end, one of which appears to be a USB or similar standard connector, and the other is a custom connector.

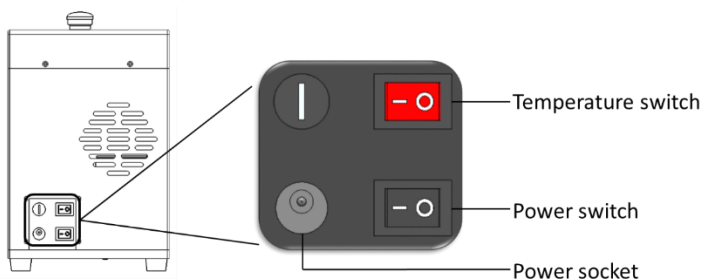
NOTE: The function of the transmission cable combines with charging for the M8-H and software communication between the M8-H and the M8-H Autostage.

### 19.3 Overview

- Main operation interface



- Power input





## **19.4 Environmental Requirements**

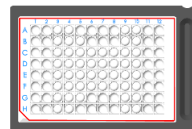
- Operation condition:  
Temperature: 4-40°C  
Humidity: 40-80%
- Storage and transportation condition:  
Temperature: 8-40°C  
Humidity: 0-85%
- Maximum operating altitude: 2000 m
- To avoid shortening the lifespan of the instrument, use the M8-H Autostage in a location that meets the following criteria:  
Choose a location that has good air circulation.  
Do not use the M8-H Autostage in a location where there is large temperature variability or high humidity.

## **19.5 Safety Instructions and Guidelines**

- This device can be used with potentially biohazardous materials. Use appropriate personal protective equipment (gloves, safety goggles, lab coat, etc.) for handling and disposing of biohazardous materials.
- Under normal condition, the sound pressure level from the M8-H Autostage does not exceed 80 dB and so does not cause a hazard. Please contact technical support in case of a higher sound pressure level.
- This device can be hazardous due to the use of chemical and biohazardous substances.
- Users should adhere to their institutional guidelines for the handling and disposal of all infectious substances used with this device.
- It is important to clean the device after every use. If samples or reagents have been spilled, it is important to clean the instrument immediately with alcohol to avoid damage or contamination of samples.
- This device is to be used with the compatible spin tips. Using incompatible spin tips may cause poor extraction performance.
- Read this user manual and the warning notes on the M8-H Autostage in its entirety prior to operating the device. Failure to read, understand, and follow the instructions in the manual may result in damage to the device, injury to the laboratory and operating personnel, or poor device performance.

## 19.6 Before Usage

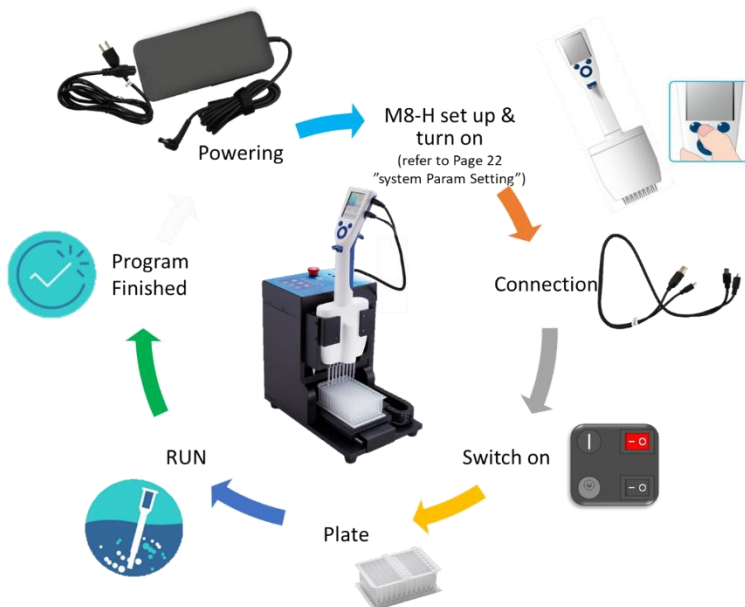
1. Attach the adapter plug to the transformer.
2. Connect the M8-H and the M8-H Autostage with the transmission cable.
3. Set “enable” connection on the M8-H.
4. Place the 96-well plate on the slider, and checking the relative position.



If further assistance is required, please contact your local distributor or manufacturer (TANBead).


## 19.7 Operating Procedure

NOTE: **Always** to turn on the M8-H first, following by the M8-H Autostage.





### 19.8 Powering

It is feasible to use AC 100~240 (volts) for the adapter. DC 19 volts is used on the Autostage. Notice: The heater button is the switch for the heated carriage plate; the power button is the switch for the M8-H Autostage (excluding the heating function).

	<p>The black switch is for the Power and the red one is for the Heater.</p> <ol style="list-style-type: none"><li>1. To power on the device, press the black (Power) and the red (Heater) switches to the “-” position.</li><li>2. To power off the device, press the black (Power) and the red (Heater) switches to the “o” position.</li></ol> <p>NOTE: Please switch on Power and Heater switches together for ensuring the heating function is available during experiments.</p>
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### 19.9 Standby Mode

After resetting or finishing the program, the Autostage will stay on the standby mode. In this state, user can to move the heated carriage plate by using right / left direction button ( ← / → ) and holster by using down button ( ↓ ).

	<ol style="list-style-type: none"><li>1. Standby mode: the POWER and RUN LED lights are lit.</li><li>2. You can choose a program from the M8-H.</li></ol>
	<ol style="list-style-type: none"><li>1. When the RUN LED light is flashing, the M8-H Autostage is in operation or resetting. Do not move the M8-H Autostage or the M8-H.</li></ol>




## 19.10 Heating Mode

The temperature of the heated carriage plate can be set up in the M8-H. The maximum temperature is 70°C.

	<ol style="list-style-type: none"><li>1. Ensure the heating switch is on.</li><li>2. The temperature of the M8-H Autostage is increasing when the HEATING LED light turns red.</li></ol> <p>CAUTION: Keep away from heated carriage plate.</p>
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## 19.11 Emergency Mode



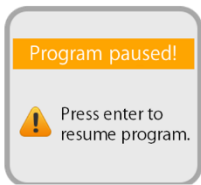
Pushing the emergency stop can stop running the M8-H Autostage immediately and alert with a warning tone. Please follow the steps below for exiting the emergency mode.

	<ol style="list-style-type: none"><li>1. The SCRAM RED LED light is on when user hears a warning tone.</li></ol>
	<ol style="list-style-type: none"><li>2. Twist the red "PUSH" button clockwise (follow the direction shown on the button).</li><li>3. After release the switch, the SCRAM RED LED light will be off.</li></ol>
	<ol style="list-style-type: none"><li>4. Press the [RESET] button.</li></ol>

## 19.12 Elution Setting




The M8-H Autostage provides an Elute function to perform elution directly in PCR tubes. With the adaptor of the 8-strip-PCR tube, the elution can be performed in the 8-strip-PCR tube directly. User can switch the height setting for elution in deep well plate (L) or 8-strip-PCR tube (H) by pressing the ELUTE button.



	<ol style="list-style-type: none"> <li>1. Elute at low position: Elute at the standard mode</li> </ol>
	<ol style="list-style-type: none"> <li>1. Elute at high position: Elute with the 8-strip-PCR tube NOTE: the frame of a 8-strip-PCR tube should be placed firmly on the plate and a 8-strip-PCR tube is added on top of the plate.</li> </ol>
	<ol style="list-style-type: none"> <li>1. "Elute" position is adjustable: -before starting a program -press the [PAUSE] button during the program (A message shown as left will be displayed on the M8-H)</li> </ol>

## 19.13 Error Messages

How to exit Error Messages:

NO.	Description & Solution	Error messages	
		LED	Alarm
1	When "PUSH" button is pushed -> rotate the button and press the RESET button		YES
2	Heating LED turns orange -> Check if the heating switch is on		YES
3	Run LED has no function -> Press the RESET button		NO

## Cleaning and Maintenance

- If samples or reagents have been spilled, it is required to clean the device immediately with alcohol to avoid damage or contamination of the samples.
- Wear gloves and appropriate personal protective equipment. If the device is used with biohazardous materials, dispose of any cleaning materials used in accordance with your institutional guidelines.
- If the M8-H Autostage can't be operated normally or makes abnormal sounds, please stop the operation and contact your supplier for assistance if necessary.

## **19.14 Disposal**

In case the product is to be disposed of, the relevant legal regulations are to be observed. As disposal regulations may differ from country to country, please contact your supplier if necessary. Please follow your institutional and country-specific requirements to handle the disposal of accessories. Device must be decontaminated prior to disposal.

## **Manufacturer**



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