platemaster®

User's Guide

EN

GILSON®

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Chapter 1

INTRODUCTION

PLATEMASTER® is a 96-channel manual pipetting system designed for laboratory applications using microplates. It can transfer liquids with high throughput, accuracy, and precision.

PLATEMASTER is ideal for high throughput applications as it can pipette 96 wells simultaneously and still be easy to use, based on the same working principle as a standard air-displacement pipette.

PLATEMASTER is suitable for a wide range of applications:

- Pipetting and providing master mixes for PCR/qPCR.
- Simultaneous processing of nearly all reaction steps in microplates (coating, starting, stopping, washing, etc.) for applications such as ELISA.
- Addition and removal of culture media.
- Plate replication in cell culture.
- Dropwise addition of solutions for crystallography.
- Plate replication in expression tests.
- Enhancement of existing automation: assay development and adaptation to 96-channel systems
- Back-up solution for maintenance and downtime.
- Workflows involving pipetting on a 96-well or 384-well scale.

Figure 1
Gilson PLATEMASTER® P20

Unpacking

Each PLATEMASTER configuration is shipped in one box.

- PLATEMASTER P20
(part number F110761) contains:

- PLATEMASTER P20
- User's guide
- 3 height adjusters
- 1 lubrication box
- 1 Allen ball head wrench 3.0 x 100 mm (for assembling and disassembling of the pipetting head)
- 1 transport box and packing material
- Gilson original certificate of conformity

- PLATEMASTER P220
(part number F110762) contains:

- PLATEMASTER P220
- User's guide
- 3 height adjusters
- 1 lubrication box
- 1 Allen ball head wrench 3.0 x 100 mm (for assembling and disassembling of the pipetting head)
- 1 transport box and packing material
- Gilson original certificate of conformity

Safety

PLATEMASTER is designed for research purposes only. If PLATEMASTER is used in a manner not specified by Gilson, the protection provided by the instrument may be impaired. Gilson will not be responsible for damages.

For all transportation, Gilson recommends removing the pipetting head from the base unit and using the original shipping box. For all moving, the head must be locked with the secure lock (refer to **Moving PLATEMASTER** on page 7).

For disassembly, please reverse the installation procedure (refer to **INSTALLATION** on page 5).

Temperature of use: 4°C to 40°C - Recommended working temperature: 20°C to 25°C

Use only the accessories provided.

Gilson SAS denies any responsibility for service and repairs carried out by the customer or third-party companies. Neither the equipment nor the filter tips installed can be autoclaved.

Gilson is not liable for any damage resulting from the use of PLATEMASTER.

Follow the instructions in this user's guide to ensure durability and top performance of your PLATEMASTER. Keep this manual handy for future reference, in accordance with good laboratory practices.

Chapter 2

INSTALLATION

Read this section carefully before installing and operating PLATEMASTER.

The instrument described in this user's guide should only be operated by qualified personnel in a laboratory or similar indoor environment.

Cleaning, installation, dismantling, maintenance, adjustment, and repair should be performed by appropriately trained personnel who are aware of the hazards involved.

If a spill occurs, refer to the material safety data sheet (MSDS) provided by the chemical manufacturer before cleaning up the spill and take all safety precautions required.

1. Remove PLATEMASTER pipetting head and PLATEMASTER base from box.

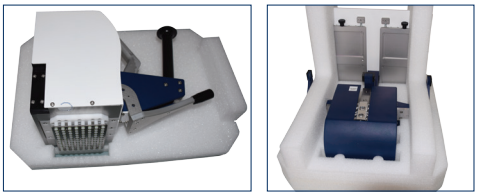


Figure 2
Unpacking PLATEMASTER® head and base

NOTE	**Keep the packaging!** **It will be useful for sending the device for any maintenance and calibration.**

2.

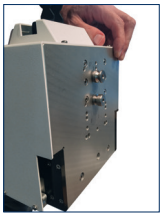


Figure 3
Location studs on head

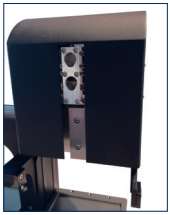


Figure 4
Sockets for location studs on base

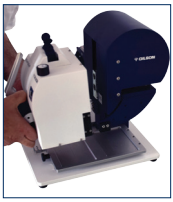


Figure 5
Insert the location studs into the sockets

3. Insert the pipetting head as follows and secure the head by screwing the first screw down.

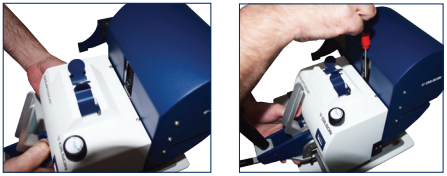
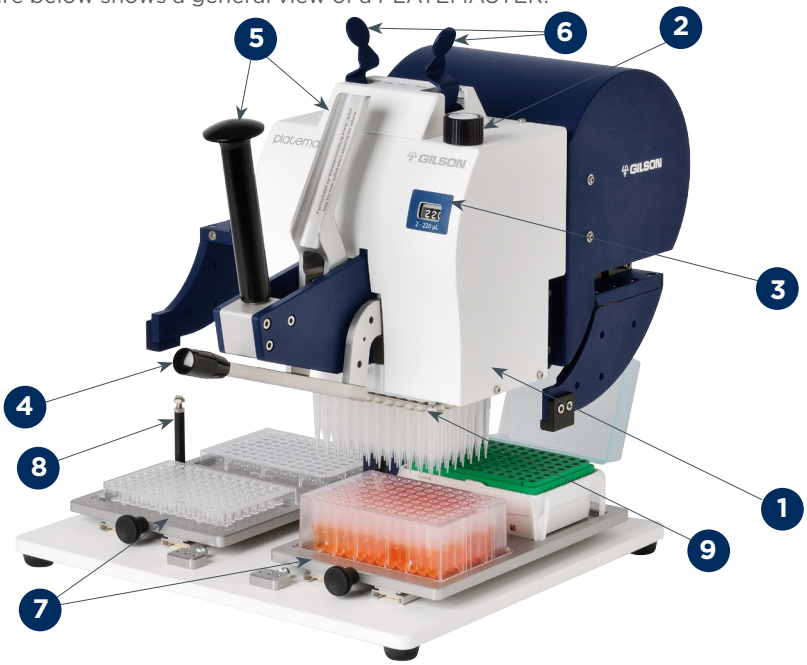


Figure 6
Pull the head down a little and turn the screw to the lower stop

General View

The figure below shows a general view of a PLATEMASTER.



1. Pipetting head
2. Volume adjustment wheel
3. Volume display
4. Tip fitting handle
5. Pipetting handle
6. Tip ejector
7. Movable drawers
8. Pipetting head height adjuster
9. Pin-plate

Figure 7
PLATEMASTER® parts

Technical Data

MODEL	PLATEMASTER P20	PLATEMASTER P220
Part Number	F110761	F110762
Volume Range	0.5 to 20 µL Volume can be adjusted in 0.1 µL increments	2 to 220 µL Volume can be adjusted in 1 µL increments
Temperature Range	Recommended working temperature: 20°C to 25°C / 68°F to 77°F	
Dimensions	300 x 450 x 400 mm / 12 x 18 x 16 Inch (W x L x H)	
Weight	approx. 16 kg / approx. 35 lbs.	

Chapter 3

OPERATION

Description

The pipetting head moves both vertically and horizontally. Vertical movements are made to fit tips and pipette liquid. Horizontal movements are made to transfer liquids. This movement is possible only when the head is fully raised.

Two drawers can hold up to three different microplates and can be used at the same time.

Moving PLATEMASTER

Whether placed on the lab bench, under a fume hood, in a cold room, or used in the field, the PLATEMASTER is completely portable. The PLATEMASTER includes a locking device to lock the head when the instrument is being moved.

After each use of the PLATEMASTER, remember to lock the pipetting head to prepare for transport.

To lock the pipetting head, pull the black part on the left side of the PLATEMASTER, lower the head, and turn the black part until the notch is in the slot. Let the head slowly ride up and be locked.

Figure 8
PLATEMASTER® lock

To unlock the pipetting head, pull the black part and turn it. Once the pipetting head is released, check proper movement of the device.

NOTICE

Never move the device without locking the pipetting head.
Damages caused by movement without locking the device will not be covered by the warranty.

Height Adjuster

The descent of the pipetting head and the position of the tips can be adjusted by means of three height adjusters 1.

This will prevent the tips from touching the bottom of the microplate and can be adjusted for use with shallow- or deep-well microplates.

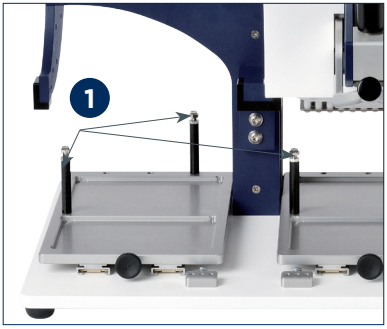


Figure 9
Three height adjusters positions

Volume Setting

Do not adjust the volume without squeezing both parts of the pipetting handle 1 .

The volume of liquid to be aspirated is set using the volume adjustment wheel 2 .

With the pipetting handle fully squeezed, the volume is set by slowly turning the volume adjustment wheel to reach the required setting.

Never try to force the volume outside of the volume range permitted by the device.

Tip Fitting

For optimum performance, use of PIPETMAN® DIAMOND Tips with PLATEMASTER is strongly recommended. Plastic tips are for a single use and should not be cleaned for reuse.

To fit PIPETMAN® DIAMOND Tips on PLATEMASTER:

- Raise the pipetting head vertically using the pipetting handle. Move the pipetting head 1 to the left side.
- Slide the right drawer out 2 and place a new tip rack on the back position. The four locations have been specially designed for PIPETMAN DIAMOND Tips TIPACK™. **Slots embedded in the drawers ensure that tip racks securely fit into all locations.**
- Use the pipetting handle 3 to position the pipetting head 1 to the right and lower it far enough so that a contact is made with the tips in the rack.
- Press down on the tip fitting handle 4 with moderate pressure. The tip ejector must be fully expanded to ensure that the tips are fully attached 5 .
- Move the pipetting head 1 up and the right drawer 2 back.

The device is now ready to pipette liquid.

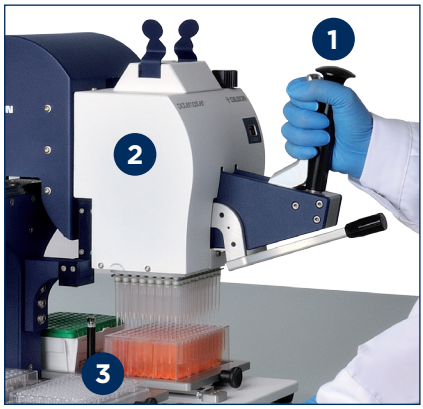
Pipetting

Place a vessel containing the solution to be pipetted in the front location of the right drawer. The solution should be under the pipetting head.

Liquids containing protein solutions and organic solvents can leave a film of liquid on the inside wall of the tip; pre-rinse the tip to minimize any errors related to this phenomenon. Pre-rinsing consists of aspirating the first volume of liquid and then dispensing it back into the same vessel (or to waste). Subsequent volumes pipetted will have levels of accuracy and precision within specifications. As recommended by the ISO 8655 standard, pre-rinse to stabilize dead volume inside the pipetting head.

ASPIRATION

- Gently squeeze the pipetting handle **1** **to the first stop** (this corresponds to the set volume of liquid).
- Use the pipetting handle **1** to lower the pipetting head **2** to immerse the tips in the liquid (see immersion depth table below). **It is important that the tips do not touch the bottoms of the wells.**
- Slowly retract the pipetting handle to aspirate the liquid into the tips.
- Move the pipetting head fully up.



To simplify this operation, the height adjuster **3** can be set by turning the upper screw so that the pipetting head may only be moved down to a position slightly above the bottom.

NOTE

Check the tip ejector when fitting tips. If the tips have shifted this implies that they have not been fitted correctly.

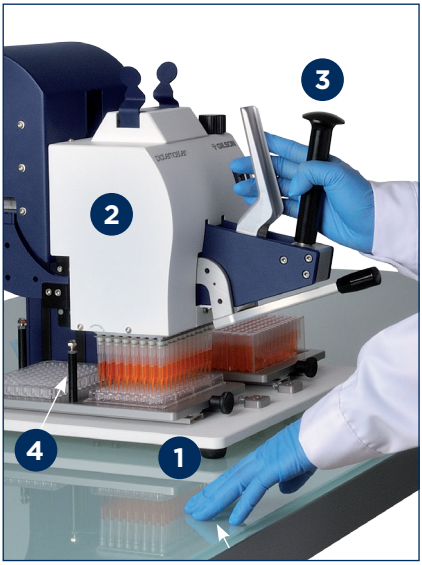
MODEL	IMMERSION DEPTH (MILLIMETERS)	WAIT TIME (SECONDS)
P20	2-3	1
P220	2-4	1

NOTE

The maximum immersion depth of the tips can be adjusted using a height adjuster.

DISPENSING

- Place a 96-well microplate at the front location of the left drawer 1 and keep it fully retracted in the rear position.
- Move the pipetting head 2 to the left and align the tips with the microplate.
- Pull the pipetting head slowly down into the wells, but do not touch the bottom of the wells.
- Squeeze the pipetting handle 3 slowly to dispense all the solution.
- Pull the pipetting head slowly up with the pipetting handle fully squeezed.
- Gently retract the pipetting handle.
- To simplify this operation, a height adjuster 4 can be set by turning the upper screw so that the pipetting head may only be moved down to a position slightly above the bottom.



Pipetting 384 wells

PLATEMASTER is able to load 384-well plates through four movements using the 384-well plate adapter.

STEP 1:

- Place a 384-well microplate on the accessory and make sure that it is located at the first step by checking the position on the blue wheel.
- Aspirate the solution.
- Move the pipetting head over the microplate and dispense the first 96 wells.

STEP 2:

- Move the microplate on to the second position of the 384-well plate adapter using the blue wheel.
- Aspirate the solution. Move the pipetting head over the microplate and dispense the next 96 wells.

STEP 3:

- Move the microplate on to the third position of the 384-well plate adapter using the blue wheel.
- Aspirate the solution. Move the pipetting head over the microplate and dispense 96 wells.

STEP 4:

- Move the microplate on to the fourth position of the 384-well plates adapter using the blue wheel.
- Aspirate the solution. Move the pipetting head over the microplate and dispense the last 96 wells.

The 384-well microplate is loaded in less than one minute requiring only four liquid aspiration steps.

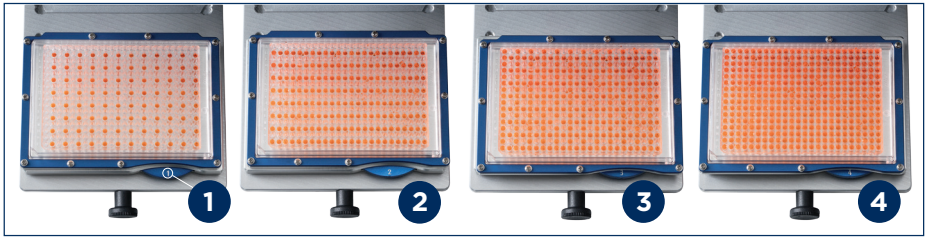


Figure 10
384-well adapter system

Tip Ejection

- Move the pipetting head over the empty rack on the right drawer.
- Pull the pipetting head down to put the used tips into the original rack (tip rack will be reused as a receptacle for tip waste).
- Squeeze the tip ejector 1 at the top of the pipetting head to eject the tips into the rack.

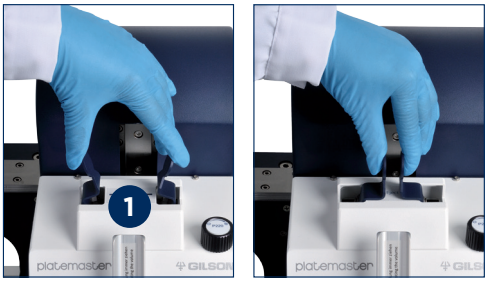


Figure 11
Tip ejection system

General Guidelines for Good Pipetting

Place the PLATEMASTER in a dry and clean environment at the recommended ambient temperature of 20°C to 25°C. These conditions should stay constant, as significant variations in temperature or humidity may affect precision.

PLATEMASTER is completely portable and requires no electricity; it can be operated everywhere in the lab. When the device has been moved, allow some equilibration time for the instrument to adjust to the new ambient conditions.

Make sure that you operate the pipetting handle slowly and smoothly. Aspirating too quickly may cause drops to form inside the tips. Dispensing too quickly can cause carryover. Pipetting speed will depend on the type of liquid used.

Never allow any liquid to enter the pin-plate (see Figure 14, page 15). This phenomenon can be prevented by squeezing and retracting the pipetting handle slowly and gently.

Change the tips before aspirating a different liquid, sample, or reagent.

Each new tip should be pre-rinsed with the liquid to be pipetted.

Do not pipette liquids having temperatures above 70°C or below 4°C. PLATEMASTER can be used between + 4°C and + 40°C, but specifications may vary according to temperature (refer to the ISO 8655-6 standard for conditions of use).

NOTE

Pipetting aggressive liquids may damage PLATEMASTER parts that contact the solution. In case of contact, immediately clean up aggressive liquids. Pipetting of extremely viscous or highly evaporating liquids is at your own risk. The same applies to aggressive and corrosive reagents.

Avoid aspiration of any liquid into the pin-plate.

Chapter 4

ACCESSORIES

DESCRIPTION	PART NUMBER
Adapter 384-well. Positioning done by wheel.	F1077602
Adapter 384-well. Positioning done by hand.	F1077603
Alu-heater block for PLATEMASTER, 96 x 0.2 mL, for PCR tubes, stripes & PCR plates ∅ 7.8 mm	F1077604
Pipetting head height adjuster	F1077605
Lubrication box of O-rings PLATEMASTER	F077606

Figure 12
F1077602 — Adapter 384-well, positioned by wheel

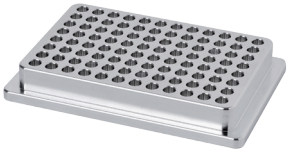


Figure 13
F1077604 — Alu-heater block

Chapter 5

ASSOCIATED TIPS

For optimum performance, use of PIPETMAN® DIAMOND Tips with PLATEMASTER is strongly recommended. Using PIPETMAN DIAMOND Tips helps prevent damage to the pin-plate (see Figure 14, page 15).

STANDARD TIPS	STERILIZED TIPS	STERILIZED FILTER TIPs
PLATEMASTER P20 (0.5 — 20 µL)		
		DF100ST
D200	D200ST	DF200ST
DS200*	DS200ST*	DFS200ST*
PLATEMASTER P220 (2 — 220 µL)		
D200	D200ST	DF200ST
DS200*	DS200ST*	DFS200ST*
D300	D300ST	DF300ST

*Validated for use with 384-well plates.

PIPETMAN DIAMOND Tips DL10, DL10ST, DSL10*, and DSL10ST could be used under a specific product configuration. For more information, please contact David Edwards, Product Manager, at dedwards@gilson.com

All used consumables are tested on the specific volume ranges of PLATEMASTER.

SERVICE

GLP Features

The **serial number** is engraved on the back of the pipetting head. It provides unique identification of your PLATEMASTER and the date of manufacture.

The **certificate of conformity** provides traceability of your PLATEMASTER.

Cleaning and Decontamination

Do not use corrosive and acid reagents to clean or decontaminate PLATEMASTER.

PLATEMASTER must be cleaned before it is decontaminated. Wipe the surface of the instrument with alcohol or laboratory disinfectant.

The PLATEMASTER surface can be cleaned with a soft tissue moistened with water or laboratory disinfectant.

Do not expose PLATEMASTER to excessive UV radiation and never overnight.

Do not autoclave any part of PLATEMASTER.

Material in Contact with Liquids or Vapors

FKM (Fluoroelastomers), EPDM (ethylene propylene diene monomer), PP (Polypropylene), POM (Polyoxymethylene), PET (Polyethylene terephthalate), Silicone, Stainless steel, Anodized aluminium.

Use of the Lubrication Box

In case of intensive use between each maintenance interval and to avoid bad tip fitting, it is recommended to lightly lubricate the external O-ring using the lubrication box (part number F1077606).

Proceed as follow :

- Open the box lid.
- Follow the “Tip Fitting” instructions (refer to Tip Fitting on page 8).
- Eject the tips.

Figure 14
Pin-plate

The O-ring lubrication is complete.

Using a no-fiber wipe, remove any excess lubricant on the pin-plate.

Chapter 7

SPECIFICATIONS

PLATEMASTER is a high quality 96-channel manual pipetting system that offers excellent accuracy and precision. The values given in the “Gilson maximum permissible errors” table below were obtained using PIPETMAN DIAMOND Tips. These values are guaranteed only when genuine PIPETMAN DIAMOND Tips are used.

PLATEMASTER P20 is certified with PIPETMAN DIAMOND Tips D200.

PLATEMASTER P220 is certified with PIPETMAN DIAMOND Tips D300.

Each PLATEMASTER is inspected and validated by qualified technicians in accordance with the Gilson Quality System.

The adjustment is carried out under strictly defined and monitored conditions (ISO 8655-6).

Gilson Maximum Perimissible Errors

VOLUME*		GILSON		ISO 8655	
		SYSTEMATIC ERROR	RANDOM ERROR	SYSTEMATIC ERROR	RANDOM ERROR
PLATEMASTER P20 (0.5 — 20 µL) **(P/N F110761)**					
Min	1	±0.12	≤0.1	±0.4	≤0.20
	10	±0.12	≤0.1	±0.4	≤0.20
Max	20	±0.2	≤0.18	±0.4	≤0.20
PLATEMASTER P220 (2 — 220 µL) **(P/N F110762)**					
Min	2	±0.12	≤0.015	±8.0	≤3.0
	5	±0.25	≤0.175	±8.0	≤3.0
	20	±0.4	≤0.3	±8.0	≤3.0
	100	±1	≤0.6	±8.0	≤3.0
	200	±1.6	≤0.8	±8.0	≤3.0
Max	220	±1.8	≤0.8	±8.0	≤3.0

*All Values in Microliters

Chapter 8

WARRANTY

Gilson warrants this device against defects in material under normal use and service for a period of 12 months from the date of purchase.

This warranty shall not apply to devices which are subject to abnormal use and/or improper or inadequate maintenance (limited to the recommendations given in the user's guide), including, but not limited to devices which have been subjected to physical damage, improper handling, spillage or exposure to any corrosive environment. This warranty shall also be void in the event devices are altered or modified by any party other than Gilson or its designates. Gilson's sole liability under this warranty shall be limited to, at Gilson's sole option, repair or replacement of any defective components of devices or refund of the purchase price paid for such devices.

THE FOREGOING WARRANTY IS EXCLUSIVE AND GILSON HEREBY DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND ANY WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, UNDER NO CIRCUMSTANCES SHALL GILSON BE LIABLE FOR ANY CONSEQUENTIAL, PUNITIVE, INDIRECT OR INCIDENTAL DAMAGES ARISING OUT OF ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTY.

NOTES

NOTES

Specifications subject to change without notification - errors excepted.

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