

# Nucleic Acid Automatic Extraction System

## User Manual

Manufacturer:

GeneReach Biotechnology Corporation

TEL: 886-4-2463-9869      Email: [sales@genereach.com](mailto:sales@genereach.com)

No. 19, Keyuan 2<sup>nd</sup> Road, Central Taiwan Science Park, Taichung City 407, Taiwan

Website: [www.genereach.com](http://www.genereach.com)














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## Symbols

	<b>Conformité Européenne</b>
	<b>Date of manufacturing</b>
	<b>Manufacturer</b>
	<b>EU authorized representative</b>
	<b>Catalog number</b>
	<b>Serial number</b>
	<b>Alternative current</b>
	<b>Protective earth</b>
	<b>Supplementary fuse</b>
	<b>Warning, biological hazards</b>
	<b>Caution, consult instructions for use.</b>
	<b>WEEE symbol</b>
	

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU. Please follow your institutional requirements for disposal of the accessories.

## 1 Introduction

The **taco™** Nucleic Acid Automatic Extraction System (**taco™**) is a magnetic bead-based nucleic acid extraction and purification device. Nucleic acids bind to silica-coated magnetic beads, which can be separated easily from biochemical contaminants in the solution through automatic transfer and processing of magnetic beads. Purified nucleic acids could be eluted from the beads after several washing steps.

### 1.1 Intended Use

**taco™** is developed to work with nucleic acid extraction kits developed by GeneReach Biotechnology Corporation (GeneReach) to extract nucleic acids from samples for research purpose.

This product is intended for professional use by properly-trained laboratory technicians familiar with molecular biology techniques.

### 1.2 taco™ Extraction Principle

**taco™** is based on the magnetic separation technology to work with the specially designed disposable **taco™** Plate & Comb which are provided with all reagent kits.

Samples and reagents, including the magnetic particles, are dispensed into wells of the extraction plate manually according to instructions of the kit before extraction starts. The automated steps performed by **taco™** include:

- Transfer of magnetic beads and mixing magnetic beads with samples.
- Sample lysis.
- Binding of nucleic acids to magnetic beads.
- Washing steps to remove biochemical other than nucleic acids.
- Elution of nucleic acids from magnetic beads.

## 2 taco™ Layout

### 2.1 Product Components

Component	Quantity
taco™	1
User Manual	1
Warranty Card	1

### 2.2 taco™ Specifications

Specification	
Dimensions (W × D × H)	42 cm × 30 cm × 38 cm;
Net Weight	23.4 kg;
Power Requirement	100-120V/ 200-240V AC, 50/60 Hz, 2A;
Fuse	F2A/250V;
Operating Condition	10~40°C, up to 80% RH;
Operation Altitude	Under 5000 meters;
Transportation Condition	-29~50°C, 55±20% RH;
Storage Condition	10~40°C, 30~80% RH;
Throughput	24 samples;
Extraction time	Within 1 hour.

### 2.3 Equipments to Be Supplied by User

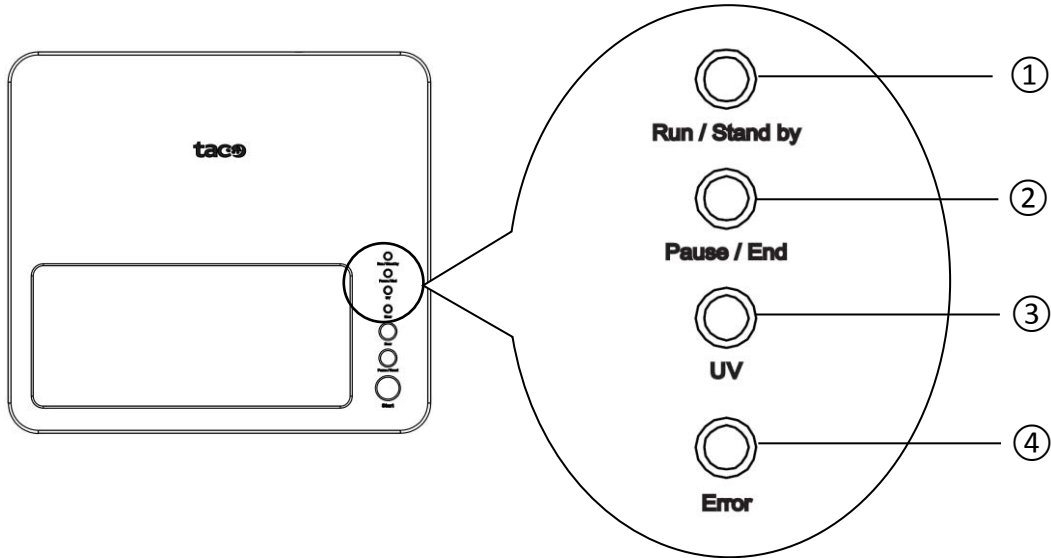
- taco™ Nucleic Acid Extraction Kit
- taco™ Plate & Comb
- Uninterrupted power system (UPS) (optional)
- Laminar air-flow (optional)
- Disposable gloves
- Protective goggles
- Lab coat

**Note:** To avoid power failure, connecting taco™ to an UPS is recommended.

**Note:** Use non-recommended consumables may cause damage to the instrument.

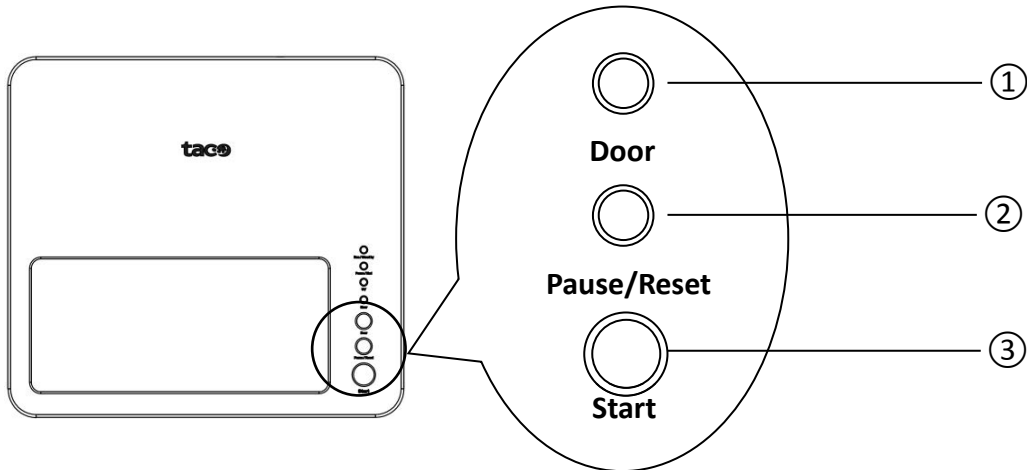
## 2.4 Front View of taco™

### 2.4.1 LED Light Signals



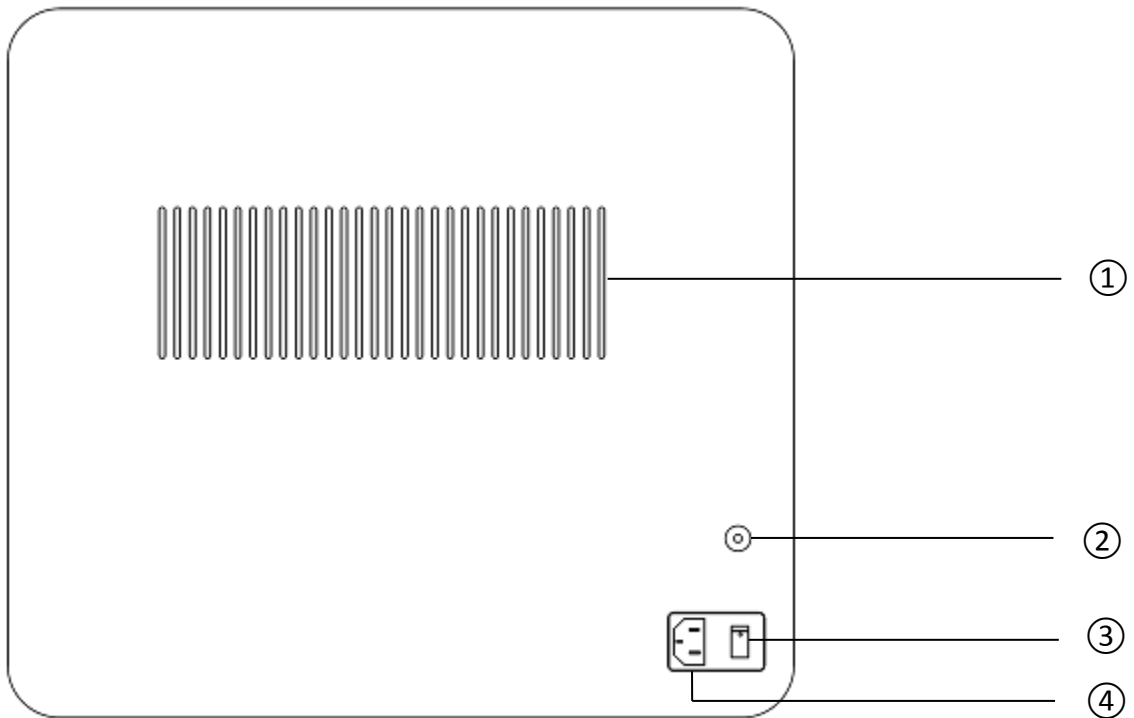
No.	Indicator *LED light Color	Signal	Description
1	Run/Stand-by signal *Green	Lights on	Self-test passed. Ready to run.
		Lights flashing	Extraction in progress.
2	Pause/End signal *Yellow	Lights on	Extraction finished.
		Lights flashing	Extraction paused.
3	UV On signal *Green	Lights on	UV lamp on.
4	Error signal *Red	Lights on	Any error occurred.

### 2.4.2 Operation Buttons



No.	Button	Description	Function disabled under the following status
1	Door	Press to open/close the door.	<ol style="list-style-type: none"> <li>1. During the extraction.</li> <li>2. UV lamp is on.</li> </ol>
2	Pause/Reset	Short press to pause the machine.	<ol style="list-style-type: none"> <li>1. During magnetic bead transfer.</li> <li>2. During magnetic bead drying.</li> <li>3. UV lamp is on.</li> </ol>
		While paused or extraction finished, long press to reset the machine	Reset is functional only when extraction is paused or finished.
3	Start	Press to start/resume the machine.	<ol style="list-style-type: none"> <li>1. Door is open.</li> <li>2. UV lamp is on.</li> </ol>

2.5 Rear View of taco™

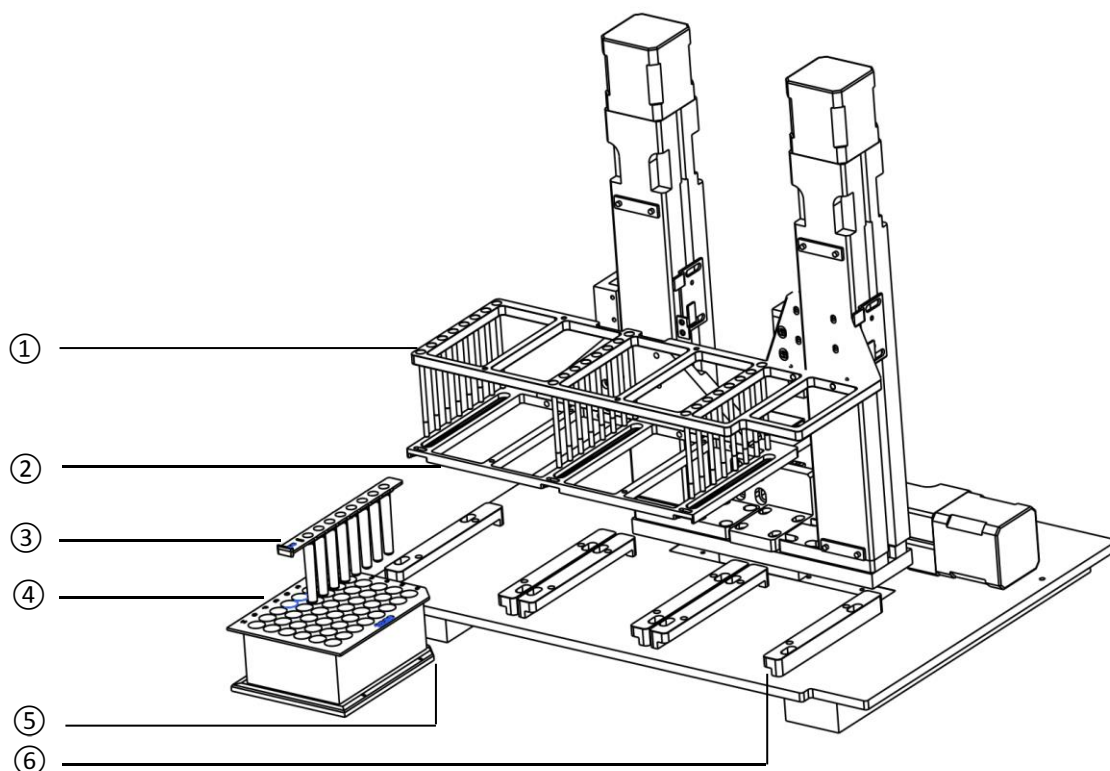


No.	Item	Description
1	Cooling vents	Ventilation
2	UV lamp switch	To turn on/off the UV light
3	Main switch	To turn on/off the main power
4	Socket	To connect to the power cord



## 2.6 Loading taco™ Plate & Comb

### 2.6.1 Loading the 48-Well Extraction Plate

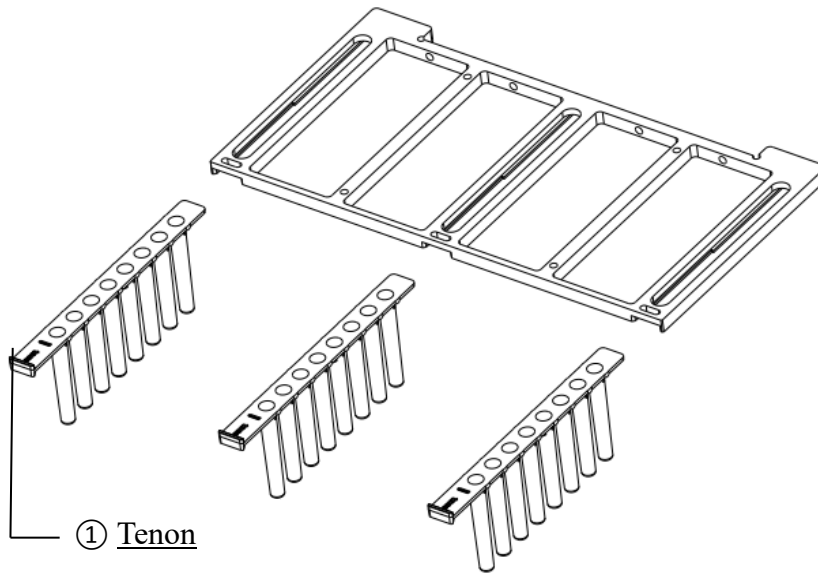


No.	Item	Description
1	Magnetic rod module	Shipping anchor of the magnetic rod.
2	Lower rack	Housing for the Mixing Comb.
3	Mixing Comb	Protection of magnetic rods and mixing of sample with magnetic bead.
4	48-Well Extraction Plate	Deep-well plate for extraction. Use one Mixing Comb for each 48-Well Extraction Plate when processing extraction.
5	Notched corner of the 48-Well Extraction Plate	The 48-Well Extraction Plate should be fully inserted into the plate holder with the notched corner pointing to far right.
6	Plate holder	Housing for the 48-Well Extraction Plate.

**Note:**<sup>1</sup> The Mixing Comb and the 48-Well Extraction Plate should be placed in the same slot when processing extraction (See illustrations above).

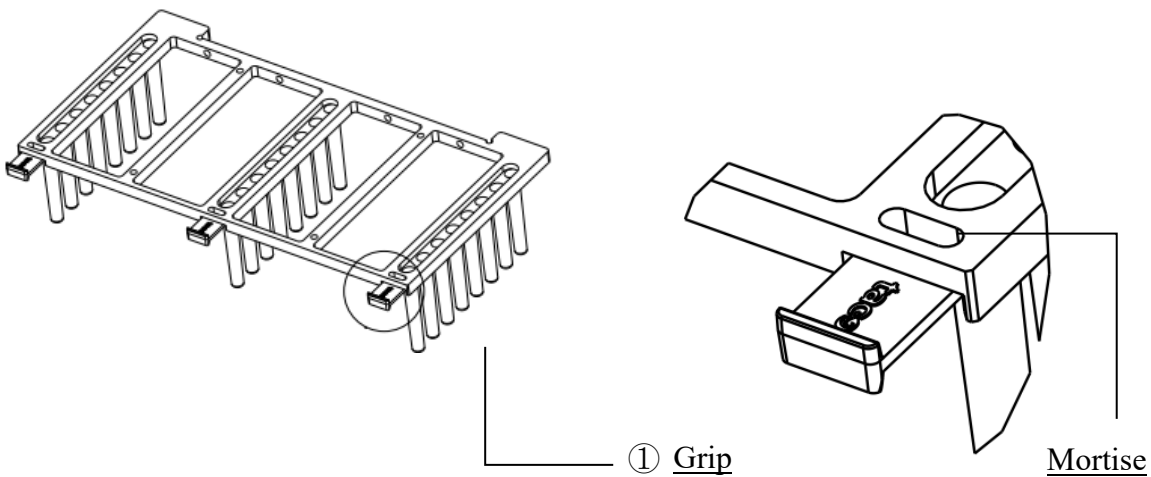
<sup>2</sup> Inadequate installation of taco™ Plate & Comb may damage the machine.

### 2.6.2 Loading the Mixing Comb



No.	Item	Description
1	Tenon of Mixing Comb	Slide the Mixing Comb into position. Make sure the tenon on the Mixing Comb is inserted fully into the mortise on the lower rack.

### 2.6.3 Releasing the Mixing Comb



No.	Item	Description
1	Grip of Mixing Comb	Press the grip of Mixing Comb to release.

**Note:** Use of non-recommended consumables may affect performance of the device.

### 3. Important Notes

After receiving **taco™**, please check the instrument and accessories for any damages. Should any questions arise, please contact your local distributor or GeneReach immediately. Any damaged components may lead to poor performance of the instrument.

#### 3.1 Safety Information



**Not following the instructions may cause personal injury or device failure.**

- Please carefully read these warnings, precautions and safety/operating instructions completely before operating this product.
- Electromagnetic Compatibility: This product complies with the emissions and immunity requirements of IEC 61326. It is advisable to evaluate the electromagnetic environment prior to operating the device. Do not use this device in close proximity to sources of strong electromagnetic radiation (for example, unshielded intentional radio frequency (RF) sources). Strong electromagnetic radiation may interfere with the proper operation of the device.
- Place **taco™** in a room with good ventilation.
- Operation temperature range: 10~40°C.
- Make sure the working area is clean, dry, flat, and vibration-proof; leave enough room for cables, lids, and other accessories.
- Do not touch any plugs and electric switches with wet hands. Make sure to keep **taco™** away from water.
- Do not unplug by pulling on power cord. Hold the plug, not the cord, to unplug.
- Keep power cord away from any hot surface.
- Turn off and unplug the machine before moving it.
- Package **taco™** carefully before moving and/or delivery. Vibrations or crashes may lead to damage.
- Users should revalidate **taco™** if the device has been moved.
- Waste disposal must be in compliance with local laws.
- When handling infectious materials, always wear a lab coat, disposable gloves and protective goggles.
- Do not look straight at the UV light while lights are on.
- Do not repair the machine yourself, including fixing the door and changing the UV lamp. Contact your local distributor or GeneReach directly to deal with the problems.

## 3.2 Emergency Stop

- 3.2.1 Should any emergency occur, press the “**PAUSE**” button or turn off the “**MAIN SWITCH**” to stop **taco™**.
- 3.2.2 After all emergency is cleared, please follow the instruction to resume/ restart **taco™** (See 4.1 and 4.2).

## 4. Operation Procedure of **taco™**

### 4.1 How to Start **taco™**

- 4.1.1 Load reagents to 48-Well Extraction Plate in advance (See **taco™** nucleic acid extraction kit manuals for instruction).
- Note:** Please make sure the total volume of each well does not exceed 900 µl before extraction.
- 4.1.2 Plug in **taco™** and switch on the main power. The device will complete self-check within 3 minutes and be ready when the “**Run/Stand By**” signal lights are on.
- 4.1.3 Press the door button to open the door of **taco™**, load 48-Well Extraction Plate and Mixing Comb according to the instructions (See chapter 2.6 “Loading **taco™** Plate & Comb”).
- 4.1.4 Push the 48-Well Extraction Plate and Mixing Comb into the plate holder and lower rack, respectively. Ensure they are in the correct position.
- 4.1.5 Press the door button of **taco™** to close the door.
- 4.1.6 Press “**START**” to begin the extraction.

**Note:** Operate **taco™** only under room temperature (10~40°C).

**Note:** Under the circumstances listed below, the “**START**” button is **nonfunctional**:

- The UV lamp is on.
- While the door of **taco™** is open.

### 4.2 How to Pause **taco™**

- 4.2.1 During extraction, press the “**PAUSE**” button to stop **taco™** if necessary. The **yellow LED light** will flash while the device is paused.
- 4.2.2 The magnetic rods module and Mixing Combs will move up to the top together.
- 4.2.3 Close the door of **taco™**, and press “Start/Resume” to resume extraction.

**Note:** Under the circumstances listed below, “**Pause**” button is **nonfunctional**:

- During the drying and transferring process of magnetic bead.
- The UV lamp is on.

### 4.3 How to Reset taco™

- 4.3.1 After extraction is finished, the **yellow LED light will be on together with a long beep sound.**
- 4.3.2 **Long press** the “**DOOR**” button to stop the alarm and open the door.
- 4.3.3 Take out the 48-Well Extraction Plate and Mixing Comb; the extracted nucleic acids are ready for subsequent applications.
- 4.3.4 To reset taco™, **long press** the “**PAUSE/RESET**” button.
- 4.3.5 After a short beep sound, taco™ is reset and ready when **the green LED lights are on.**

**Note:** Please transfer the extracted nucleic acids to a new tube immediately after extraction. Quality of nucleic acids may decline otherwise.

**Note:** The “**Reset**” button is **only functional** when:

- Under **PAUSE** status.
- Extraction is finished.

### 4.4 When and How to Turn on UV Lamp

- 4.4.1 After the extraction is finished, remove the 48-Well Extraction Plate and Mixing Comb and press the “**RESET**” button.
- 4.4.2 Press the **UV light switch** at the rear of taco™ to turn on UV lamp for sterilization of the space.
- 4.4.3 Sterilization will continue for 30 minutes. To manually turn off the UV lamp, press the **UV light switch** again.

**Note:** Under the circumstances listed below, the “**UV light**” switch is **nonfunctional**:

- Reset is not done after extraction.
- The door of taco™ is open.
- During the extraction process.

### 4.5 How to Shutdown taco™

- 4.5.1 Before switching off taco™, please make sure 48-Well Extraction Plate and Mixing Comb is removed from the device.
- 4.5.2 Press the door button to close the door.
- 4.5.3 Turn the main switch off.

## 5. Cleaning and Maintenance

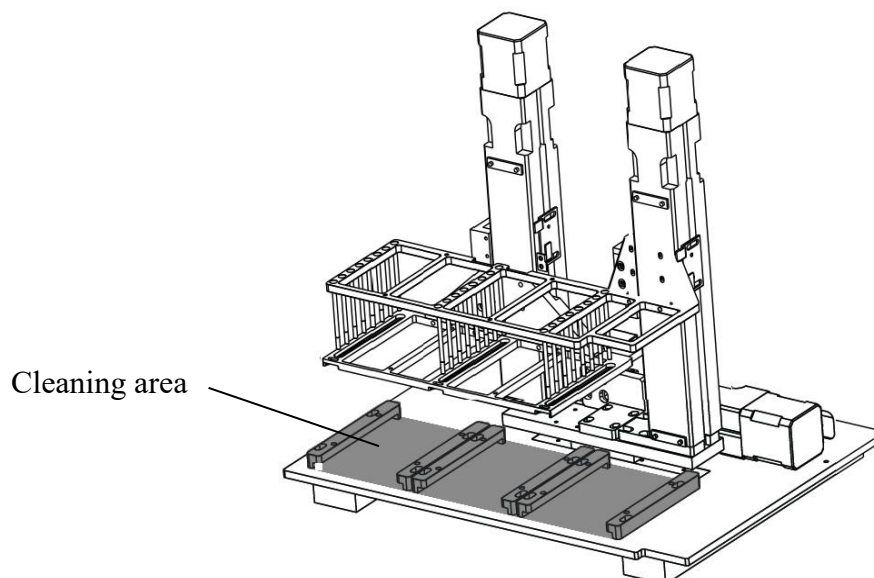
### 5.1 General Care

- Do not disassemble **taco™** for cleaning. This will void the warranty.
- Never allow liquids to sit on any surfaces of the device for extended periods of time.
- Do not use solvents, detergents or bleaches to clean the magnetic rods. Use only clean and wet paper towel to wipe off stains on magnetic rods.

**Note:** Wear gloves or other protective gears. Always turn off and unplug **taco™** before cleaning.

### 5.2 Dealing with Spills

- Wipe off any visible stains on the cleaning area (see illustration below) with disposable paper towel immediately.
- In case of serious liquid spills, please contact your local distributor or GeneReach for assistance. Do not dismantle the instrument for cleaning.
- Please make sure the total volume of each well does not exceed 900  $\mu$ l before extraction.
- Using UV light for sterilization after each extraction is recommended.



## 6. Troubleshooting

### Comments and Suggestions

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#### taco™ does not perform normally

- |   |   |
|---|---|
| (a) No LED light signals  | <ul style="list-style-type: none"> <li>● Check to see if the plus has been connected to the power system.</li> <li>● Check to see if the main power has been switched on.</li> <li>● Check voltage of electricity outlet (see 2.2 <i>taco™ Specifications</i>).</li> <li>● Contact your local distributors or GeneReach for assistance.</li> </ul>                |
| (b) Self-test too long  | <ul style="list-style-type: none"> <li>● Contact your local distributors or GeneReach for assistance.</li> </ul>  |
| (c) The magnetic rods module and lower racks are not in the correct positions | <ul style="list-style-type: none"> <li>● Contact your local distributors or GeneReach for assistance.</li> </ul>  |
| (d) Unusual noises from the machine.  | <ul style="list-style-type: none"> <li>● Check the Mixing Comb to see if they have been pushed into the lower rack.</li> <li>● Check the 48-Well Extraction Plate to see if it has been pushed into the plate holder.</li> <li>● Check that there is nothing preventing the track from moving.</li> <li>● Contact your local distributor or GeneReach.</li> </ul> |
| (e) Liquids spill and adhered to device                                       | <ul style="list-style-type: none"> <li>● The total volume of each well should not exceed 900 µl.</li> <li>● Use UV light for sterilization and then clean <b>taco™</b> with water or a laboratory detergent. Repeat the extraction procedures with new samples and reagents.</li> </ul>   |

#### Magnetic rod function failures

- |                                 |  |
|---------------------------------|--|
| (a) Stains on the magnetic rod. | <ul style="list-style-type: none"> <li>● Ensure the Mixing Combs are installed before each extraction.</li> <li>● Use clean and wet paper towel to wipe stains off carefully. Do not use any solvents or detergents to clean the magnetic rods.</li> <li>● Contact your local distributor or GeneReach.</li> </ul> |
|---------------------------------|--|

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**Comments and Suggestions**

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- (b) The magnetic rods come off from the heat-shrink sleeve ● Contact your local distributor or GeneReach.

**UV lamp function failures**

- UV light signals not on ● Check that the door is closed. The UV lights are designed not to operate while the door is open.  
● Check to see if **taco™** is in extraction mode. UV lights cannot operate during extraction.  
● Contact your local distributor or GeneReach for assistance.

**Door function failures**

- The door of **taco™** cannot open/ close normally ● Contact your local distributor or GeneReach for assistance.