User's Guide

PIPETMAX® 268

pipetmax®

GILSON®

TABLE OF CONTENTS

SAFETY

Read this section before installing and operating PIPETMAX® 268.

This instrument is intended to be used in a laboratory environment by trained technical personnel.

For safe and proper use of this instrument, it is required that both operating and service personnel follow the instructions contained in this guide when installing, cleaning, and maintaining the instrument.

The following safety precautions must be observed during all phases of operation, service, and repair of the instrument. Failure to comply with these precautions or with specific warnings elsewhere in this user's guide violates safety standards of design, manufacture, and intended use of the instrument. Gilson assumes no liability for the customer's failure to comply with these requirements.

The instrument complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This instrument may not cause harmful interference, and (2) this instrument must accept any interference received, including interference that may cause undesired operation. Shielded cables must be used with the instrument to ensure compliance with the FCC Class A limits.

PIPETMAX has been certified to safety standards required in Canada, Europe, and the United States. Refer to the instrument rear panel label and the Declaration of Conformity document for the current standards to which the instrument has been found compliant.

Electronic and Hazard Symbols

Symbol	Explanation
▬ ▬ ▬	Direct current
|	Electrical power ON
O	Electrical power OFF
⚠	Caution
⚠	Mechanical hazard

Safety Notices

The following safety notices may appear in this document:

⚠WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, may result in serious injury
⚠CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury
NOTICE	NOTICE indicates a potentially hazardous situation which, if not avoided, may result in equipment damage

Voltage

Access to the rear panel is necessary because the instrument must be detached from all voltage sources before service, repair, or exchange of parts.

Operate the instrument using the approved power supply provided and only at the voltage specified on the rear panel label of the instrument.

Safety Interlocks

The instrument is configured with one of two safety interlocks. One interlock is used when the rotating cover is installed on the instrument, and the other interlock is an external sensor and is used when the instrument is located in a hood.

The safety interlocks prevent the instrument from operating when the rotating cover or hood door is open.

When the instrument is installed in the hood, the external sensor must face the door of the hood and be located within 15 cm (6 in) of the door.
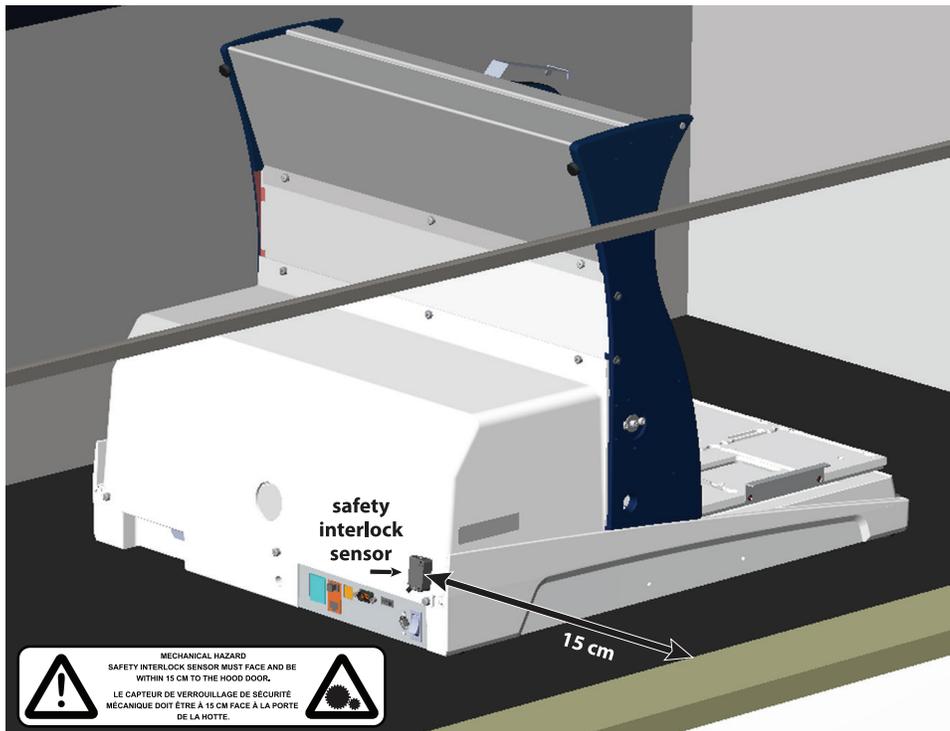

Figure 1
PIPETMAX 268 Configured with External Safety Interlock Sensor and Placed in Hood

Pipette Heads

The instrument is capable of generating significant forces that could cause potential injury to the user. For an instrument with the rotating cover installed, the safety interlock in the cover will disable the instrument movement if the cover on the instrument is open. For an instrument installed in a hood, the external safety interlock sensor mounted on the instrument will disable the instrument movement if the hood door is open.

Tip Waste Container

The tip waste container may contain residues of flammable or infectious liquids in ejected tips.

If you use flammable liquids (e.g., ethanol 98%), treat the waste before disposing of it in accordance with your laboratory guidelines.

Dispose of infectious material, waste, or tips in accordance with national and local safety regulations.

Tray

The moving tray is capable of causing injury by pinching. For an instrument with the rotating cover installed, the safety interlock in the cover will disable the instrument movement if the cover on the instrument is open. For an instrument installed in a hood, the external safety interlock sensor mounted on the instrument will disable the instrument movement if the hood door is open.

Liquids

Observe safe laboratory practices when handling liquids. If working with biological samples or chemical substances, ensure that there is proper ventilation, and wear personal protective equipment (PPE), such as safety glasses, gloves, and protective clothing at all times.

Refer to the Material Safety Data Sheets for solvents before use.

Replacement Parts

Be sure to use only replacement parts specified in this user's guide. Do not repair or change parts which are not listed in this user's guide. If it is necessary to change parts not listed, please contact your local Gilson representative.

Chapter 1

INTRODUCTION

IN THIS CHAPTER

PIPETMAX® is an automated pipetting solution for the efficient processing of high-throughput biological assays. Unlike traditional automation platforms, PIPETMAX comes in a benchtop size that easily fits into any lab.

Unpacking

PIPETMAX is delivered with most major components already assembled. Keep the original packaging if PIPETMAX must be returned to the factory.

These instructions assume that you have already cut the shipping straps and tape and have cut open the box.

1. Remove the open-ended cardboard box.

2. Remove the box of accessories and open it.

3. Lift the printed, outer cardboard box up to remove.

    > ⚠️ **CAUTION** — It is recommended that two people lift PIPETMAX out of the box as it weighs approximately 24.9 kg (55 lbs.).

4. Grip PIPETMAX at the recesses near the base. There is one recess in the front, one in the back, and one on each side. Use these recesses when lifting PIPETMAX out of the foam-lined, cardboard tray.

    > **NOTICE** — Do not attempt to lift PIPETMAX from the cover or from the X-arm (the horizontal arm). Always lift the instrument from its base.

5. Place PIPETMAX with cover on a lab bench.

    PIPETMAX is configured with one of two safety interlocks. One interlock is internal to the rotating cover installed on the instrument, and the other interlock is an external sensor used when the instrument is located in a hood. The safety interlocks prevent the instrument from operating when the rotating cover or hood door is open. If PIPETMAX was ordered without a rotating cover, it must run in a hood. When the instrument is installed in the hood, the external sensor must face the door of the hood and be located within 15 cm (6 in) of the door.
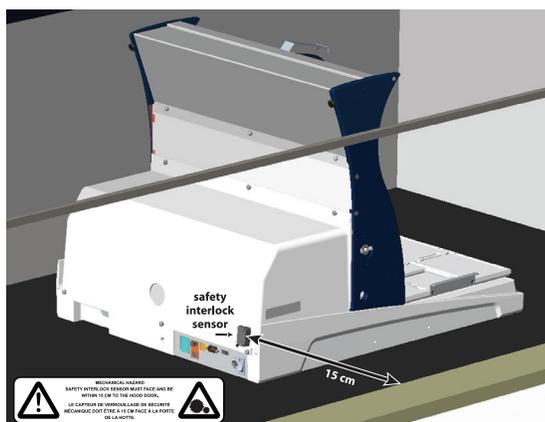

Figure 2
PIPETMAX Configured with External Safety Interlock Sensor and Placed in Hood

6. Remove the film protecting the rotating cover (if installed).

7. Remove the shipping screws and bracket using the tool provided and then store the shipping screws and bracket in the rear panel for future use if PIPETMAX needs to be shipped or transported.

8. Remove the shipping brace from the rear panel by loosening the thumb screws securing the shipping brace to PIPETMAX. After removing and storing the shipping brace, tighten the thumb screws.

Figure 3
Shipping Screws
(Front View of PIPETMAX®)

Figure 4
Shipping Brace
(Rear View of PIPETMAX®)

9. Remove the foam block preventing the tray from moving.

10. Remove the tape securing the alignment cable.

Standard Equipment

After PIPETMAX and its accessories are unpacked, you should have the following:

- PIPETMAX with alignment head, dual eight-channel tip ejector foot, and rotating cover or external safety interlock sensor installed
- Allen Wrench (for removing shipping bracket)
- USB Cable
- Tip Reload Block
- Tip Disposal Bin
- USB Drive
- Black Plug
- Power Supply
- Power Cord

DOCUMENTATION

The following documents are included with PIPETMAX:

- Installation Qualification/Operational Qualification (IQ/OQ) Procedures
- Declaration of Conformity
- Quality Control (QC) Checklist
- Items Included Checklist
- Setup Guide
- Packing List
- Gilson Quality Control Report Pipette Head (one for each pipette head)

Accessories

REQUIRED

Some accessories are required, but are ordered separately.

- Tablet with TRILUTION® micro Software pre-loaded or TRILUTION micro on a USB drive for installation on a PC
- Pipette Head(s)
- Removable Tray
- BLISTER REFILL
- Racks

For part numbers, refer to

OPTIONAL

The following optional accessories are also available:

- Tablet Holder
- Riser Kit for Off-bed Tip Disposal
- Orbital Shaker
- Microscan 2D Barcode Reader

For part numbers, refer to

Technical Specifications

Please be aware of the following before operating PIPETMAX.

NOTICE	Changes or modifications to this device not expressly approved by Gilson could void the warranty.

PIPETMAX®

Technical Specification	Definition
Communication	USB
Connections	Three USB host ports and one USB device port Two inputs (contact closure, TTL), two relay outputs, and one switched +12V DC 1A output **NOTICE** Switching voltages higher than 30V or greater than 1A of current may damage the instrument.
Control	Touchscreen tablet or PC control via USB and TRILUTION® micro Software
Dimensions (W x D x H)	**PIPETMAX with rotating cover** 54.4 x 65.5 x 53.1 cm (21.4 x 25.8 x 20.9 in) **PIPETMAX with rotating cover installed on optional riser assembly for off-bed tip disposal** 54.4 x 65.5 x 69.6 cm (21.4 x 25.8 x 27.4 in) **PIPETMAX without cover** 50.8 x 64.3 x 49.5 cm (20 x 25.3 x 19.5 in) **PIPETMAX without cover installed on optional riser assembly for off-bed tip disposal** 52.3 X 65 X 65.8 cm (20.6 x 25.6 x 25.9 in)
Environmental Conditions	Indoor use Altitude: up to 2000 m Temperature range: 5°C–40°C Humidity: Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C
Front Panel	Two USB host ports and STOP button
Labware Compatibility	Standard shallow- and deep-well microplates and microcentrifuge tubes

TECHNICAL SPECIFICATIONS

Technical Specification	Definition		
Liquid Contact Materials	Description	Material	
	Tips	100% Virgin Polypropylene	
	Tip Disposal Bin	Pro-fax 6523 (Polypropylene with colorant)	
	Tip Disposal Bin (Off-bed)	Polypropylene	
	Tip Chute	Pro-fax 6523 (Polypropylene with colorant) Aluminum 5052 with Hentzen, URA-ZEN, White, Matte Finish, Fine Texture Paint	

	Pipette Head	PIPETMAN® DIAMOND Tips	Pipette Head Volume Range (µL)	Flow Rate Range (mL/min)
Pipette Heads and PIPETMAN® DIAMOND Tips (Sterilized option available for some tips)	MAX8x20	DL10	1–20	0.0225–3.75
		DFL10	1–10	
		DF30	1–20	
		D200	1–20	
	MAX8x200	D200	20–200	0.225–37.5
		DF200	20–200	
	MAX4x1200	D1200	50–1200	1.125–187.5
		DF1200	50–1200	

All pipette heads have functional volume limitations due to the resolution associated with each head.

Pipette Head	Volume Resolution	Example		
		Requested Volume	Pipetted Volume	Reported Volume
MAX8x20	0.01 µL	10.456 µL	10.45 µL	10.456 µL
MAX8x200	0.1 µL	100.45 µL	100.4 µL	100.45 µL
MAX4x1200	1 µL	100.5 µL	100 µL	100.5 µL

When a user-entered volume or system-calculated volume is beyond the resolution of the pipette head, the software will truncate the volume to correct for the resolution limits. In some instances, the volumes may be incorrectly reported as the non-truncated values.

Technical Specification	Definition
Pipette Head Mounts	Two PIPETMAX Pipetting Heads
Positioning Performance	Machine Accuracy (without tips) in XYZ = +/-0.2 mm (0.008") System Accuracy (with current tips) in XYZ = +/-0.9 mm (0.035")
Power Requirements	**External Power Supply** **Voltage Input** Frequency: 50 to 60 Hz Voltage: 100–240V AC **Voltage Output** Voltage: 24V DC Current Rating: 6.25A, 150W
Removable Tray Capacity	9-position removable tray (microplate footprints, but not for 384-well microplates) 9-position removable tray for 384-well microplates
Safety and Compliance	PIPETMAX has been certified to safety standards specified for Canada, Europe, and the United States. Refer to the instrument rear panel label and the Declaration of Conformity document for the current standards to which the instrument has been found compliant.

Volumetric Specification for Transfers	Maximum Permissible Errors					
	Pipette Head	Volume of Distilled Water	Systematic Error (µL)	Random Error (µL)	Systematic Error (%)	Random Error (%)
	MAX8x20	1 µL	±0.08	≤0.05	8.00	5.00
		10 µL	±0.15	≤0.10	1.50	1.00
		20 µL	±0.25	≤0.12	1.25	0.60
	MAX8x200	20 µL	±0.50	≤0.16	2.50	0.80
		100 µL	±1.00	≤0.30	1.00	0.30
		200 µL	±2.00	≤0.50	1.00	0.25
	MAX4x1200	50 µL	±4.00	≤0.70	8.00	1.40
		120 µL	±4.00	≤0.70	3.33	0.58
		600 µL	±6.00	≤1.50	1.00	0.25
		1200 µL	±9.60	≤1.80	0.80	0.15

TECHNICAL SPECIFICATIONS

PIPETMAX®

Technical Specification	Definition			
Weight	24.9 kg (55 lbs.)			
XYZ Motion Parameters	X	Min	Max	Default
	Power	1%	100%	50%
	Speed	1 mm/sec	550 mm/sec	350 mm/sec
	Acceleration	Speed Value	4000 mm/sec^2	2200 mm/sec^2
	Y	Min	Max	Default
	Power	1%	100%	50%
	Speed	1 mm/sec	550 mm/sec	350 mm/sec
	Acceleration	Speed Value	4000 mm/sec^2	900 mm/sec^2
	Z	Min	Max	Default
	Power	1%	100%	60%
	Speed	1 mm/sec	140 mm/sec	120 mm/sec
	Acceleration	Speed Value	4000 mm/sec^2	650 mm/sec^2

Customer Service

Gilson, Inc. and its worldwide network of authorized representatives provide customers with the following types of assistance: sales, technical support, applications, and instrument repair.

If you need assistance, please contact your local Gilson representative. Specific contact information can be found at **www.gilson.com.** To help us serve you quickly and efficiently, please refer to **Before Calling Us** on page 39.

Chapter Two

SETUP/OPERATION

IN THIS CHAPTER

PIPETMAX® and its components should be set up in the order described in this chapter. TRILUTION® micro Software provides control of the PIPETMAX during setup and operation, which is described in this chapter. For more information about TRILUTION micro, view the help information in the software, accessible from the **?** button or the user's guide available on the website.

Placement

Place PIPETMAX with cover on a lab bench.

PIPETMAX is configured with one of two safety interlocks. One interlock is internal to the rotating cover installed on the instrument, and the other interlock is an external sensor used when the instrument is located in a hood. The safety interlocks prevent the instrument from operating when the rotating cover or hood door is open. If PIPETMAX was ordered without a rotating cover, it must run in a hood. When the instrument is installed in the hood, the external sensor must face the door of the hood and be located within 15 cm (6 in) of the door.
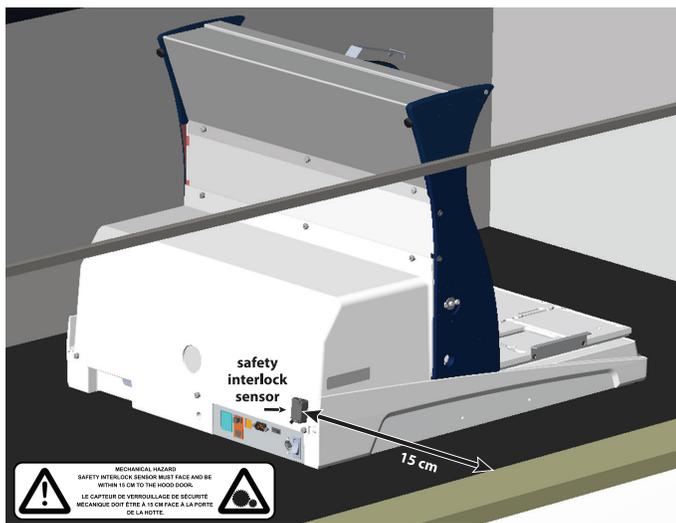

Figure 5
PIPETMAX® Configured with
External Safety Interlock Sensor and Placed in Hood

Removable Tray

A removable tray for placement of labware and tip racks is required.

Options

There are two removable tray options: 9-position removable tray (microplate footprints, but not for 384-well microplates) and 9-position removable tray for 384-well microplates.

9-POSITION REMOVABLE TRAY

When placing labware and tip racks on the 9-position removable tray, refer to the following information:

- Tip racks can be placed in the back row middle and right positions, and the front row middle position ONLY. These positions have installed clips to hold the tip racks in place. It is recommended to use a full rack of tips because an error may be encountered if using two partial racks of tips containing the same type of tip.

- The tip waste chute can be placed in the back row, left position ONLY. It is recommended to place the tip disposal bin in this position. It cannot be placed in positions with installed clips.

- All racks and plates can be placed in any position on the tray.

  Exceptions:

  - 384-well microplates cannot be placed on this tray.

  - A maximum of two thermal (PT or CT) racks total can be placed on this tray as these are considered heavy bed elements.

    - Refer to the instructions provided with the racks to modify the tray to allow for rack placement.

  - Circulating Temperature (CT) racks can be placed in the front row, left or right positions ONLY.

    - Refer to the instructions provided with the rack to modify the tray to allow for rack placement.

  - The Orbital Shaker for PIPETMAX® can only be placed in the front row, left or right positions ONLY.

9-POSITION REMOVABLE TRAY FOR 384-WELL MICROPLATES

When placing labware and tip racks on the 9-position removable tray for 384-well microplates, refer to the following information:

- Tip racks can be placed in the back row middle and right positions, and the front row middle position ONLY. These positions have installed clips to hold the tip racks in place. It is recommended to use a full rack of tips because an error may be encountered if using two partial racks of tips containing the same type of tip.

- The tip waste chute or tip disposal bin must be placed in the back row, left position ONLY.

- All racks and plates can be placed in any position on the tray.

  Exceptions:

  - A maximum of two thermal (PT or CT) racks total can be placed on this tray as these are considered heavy bed elements.
    - Refer to the instructions provided with the racks to modify the tray to allow for rack placement.
  - Circulating Temperature (CT) racks can be placed in the front row, left or right positions ONLY.
    - Refer to the instructions provided with the rack to modify the tray to allow for rack placement.
  - The Orbital Shaker cannot be placed on this tray.

INSTALLATION

While holding the handles on the sides of the tray, lower the removable tray onto the fixed tray. It is keyed and will only mount one way. Grip the removable tray and then gently rock it back and forth. If it seems that the removable tray is shifting position on the fixed tray, use a 3 mm Allen wrench and gentle pressure to adjust the spacers on either side of the fixed tray (see Figure 7 and Figure 8). Spacers should just barely contact the removable tray. Remove and then replace the removable tray to ensure there is not any significant interference.
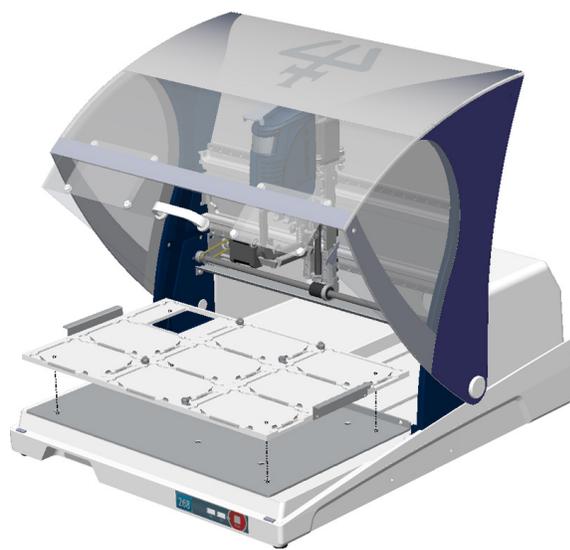

Figure 7
Tray Installation

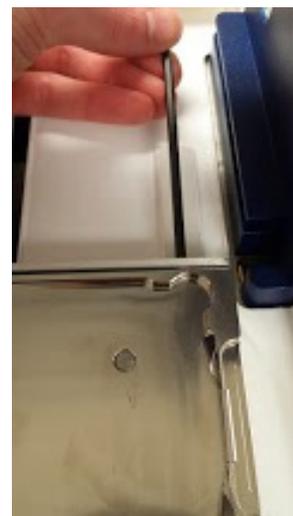**Figure 6**
Tray Installation

Figure 8
Tray Installation

Connections

Refer to the diagrams when making the connections described in this section.
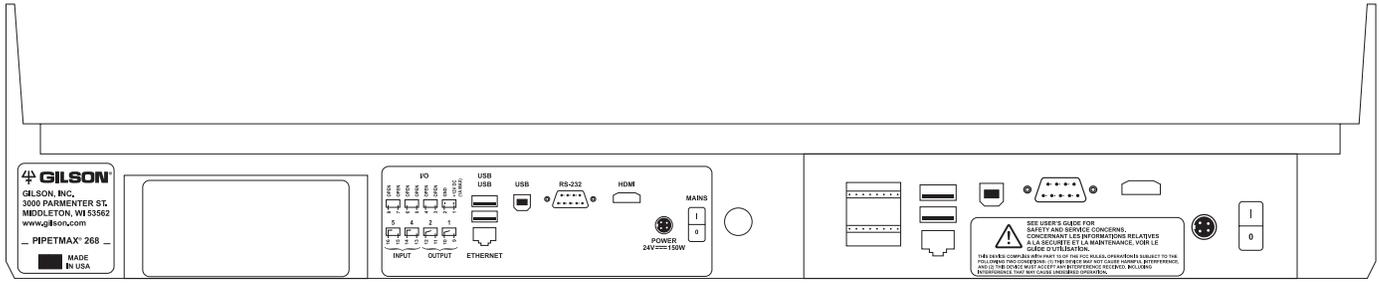
Rear Panel Diagrams
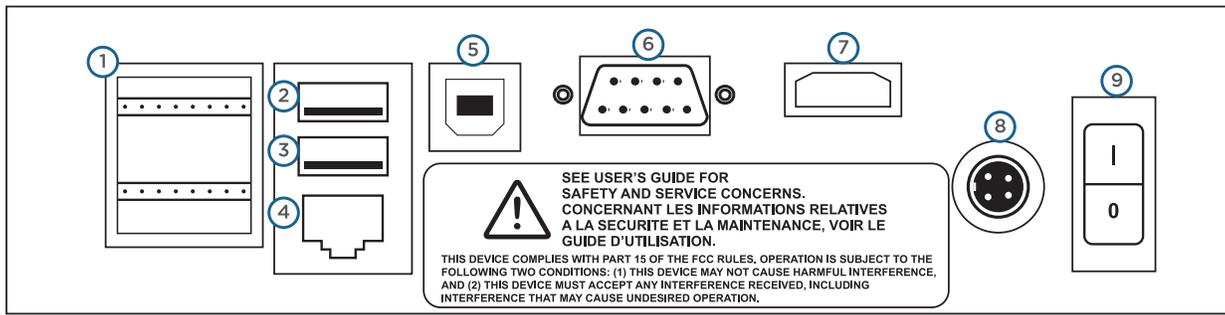

Figure 9
PIPETMAX® Rear Panel

Figure 10
PIPETMAX® Rear Panel Connections

1. **Input/Output**
2. USB host (Not Supported)
3. **USB host**
4. Ethernet (Not Supported)
5. **USB device**
6. RS-232 (Not Supported)
7. HDMI (Not Supported)
8. **Power receptacle**
9. **Power switch (MAINS)**

INPUT/OUTPUT

The input/output contacts on the rear panel are used for communication between the alignment head and TRILUTION micro and for communication between the external safety interlock sensor and TRILUTION micro. The contacts can also be used to control peripheral devices. Refer to Rear Panel Diagrams on page 21 for the location of the input/output ports.

Contact Inputs

The bottom terminal block on PIPETMAX has two paired input contacts that are labeled 4 and 5.

Never connect voltages higher than 5V DC to an input. When using TTL signals, be sure to match GROUND connections.

Contact Outputs

The bottom terminal block on PIPETMAX has two paired, isolated-relay contact closures that are labeled 1 and 2.

DC Power Output

The top terminal block has one +12V DC output, which is labeled.

Making Connections

The following are needed to make connections:

- 2-conductor cable (22–30 gauge for each wire)
- Wire insulation stripper

A 6-foot piece of suitable cable (part number 709910206) is available for purchase from Gilson.

To make connections with the 2-conductor cable:

1. Cut the cable into pieces of appropriate length.
2. Strip about 8 mm of insulation from each end of the cable.
3. Remove the terminal block connector from PIPETMAX.
4. Press in the spring-loaded retainer for the appropriate terminal on the terminal block connector. Insert each wire into the appropriate terminal on the terminal block connector and then release the spring-loaded retainer.
5. Reconnect the terminal block connector to PIPETMAX. Push the connector in as far as it will go. It is designed to fit snugly into its receptacle.
6. Connect the opposite ends of the wires to the other device(s). Be sure to match ground connections.
7. Label each cable to identify the purpose of the connection.

USB Host

PIPETMAX has one functional USB host port (the middle port) on the rear panel. The top port on the rear panel is not supported.

The USB ports can be used to connect USB drives (which can also be seen by the tablet or PC when plugged into PIPETMAX), keyboard, mouse, or any other compatible device (heater/chiller, barcode scanner, or shaker, for example).

Ethernet Port

Not supported.

RS-232

Not supported.

HDMI

Not supported.

USB Device

The USB device port is used for communication between PIPETMAX and the tablet or PC.

A USB cable is provided as a standard accessory. Refer to Rear Panel Diagrams on page 21 for the location of the USB device port.

Power Cord Connection

Use the power cord on the external power supply to make the connection between the power receptacle on PIPETMAX and the external power supply.

The connection from the external power supply to PIPETMAX uses a connector with a locking collar. Check the alignment of the pins and then push it in until it clicks and locks in place. To disconnect, pull back on the locking collar and then disconnect the cable from the rear panel of PIPETMAX.

Use the supplied power cord to make the connection between the external power supply and the AC power source.
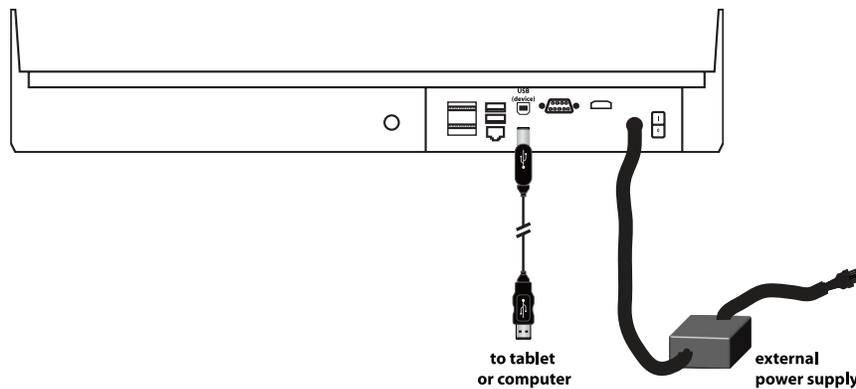

to tablet or computer   external power supply

Figure 11
PIPETMAX® Cabling

Drain Connection (Optional)

The PIPETMAX bed includes a drain. Optionally, connect a 1/8″ NPT fitting and drain tubing. Ensure that the waste container is lower than the bed of PIPETMAX.

drain

Figure 12
Drain Location

Front Panel Diagram

1. USB host
2. STOP

Figure 13
Front Panel Diagram

USB Host

PIPETMAX has two functional USB host ports on the front panel.

The USB ports can be used to connect USB drives (which can also be seen by the tablet or PC when plugged into PIPETMAX), keyboard, mouse, or any other compatible device (heater/chiller, barcode scanner, or shaker, for example).

STOP

In a situation where an emergency stop is required, pressing the **STOP** button stops PIPETMAX immediately. The protocol stops and results are displayed (after selecting **OK** on the notification).

Power On and Start Up

To start PIPETMAX:

1. Make sure that PIPETMAX is connected to the external power supply and that the external power supply is connected to a power source.

2. Turn PIPETMAX power on using the power switch located on the rear panel. The indicator light on the front panel illuminates.

3. Connect the tablet or PC to a power source and power it on.

4. Run the **PIPETMAX Alignment Utility** to ensure proper alignment. It is only necessary to run this protocol when setting up the instrument for the first time, or if instructed to do so by your local Gilson representative. For more information about running the PIPETMAX Alignment Utility, refer to the *PIPETMAX Alignment Utility Instructions* (LT255601) installed with the utility.

5. Start TRILUTION micro. Select **Start** and then select **(All apps)** > **Gilson Applications** > **TRILUTION micro x.x.**

6. Log in.

   The first time you start the software, no login or password is required. Optionally, set up users with permissions and require a password. If prompted, enter the **User name** and **Password** and then select **Accept** (or **X** to cancel).
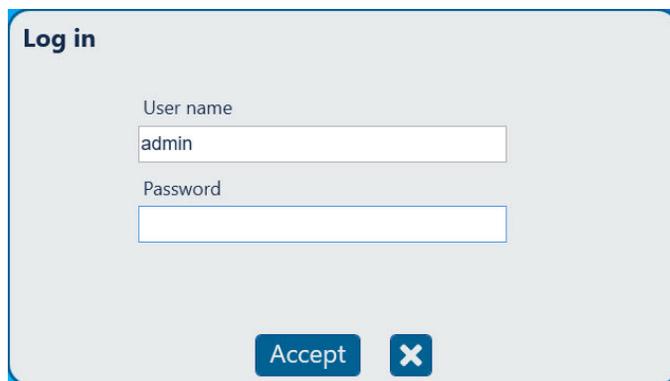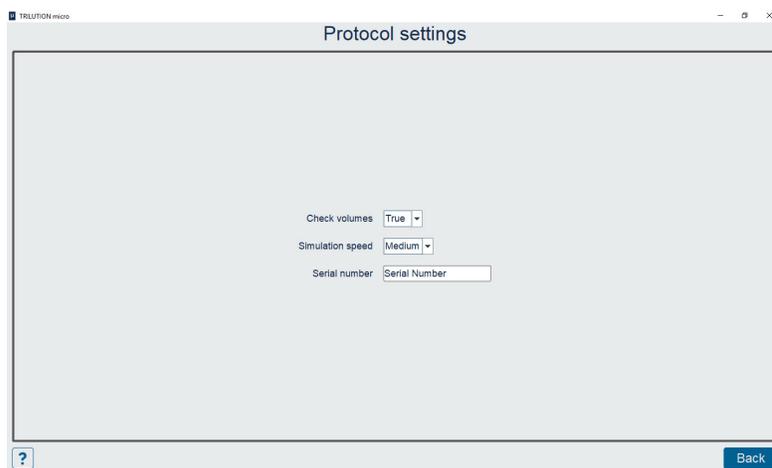

Figure 14
Log In

Prepare to Run a Protocol

Set Serial Number

If the serial number is not entered, then the software will not be able to communicate with PIPETMAX. The serial number is set on the tablet by Gilson. PC installations require the user to enter the serial number.

1. On the **Protocol Selection** screen, select ⚙ to access the **Settings** screen.

2. On the **Settings** screen, select **Protocol settings**.

3. Enter or verify the serial number for PIPETMAX in the **Serial number** field. The serial number for PIPETMAX is located on the inside panel of the right support.

4. Select **Back** and then do one of the following:

   ● If the serial number was not changed, select **Back** to return to the **Protocol Selection** screen.

   ● If you changed the serial number, you will be prompted to restart the software. First , select **X** to close the message box. Next, select **X** in the upper right corner to close the software. Select **Yes** when asked to confirm and then restart the software. (Select the **Start** button and then select **(All apps) > Gilson Applications > TRILUTION micro x.x**.)
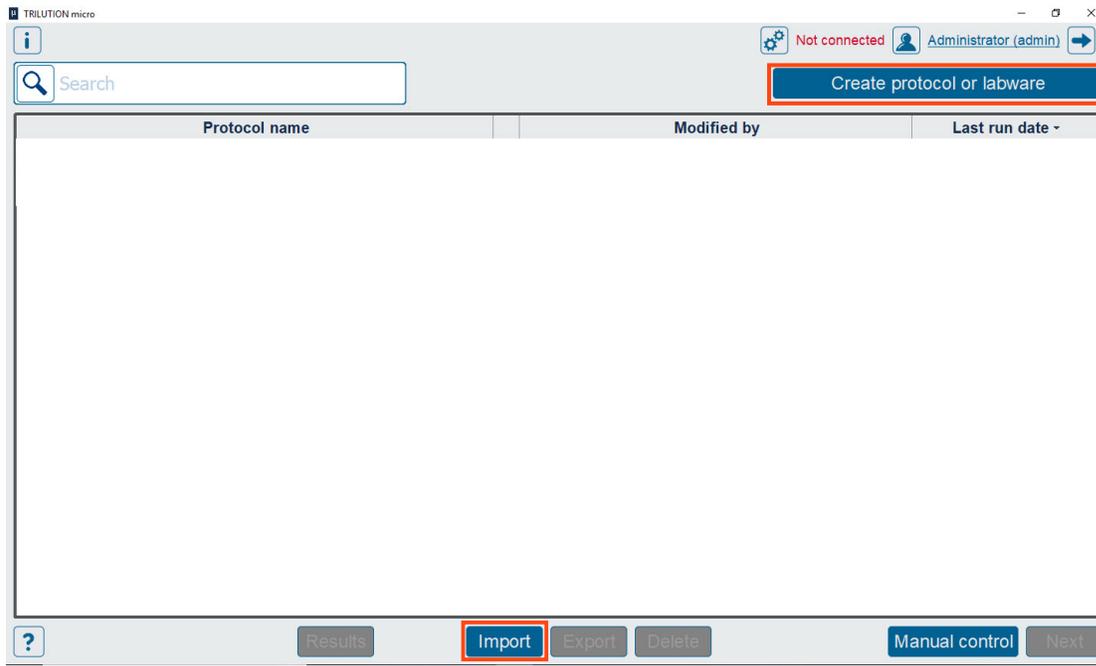
Build a Protocol List

Figure 15
Import Protocol or Create Protocol or Labware

Do either of the following:

- Import a protocol that was created in Protocol Builder.

  If your protocol file is on a USB drive, connect it to a USB on the PC, one of the USB ports on the front of PIPETMAX, or the middle USB host port on the rear panel. (The top USB port on the rear panel is not supported.)

  Select **Import**, then browse for and select a PIPETMAX protocol file (.sqlite). The file name may or may not match the name of the protocol, depending on how it was saved. Lastly, select **Open**. The imported protocol appears in the protocol list.

- Create protocols using Normalization Assistant or qPCR Assistant.

> **NOTE**
> It is necessary to import any labware needed to create the protocol. Labware will need to be exported/obtained from the source, which is likely Labware Creator. Obtain the files from the person who created them. For more information about Labware Creator and how to export labware, refer to the *Labware Creator User's Guide* (part number LT313126).

Add Pipette Heads

1. On the **Protocol Selection** screen, select ⚙ to access the Settings screen.

2. Select **Pipette heads**.

3. Do any of the following:

   - If using a tablet or PC equipped with a camera, select **Scan** and then select **Camera**. Optionally, **select the icon** to switch between the front and rear camera. When prompted, scan the barcode on the pipette head.

   - **Enter the values** from the Gilson Quality Control Report supplied with each pipette head.

   - Using the optional barcode scanner (ordered separately), select **Scan** and then **scan the barcode**.

4. Select **Save**.

5. Repeat for additional pipette heads. When finished adding heads, select **Back** to return to the **Settings** screen and then select **Back** again to return to the **Protocol Selection** screen.

Run Protocol

1. On the **Protocol Selection** screen, select a protocol in the list. It will highlight when selected.

   Select **Next**. The **Scanning** dialog appears while the software checks that the PIPETMAX is connected. If connected, the software goes to the next screen, which is the **Run setup** screen. If not connected, a message appears notifying you that you are not connected and asking if you want to simulate or check your cabling connections and try again to run.

Figure 16
Run Setup Screen

2. If there are variable(s) in the selected protocol without a default value, a screen with a list of variables is displayed automatically or you can modify the variable values by selecting **Variables**. The **Variables** screen displays a list of variables that must be satisfied before running the protocol.
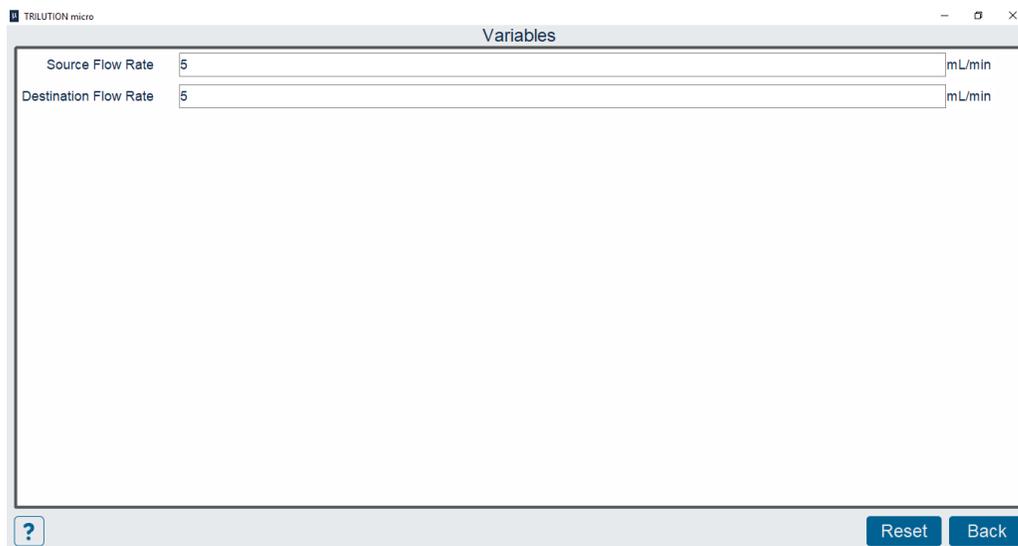

Figure 17
Variables Screen

3. Close the rotating cover or hood door. PIPETMAX will not operate with the cover or hood door open.
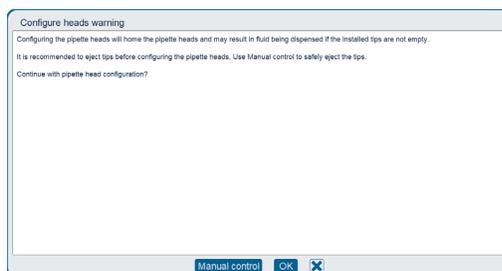
Install Pipette Heads

1. Select **Head setup** to go to the screen for selecting or adding pipette heads.

Figure 18
Pipette Heads Selected Do Not Match Pipette Heads Used in Protocol

2. Select **OK** to close the **Configure heads** warning message.

3. Open the rotating cover or hood door.

4. Install the tip ejector foot.

   If using a MAX8x20 or MAX8x200 pipette head, skip this step.

   If using the MAX1000 or MAX4x1200 pipette head, you ordered a tip ejector foot kit specific to the pipette head.
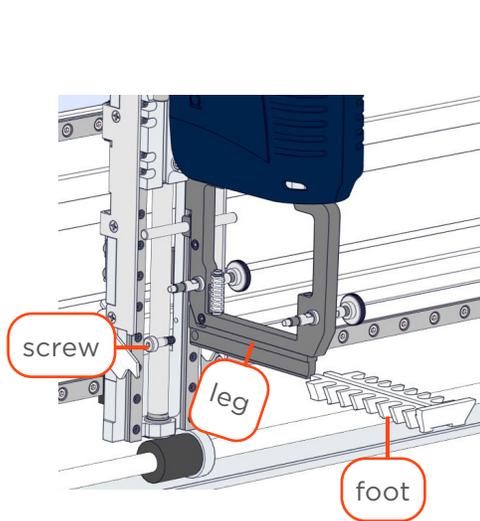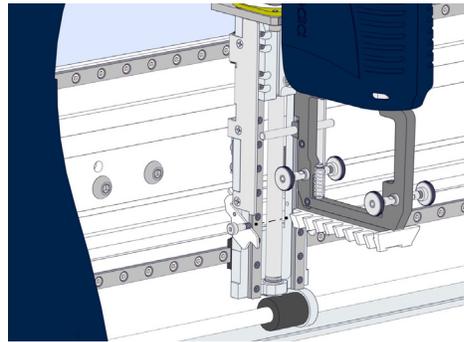

Figure 19
Tip Ejector Foot Components

Figure 20
Tip Ejector Foot Installation

   a. Using the supplied 3/32" hex wrench, remove the shoulder screw in the installed tip ejector foot.

   b. Remove the tip ejector foot.

   c. Slide the tip ejector foot onto the channel in the ejector leg.

   d. Use the supplied 3/32" hex wrench to start threading the shoulder screw, but do not fully tighten.

5. Install the pipette head(s) on the upper pipette head assembly using the thumb nuts. Ensure proper alignment of the pipette head against the upper pipette head assembly before tightening the thumb nuts.
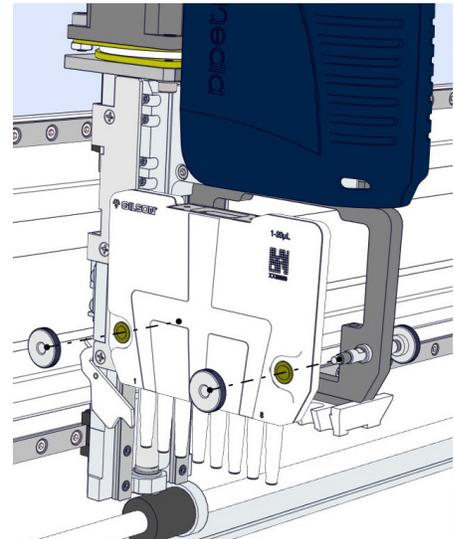

Figure 21
Pipette Head Installation

6. Finish tip ejector foot installation on a MAX1000 or MAX4x1200 pipette head. Manually move the tip ejector foot down to the bottom, and while holding it down, tighten the shoulder screw.
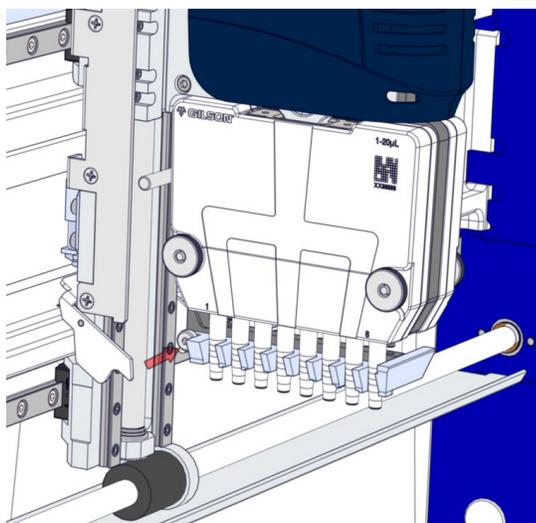

Figure 22
Tighten Shoulder Screw to Finish
Tip Ejector Foot Installation

7. Select the serial number of each installed pipette head.

    From the drop-down list below each pipette head image, select the serial number of the pipette head installed in each position (left and/or right). The software automatically filters pipette heads that have been added by type.

    Close the rotating cover or the hood door and then select **Back**. The software configures the pipette head(s) in PIPETMAX and returns to the **Run setup** screen.
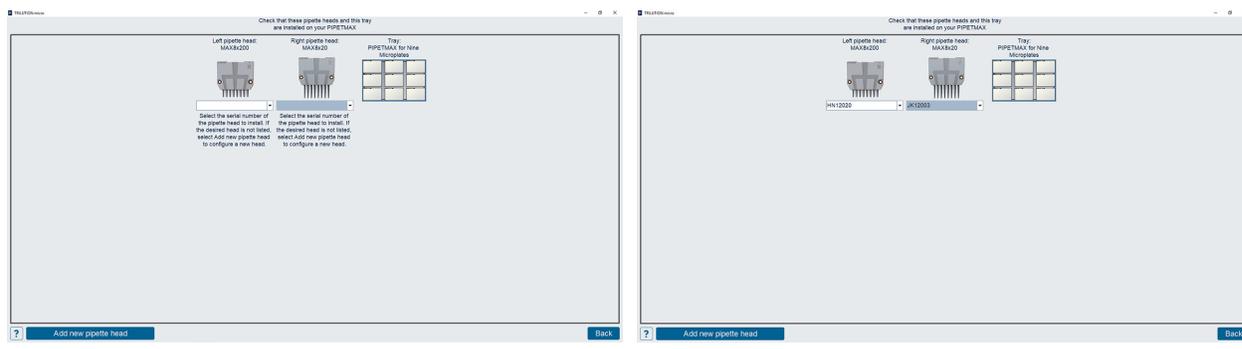

Figure 23
Head Setup Screen

Tip Rack Installation and Configuration

Select **Tip configuration**. The tray image in the upper left identifies the location of each tip rack and all labware.

1. Each tip rack consists of a rack of PIPETMAN® DIAMOND Tips and a tip reload block. To assemble the tip rack, first open the sealed BLISTER REFILL, lift the rack of tips out, and then set the rack of tips on the tip reload block. Ensure that the rack of tips is fully seated on the tip reload block. If using the PIPETMAX D1200 tip reload block (required when using D1200 PIPETMAN DIAMOND Tips and the MAX4x1200 head), press clips to open and then set the rack of tips on the tip reload block.
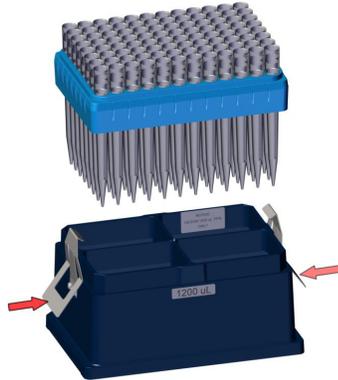

Figure 24
Tip Rack Assembly - Rack of
D1200 PIPETMAN® DIAMOND Tips
and D1200 Tip Reload Block
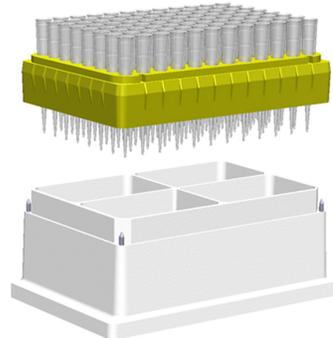
Figure 25
Tip Rack Assembly - Rack of
PIPETMAN® DIAMOND Tips
and Tip Reload Block

2. Remove the cover, if applicable.

3. Tip racks can only be placed in positions with installed clips. To install the tip rack, first loosen the thumbscrew for each clip, and then place the tip rack on the removable tray with the beveled corner in the back left corner.

4. Rotate each clip so that it will effectively secure the tip rack on the tray as shown in the image below.

Figure 26
Install Tip Rack on Tray

Figure 27
Clips Rotated Into Position to Secure Tip Rack on Tray

5. Tighten the thumbscrew for each clip.

6. Ensure that the illustration on-screen in TRILUTION micro matches your tip setup. The colors indicate the following information:

    White - Missing tips

    Pink - Tips

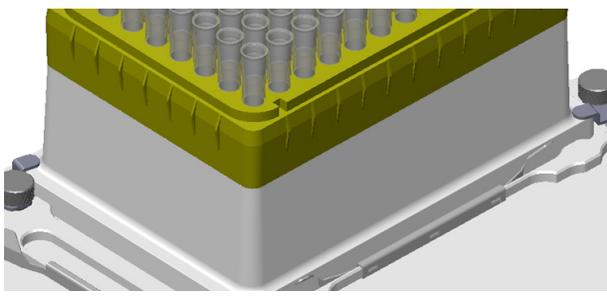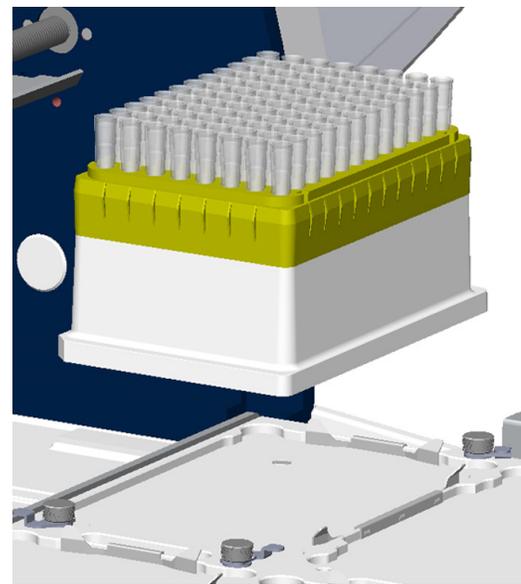7. Select in the **Tips missing, left** or **Tips missing, right** field and then specify the number of missing tips. The software will indicate missing tips starting from the bottom left corner for **Tips missing, left**. The software will indicate missing tips starting from the bottom right corner for **Tips missing, right**.
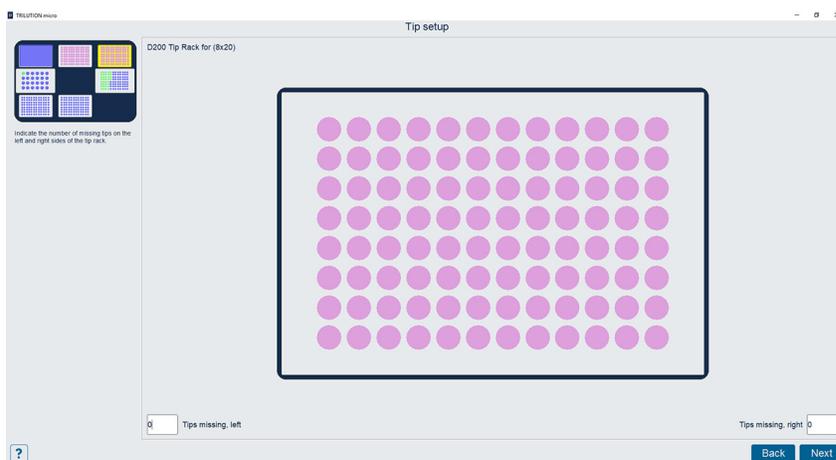
Figure 28
Tip Setup Screen

8. If your configuration uses multiple tip racks, select **Next** to advance to the next tip box on the bed. Select **Back** to return to the previously selected tip box. After configuring the last tip rack, select **Next** to return to the **Run Setup** screen.

    If your configuration has only one tip rack, select **Back** to return to the **Run Setup** screen.

CHANGING THE RACK OF TIPS DURING THE RUN

If prompted during the run to refill the tip rack, use two hands and lift carefully when removing the empty rack of tips from the tip reload block. Jarring movements could cause spillage of liquids from other racks.

TIP RACK REMOVAL

To remove the tip rack from the removable tray:

1. Loosen the thumbscrew for each clip.

2. Rotate each clip away from the tip reload block.

3. Lift the tip rack off the removable tray.

4. Remove the rack of tips from the tip reload block.

> **NOTE** If using the PIPETMAX D1200 tip reload box (required when using D1200 tips and the MAX4x1200 head), press to open the clips while removing the rack of tips from tip reload block.

Bed Setup

1. Select **Bed Setup**. The tip waste bin is displayed. The tray image in the upper left identifies the location of the bed elements.

2. Select **Next** to advance to the next bed element that is not a tip box. Select **Back** to return to the previously selected bed element.

    a. Ensure that the illustration matches your bed setup.

        When a bed element is selected, the tray image in the upper left identifies the current, selected bed element.

        If a well/tube is selected, it is highlighted red in the plate/rack image.

        ●   The initial volume list is displayed. Initial volume is the initial volume for the well or tube. The initial volumes are set to the default values defined in the protocol, but can be modified.

        ●   Well label is the name of the well or tube.

        ●   Location is the location of the well or tube on the labware. Type is the type of well (microplate, vial, etc.). The Location and type fields are not editable.

    b. After reviewing the last bed element, select **Next** to return to the **Run Setup** screen.

Run Protocol

Select **Run**. When prompted, it is recommended to simulate if this is the first time running the protocol.
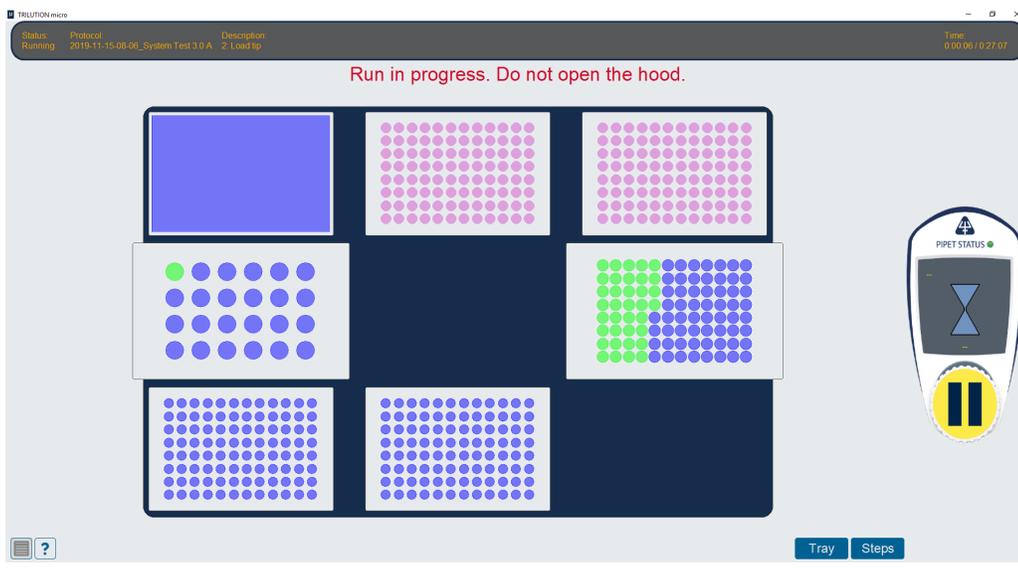
Figure 30
Run - Tray View

Chapter 4

MAINTENANCE

IN THIS CHAPTER

- Cleaning | 38
- Add or Replace Pipette Head(s) | 38
- Repair and Return Policies | 39

PIPETMAX® is designed to require a minimum level of maintenance.

Cleaning

Keep PIPETMAX clean for peak performance. Always turn the power off to PIPETMAX before cleaning. Wipe PIPETMAX with a soft cloth dampened with a mild detergent and disinfect as needed.

Add or Replace Pipette Head(s)

When adding or replacing pipette heads:

1. Remove the currently installed pipette head by removing the thumb nuts securing the pipette head to the upper pipette head assembly.

2. Add the pipette head to the software by scanning or entering the calibration values (refer to Add Pipette Heads on page 28).

3. Physically install the head on the instrument (refer to Install Pipette Heads on page 30).

Figure 31
Pipette Head Removal

Repair and Return Policies

Before Calling Us

Your local Gilson representative will be able to serve you more efficiently if you have the following information:
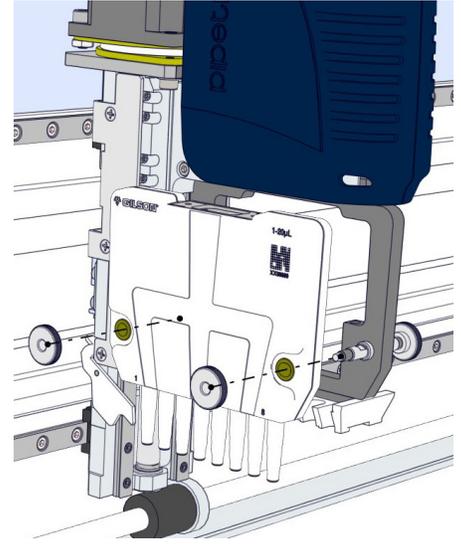
- The serial number and model number of the instrument(s) involved
  - The serial number for PIPETMAX, which is located on the inside panel of the right support.
  - The serial number for each pipette head, which is located on the document supplied with it.
- Installation procedure you used
- List of concise symptoms
- List of operating procedures and conditions you were using when the problem arose
- List of all instruments in the configuration and the connections to those instruments
- List of other electrical connections in the room

Warranty Repair

Units covered under warranty will be repaired and returned to you at no charge. If you have any questions about applicability, contact your local Gilson representative.

Non-Warranty Repair

For out-of-warranty repairs, contact your local Gilson representative who will discuss service options with you and can assist in making arrangements to return the equipment, if necessary.

Return Procedure

Contact your local Gilson representative to obtain authorization before returning any Gilson equipment. To return a piece of equipment:

- Carefully pack the unit to prevent damage in transit. Check with your local Gilson representative regarding proper method of shipment. No responsibility is assumed by Gilson or your local Gilson representative for damage caused by improperly packaged instruments. Indicate the authorization on the carton and on the packing slip.
- Always insure for the replacement value of the unit.
- Include a description of symptoms, your name, address, phone number, and purchase order to cover repair costs, return and shipping charges, if your institution requires it.

Unit End-of-Life

When a unit reaches the end of its useful life, refer to **www.gilson.com** for directions and information on the end-of-life policy. This is in accordance with the European Union Directive on Waste Electrical and Electronic Equipment (WEEE).
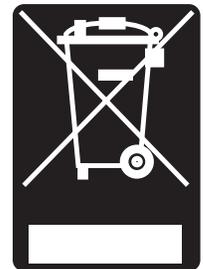
REPLACEMENT PARTS

PIPETMAX®

Part Number	Description
32100000	PIPETMAX WITH STANDARD COVER
32100001	PIPETMAX W/COVER CUTOUTS
32100002	PIPETMAX W/EXTERNAL SAFETY INTERLOCK

TRILUTION® micro Software

Part Number	Description
32000341	TRILUTION micro v3 INSTALLED ON TOUCHSCREEN TABLET
32000340	TRILUTION micro v3 ON USB DRIVE FOR PC INSTALL

Pipette Heads

Part Number	Description
FC10022	MAX8x20 PIPETTE HEAD
FC10021	MAX8x200 PIPETTE HEAD
FC10010	MAX1000 PIPETTE HEAD
FC10023	MAX4x1200 PIPETTE HEAD

Removable Trays

Part Number	Description
32000109	STANDARD 96-WELL TRAY
32000091	384-WELL TRAY

Tip Reload Block

Part Number	Description
32000175	PIPETMAX TIP RELOAD BLOCK
32000391	PIPETMAX D1200 TIP RELOAD BLOCK

Tip Ejector Feet

Part Number	Description
32000146	TIP EJECTOR FOOT DUAL 8 CH
32000284	EJECTOR FOOT KIT 8 & 1 CH
32000376	EJECTOR FOOT KIT 8 & 4 CH

BLISTER REFILL for PIPETMAX®-Certified 384-well

	Description	Volume Range	Tip Length	Qty/ Pack	Autoclavable Tips	Sterilized Tips
					Part Number	Part Number
BLISTER REFILL	DSL10 BLISTER REFILL 384-Certified	0.1–20 μL	45 mm	960	F172210	F172211
	DS200 BLISTER REFILL 384-Certified	2–200 μL	51 mm	960	F172310	F172311
	DS1000 BLISTER REFILL 384-Certified	100–1000 μL	66 mm	960	F172510	F172511
FILTER BLISTER REFILL	DSFL10ST BLISTER REFILL 384-Certified	0.1–10 μL	45 mm	960	-	F172213
	DSF30ST BLISTER REFILL 384-Certified	2–30 μL	51 mm	960	-	F172313
	DSF200ST BLISTER REFILL 384-Certified	20–200 μL	51 mm	960	-	F172513
	DSF1000ST BLISTER REFILL 384-Certified	100–1000 μL	66 mm	960	-	F172613

Standard PIPETMAN® DIAMOND Tips

	Description	Volume Range	Tip Length	Qty/ Pack	Autoclavable Tips	Sterilized Tips
					Part Number	Part Number
BLISTER REFILL	DL10 BLISTER REFILL	0.1–20 μL	45 mm	960	F172200	F172201
	D200 BLISTER REFILL	2–200 μL	51 mm	960	F172300	F172301
	D1000 BLISTER REFILL	100–1000 μL	66 mm	960	F172500	F172501
	D1200 BLISTER REFILL	100–1200 μL	84 mm	960	F172800	F172801

PIPETMAN® DIAMOND Filter Tips

	Description	Volume Range	Tip Length	Qty/Pack	Sterilized Tips	
					Part Number	
▮	DFL10ST BLISTER REFILL	0.1–10 µL	45 mm	960	F172203	
▮	DF30ST BLISTER REFILL	2–30 µL	51 mm	960	F172303	
▮	DF200ST BLISTER REFILL	20- 200 µL	51 mm	960	F172503	
▮	DF1000ST BLISTER REFILL	100–1000 µL	66 mm	960	F172603	
▮	DF1200ST BLISTER REFILL	100–1200 µL	84 mm	960	F172803	

BLISTER REFILL

Tip Waste Disposal

Part Number	Description
32000274	TIP DISPOSAL BIN
32000177	RISER FOR OFF BED TIP DISPOSAL

Racks

Part Number	Description
32000196	RACK CODE 496 PCR TUBES
32000198	RACK CODE 424 1.5-2.0 mL TUBE FLIP CAP
32000197	RACK CODE 425 0.5-2.0 mL TUBE SCREW CAP
32000201	RACK CODE 440 SBS TILT RACK 10 DEG

Passive Temperature (PT) Racks

Part Number	Description
32000232	RACK CODE 424 PT PSV TMP FLP CAP 1.5-2ML
32000200	RACK CODE 425 PT PSV TMP SCR CAP 0.5-2ML
32000233	RACK,CODE 410 PT PSV TMP FLAT PLATE
32000238	RACK CODE 496 PT PSV TMP 96 PCR TUBE

Circulating Temperature (CT) Racks

A Circulating Temperature rack requires a circulating bath (ordered separately), RACK CODE 410 CT CIR TMP FLAT PLATE (ordered separately, part number 32000208), INSTALL KIT CT CIR TMP (ordered separately, part number 32000193), and can be used with the following adapters:

Part Number	Description
32000262	ADAPTER 424 CT CIR TMP FLP CAP 1.5-2ML
32000261	ADAPTER 425 CT CIR TMP SCR CAP 0.5-2ML
32000260	ADAPTER 496 CT CIR TMP 96 PCR TUBE

Accessories

Part Number	Description
32000199	ORBITAL SHAKER
32000244	HAND HELD MICROSCAN 2D BARCODE READER
32000241	TABLET HOLDER

Miscellaneous

Part Number	Description
54210001	PIPETMAX 268 PLUG FOR BACK COVER
32000174	PIPETMAX ALIGNMENT HEAD
32000275	PIPETMAX 268 PIPETTE HEAD NUT (QTY 5) SET
32000012	USB A MALE-B MALE 2M BLK