pipetman®

CLASSIC

User's Guide

EN

NOTICE

Do not lubricate this pipette. The use of lubricant cancels the warranty of this pipette.

GILSON®

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Chapter 1

INTRODUCTION

The Pipetting Standard – Gilson's PIPETMAN® Classic is designed and manufactured to provide you with a range of robust, accurate, and precise pipettes.

The PIPETMAN Classic is a fully adjustable, air-displacement pipette with the selected volume shown on a digital indicator (volumeter).

Eight models cover a range from 0.2 µL to 10 mL, for many applications:

- **P2 and P10**: measurement and transfer of micro-volumes, DNA sequencing, and enzyme-assays.
- **P20, P100, P200, P1000**: measurement and transfer of general aqueous solutions, acids, and bases.
- **P5000, P10mL**: measurement and transfer of large volumes.

Parts Checklist

After unpacking the pipette, verify that the following items were included and are undamaged:

- PIPETMAN Classic
- *PIPETMAN® Classic User's Guide*
- Safety Bag
- Certificate of Conformity (including barcode sticker)

GLP Features

The **serial number** is engraved on the body of the pipette. It provides unique identification of your pipette and the date of manufacture;
Ex: AA 10369

The **barcode** on the box and the certificate of conformity provide traceability of your pipette.

Figure 1
Serial Number Location

Description

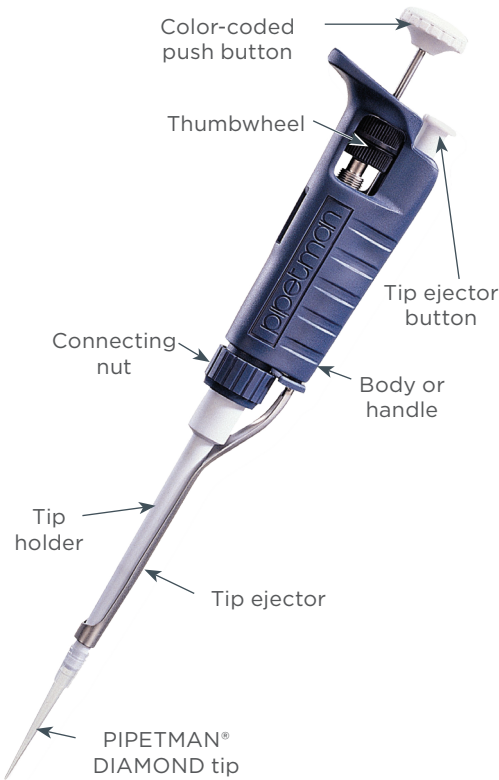

Figure 2
PIPETMAN® Classic

Specifications

PIPETMAN Classic is a high quality pipette that offers excellent accuracy and precision. The values provided in the **Maximum Permissible Errors** tables were obtained using PIPETMAN® DIAMOND tips. These values are guaranteed only when genuine PIPETMAN® DIAMOND tips are used.

Each pipette is inspected and validated by qualified technicians in accordance with the Gilson Quality System. Gilson declares that its manufactured pipettes comply with the requirements of the ISO 8655 standard by type testing. The adjustment is carried out under strictly defined and monitored conditions (ISO 8655-6).

Maximum Permissible Errors

The data provided in the following tables conform to the ISO 8655-2 Standard. With a precise pipetting technique (refer to **Guidelines for Good Pipetting** on page 9) the P2 model may be used to aspirate volumes as low as 0.1µL and the P10 model as low as 0.5 µL.

VOLUME*		GILSON		ISO 8655	
		SYSTEMATIC ERROR	RANDOM ERROR	SYSTEMATIC ERROR	RANDOM ERROR
P2 WITH D10 OR DL10 TIPS (P/N F144801)					
Min	0.2	±0.024	≤0.012	±0.08	≤0.04
	0.5	±0.025	≤0.012	±0.08	≤0.04
Max	2	±0.030	≤0.014	±0.08	≤0.04
P10 WITH D10 OR DL10 TIPS (P/N F144802)					
Min	1	±0.025	≤0.012	±0.12	≤0.08
	5	±0.075	≤0.030	±0.12	≤0.08
Max	10	±0.100	≤0.040	±0.12	≤0.08
P20 WITH D200 TIPS (P/N F123600)					
Min	2	±0.10	≤0.03	±0.20	≤0.10
	5	±0.10	≤0.04	±0.20	≤0.10
	10	±0.10	≤0.05	±0.20	≤0.10
Max	20	±0.20	≤0.06	±0.20	≤0.10
P100 WITH D200 TIPS (P/N F123615)					
Min	20	±0.35	≤0.10	±0.80	≤0.30
	50	±0.40	≤0.12	±0.80	≤0.30
Max	100	±0.80	≤0.15	±0.80	≤0.30
P200 WITH D200 OR D300 TIPS (P/N F123601)					
Min	50	±0.50	≤0.20	±1.60	≤0.60
	100	±0.80	≤0.25	±1.60	≤0.60
Max	200	±1.60	≤0.30	±1.60	≤0.60
P1000 WITH D1000 OR D1200 TIPS (P/N F123602)					
Min	200	±3	≤0.6	±8	≤3.0
	500	±4	≤1.0	±8	≤3.0
Max	1000	±8	≤1.5	±8	≤3.0
P5000 WITH D5000 TIPS (P/N F123603)					
Min	1000	±12	≤3	±40	≤15
	2000	±12	≤5	±40	≤15
Max	5000	±30	≤8	±40	≤15
P10ML WITH D10ML TIPS (P/N F161201)					
Min	1	±30	≤6	±60	≤30
	2	±30	≤6	±60	≤30
	5	±40	≤10	±60	≤30
Max	10	±60	≤16	±60	≤30

*All Values in Microliters

Chapter 2

SETTING THE VOLUME

The volume of liquid to be aspirated is set using the volumeter. The dials are colored either black or red to indicate the position of the decimal point, depending on the model (see examples).

The volume is set by turning the thumbwheel or the push button. The push button makes it easier and quicker to set volumes, especially when wearing gloves. The thumbwheel may be turned to slowly reach the required setting.

To obtain maximum accuracy when setting the volume:

- When **decreasing** the volume setting, slowly reach the required setting, making sure not to pass the setting.
- When **increasing** the volume setting, pass the required value by 1/3 of a turn and then slowly decrease to reach the volume, making sure not to pass the setting.

Figure 3
Dial Colors by Model

Figure 4
Location of Push Button and Thumbwheel

MODEL	COLOR OF VOLUMETER NUMBERS		
	BLACK	RED	INCREMENT
P2	µL	0.01 µL	0.002 µL
P10 to P20	µL	0.1 µL	0.02 µL
P100–P200	µL	—	0.2 µL
P1000–P5000	0.01 mL	mL	0.002 mL
P10mL	mL	0.1 mL	0.02 mL

Chapter 3

PIPETTING

While many brands of tips can be used with the PIPETMAN® Classic, it is recommended to use PIPETMAN® DIAMOND for optimum performance. These tips, made from pure polypropylene have the Gilson logo engraved on their collar, ensuring that you have a genuine Gilson product. Plastic tips are for a single application—they must not be cleaned for reuse.

PIPETMAN Classic can also be used with the main tip brands.

Fit the Tips

To fit a new PIPETMAN DIAMOND tip, push the tip holder into the tip using a slight twisting motion to ensure a firm and airtight seal.

NOTE	**For the P2 and P10 models, a dual-position adapter (plastic) is required to fit DL10 tips (long tips) or D10 tips (short tips). The metallic rod of the tip ejector is shaped so that the adapter may be clipped to it in either position.**

P2 and P10 models are delivered with the adapter in place, positioned in the longer slot, and ready to use DL10 tips. When D10 tips (which are shorter) are used, the adapter must be repositioned in the shorter slot as follows:

1. Pull the adapter down from the metallic rod.
2. Turn the adapter 180°.
3. Refit the adapter so that the end of the metallic rod engages the shorter slot of the adapter.

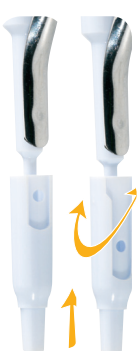

Figure 5
Dual-Position Adapter for P2 and P10

Pre-Rinse the Tips

Some liquids (e.g., protein-containing 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 that may be related to this phenomenon.

Pre-rinsing consists of aspirating the first volume of liquid and then dispensing it back to waste. Subsequent volumes that you pipette will have levels of accuracy and precision within specifications.

Aspirate

1. Press the push button to the **first stop** (this corresponds to the set volume of liquid).
2. Hold the pipette vertically and immerse the tip in the liquid (refer to **Guidelines for Good Pipetting** on page 9). Release the push button slowly and smoothly (to top position) to aspirate the set volume of liquid. Wait one second, the time depends on the model (refer to the table), then withdraw the pipette tip from the liquid. You may wipe any droplets away from the outside of the tip using a medical wipe; however, if you do so, take care to avoid touching the tip's orifice.

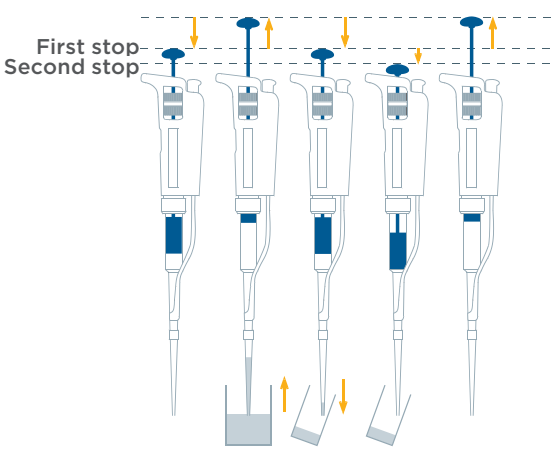

Figure 6
Pipetting Motion - Aspirate and Dispense

Dispense

1. Place the end of the tip against the inside wall of the recipient vessel (at an angle of 10° to 40°).
2. Press the push button slowly and smoothly to the **first stop**.
3. Wait for at least a second, then press the push button to the **second stop** to expel any residual liquid from the tip. Keep the push button pressed fully down and (while removing the pipette) draw the tip along the inside surface of the vessel.
4. Release the push button smoothly. Eject the tip by pressing firmly on the tip of the ejector button.

Guidelines for Good Pipetting

MODEL	IMMERSION DEPTH (MILLIMETERS)	WAIT TIME (SECONDS)
P2	1	1
P10	1	1
P20	2–3	1
P100	2–4	1
P200	2–4	1
P1000	2–4	2–3
P5000	3–6	4–5
P10mL	5–7	4–5

1. Make sure that you operate the push button slowly and smoothly.
2. When aspirating, keep the tip at a constant depth below the surface of the liquid (refer to the table).
3. Change the tip before aspirating a different liquid, sample, or reagent.
4. Change the tip if a droplet remains at the end of the tip from the previous pipetting operation.
5. Each new tip should be pre-rinsed with the liquid to be pipetted.

6. Liquid should never enter the tip holder; to prevent this:
   - press and release the push button slowly and smoothly,
   - never turn the pipette upside down,
   - never lay the pipette on its side when there is liquid in the tip.
7. If you use the same tip with a higher volume, pre-rinse the tip.
8. For volatile solvents you should saturate the air cushion in your pipette by aspirating and dispensing the solvent repeatedly before aspirating the sample.
9. When the temperature of the liquid is different from the ambient temperature, pre-rinse the tip several times before use.
10. You may remove the tip ejector (refer to **Changing the Tip Ejector** on page 15) to aspirate from very narrow tubes.
11. After pipetting acids or other corrosive liquids that emit vapors, remove the tip holder, rinse the piston, O-ring, and seal with distilled water. For the P1000 model, use a specific tip holder equipped with a filter to increase the lifetime of the piston (refer to **ACCESSORIES** on page 11).
12. Do not pipette liquids with temperatures above 70 °C or below 4 °C. The pipette can be used between + 4 °C and + 40 °C but the specifications may vary according to the temperature (refer to the ISO 8655-2 standard for conditions of use).

Chapter 4

ACCESSORIES

To make pipetting more comfortable and more secure, Gilson has developed several accessories:

Pipette stands allow users to store pipettes vertically to avoid the possibility of liquid running back into the pipette.

DESCRIPTION	PART NUMBER
CARROUSEL™ Pipette stand (7 pipettes)	F161401
TRIO™ stand (3 pipettes)	F161405
SINGLE™ pipette holder	F161406

To identify or personalize your pipette, Coloris™ clips are available:

DESCRIPTION	PART NUMBER
COLORIS™ clips (mixed colors set of 10)	F161301
COLORIS™ clips (red, set of 10)	F161302
COLORIS™ clips (yellow, set of 10)	F161303
COLORIS™ clips (green, set of 10)	F161304
COLORIS™ clips (blue, set of 10)	F161305
COLORIS™ clips (white, set of 10)	F161306

With The JIMMY™, hands free microtube opener, you can open both snap-cap and screw-cap microtubes.

DESCRIPTION	PART NUMBER
THE JIMMY™ (set of 3)	F144983

To protect the piston when pipetting corrosive liquids, you can use a specific tip holder and filter for the model P1000:

DESCRIPTION	PART NUMBER
Corrosion protection kit (tip holder + a bag of 10 filters)	F144570

Chapter 5

TROUBLESHOOTING

A quick inspection of the pipette may help you to detect a problem.

NOTE	**You may download the *2 Minute Inspection* from the Gilson website (www.gilson.com), which shows how to perform a quick diagnosis of your pipette.**

⚠WARNING	**Before returning any pipette to your local Gilson Service Center, ensure that it is completely free of chemical, biological, or radioactive contamination. Refer to Cleaning and Decontamination on page 18. Please use the included safety bag to return the pipette to your local Gilson Service Center.**

Troubleshooting Table

The following table may help you to identify and correct the problem you might encounter.

SYMPTOM	POSSIBLE CAUSE	ACTION
Pipette is leaking sample	Damaged tip holder	Replace the tip holder
	Worn O-ring or seal	Replace both parts
Pipette won't aspirate	Worn O-ring	Replace both parts
	Damaged tip holder	Replace the tip holder
	Connecting nut is loose	Tighten connecting nut
	Damaged or corroded piston	Return pipette to supplier
	Improper repair or assembly	Refer to page 15

SYMPTOM	POSSIBLE CAUSE	ACTION
Pipette is inaccurate	Improper repair or assembly	Refer to page 15
	Unscrew tip holder	Tighten connecting-nut
	Connecting nut is loose	Tighten connecting-nut
Pipette is not precise	Tip holder is loose	Tighten connecting nut
	Connecting nut is loose	Tighten connecting nut
	Incorrect operator technique	Operator training
	Damaged or corroded piston	Return pipette to supplier
	Damaged tip holder	Replace the tip holder
	Worn O-ring or seal	Replace both parts
Tips fall off or do not fit correctly	Low quality tips	Use PIPETMAN DIAMOND tips
	Damaged tip holder	Replace the tip holder
	Damaged tip ejector	Replace tip ejector
	Ejector spacer is missing	Mount the spacer on the tip ejector
	The ejector spacer is damaged	Replace the ejector spacer
	The tip ejector is loose	Assemble the tip ejector properly
	The ejector lock is misaligned	Align the ejector lock

However, if you can't solve the problem, contact your Gilson representative.

Leak Test

This test may be performed at any time to check that the pipette does not leak, especially after performing a maintenance or decontamination procedure. If a pipette fails this test, replace the O-ring and seal. After making sure that the pipette is correctly reassembled, repeat this test.

P2 to P200 Models

1. Fit a PIPETMAN® DIAMOND tip.
2. Set the pipette to the maximum volume, given in the specifications, and pre-rinse.
3. Aspirate the set volume from a beaker of distilled water.
4. Maintain the pipette in the vertical position and wait for 20 seconds.
5. If a water droplet appears at the end of the tip, there is a leak.
6. If you see no droplet, re-immerse the tip below the surface of water.
7. The water level inside the tip should remain constant; if the level goes down, there is a leak.

P1000 to P10mL Models

1. Fit a PIPETMAN® DIAMOND tip.
2. Set the pipette to the maximum volume given in the specifications.
3. Aspirate the set volume from a beaker of distilled water.
4. Maintain the pipette in the vertical position and wait for 20 seconds.
5. If a water droplet appears at the end of the tip, there is a leak.

Chapter 6

MAINTENANCE

Routine maintenance will help keep your pipette in good condition, ensuring a continued high level of performance. Maintenance is limited to cleaning or autoclaving the parts specified under **Cleaning and Decontamination** on page 18 or to replacing the push button, connecting nut, tip ejector, tip holder, seal and O-ring.

NOTICE	**PIPETMAN P2 and P10 should not be disassembled, so you may only replace the push button, tip ejector, dual position tip ejector and its adapter. With these pipettes if the tip holder is damaged, the piston may also be damaged. After replacing any parts you should verify the performance of your pipette following the verification procedure available on the Gilson website (www.gilson.com). If the pipette needs to be readjusted, please contact your local Gilson authorized Service Center.**

Changing the Tip Ejector

1. To remove the tip ejector, keep the tip ejector button depressed and pull down on the flanged upper part of the tip ejector with the other hand.
2. To refit the tip ejector, keep the tip ejector button depressed, slide the end of the tip ejector over the end of the tip holder and push the plastic end of the tip ejector back into the body of the pipette until it is gripped firmly by the metal tip ejector rod.

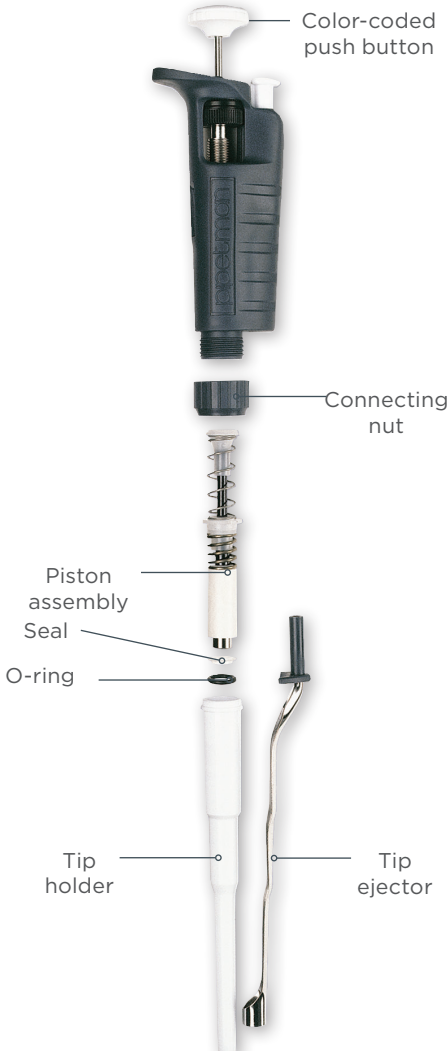

Figure 7
Piston Assembly (Disassembled)

Changing the Tip Holder – No Tools Required

1. Remove the tip ejector (refer to Changing the Tip Ejector on page 15).
2. Unscrew the connecting nut by turning it counter-clockwise.
3. Carefully separate the lower and upper parts.
4. Remove the piston assembly, O-ring, and seal.
5. Clean, autoclave, or replace the tip holder.
6. Reassemble the pipette (refer to Piston Assembly (Disassembled) on page 16).
7. Tighten the connecting nut (turn clockwise).
8. Refit the tip ejector (refer to Changing the Tip Ejector on page 15).

Servicing the Piston Assembly

You may remove the piston assembly for cleaning purposes only. If the piston assembly is changed, the pipette must be adjusted and calibrated in a Gilson authorized Service Center.

NOTICE	The piston assembly must not be autoclaved.

1. Remove the tip ejector (refer to Changing the Tip Ejector on page 15).
2. Unscrew the connecting nut by turning it counter-clockwise.
3. Carefully separate the lower and upper parts.
4. Remove the piston assembly, O-ring, and seal.
5. Clean and decontaminate the piston assembly.
6. Reassemble the pipette (refer to Piston Assembly (Disassembled) on page 16).
7. Tighten the connecting nut (turn clockwise).
8. Refit the tip ejector (refer to Changing the Tip Ejector on page 15).

Changing the O-Ring

The O-ring and seal are on the piston; they must not be autoclaved, if worn or damaged in any way (chemical or mechanical), they must be replaced. The dimensions of the O-ring vary depending on the model of pipette.

1. Remove the tip ejector (refer to **Changing the Tip Ejector** on page 15).
2. Unscrew the connecting nut by turning it counter-clockwise.
3. Carefully separate the lower and upper parts.
4. Remove the piston assembly, O-ring and seal.
5. Clean or replace the seal then the O-ring.
6. Reassemble the pipette (refer to **Piston Assembly (Disassembled)** on page 16).
7. Tighten the connecting nut (turn clockwise).
8. Refit the tip ejector (refer to **Changing the Tip Ejector** on page 15).

Cleaning and Decontamination

PIPETMAN Classic is designed so that the parts normally in contact with liquid contaminants, can easily be cleaned and decontaminated. However, because the models P2 and P10 contain miniaturized parts, it is best not to disassemble these pipettes yourself; please contact your local Gilson authorized service center.

NOTICE	**You may refer to the decontamination procedure available on the Gilson website (www.gilson.com). Liquid must never enter the upper part (handle) of any pipette.**

Cleaning

The pipette must be cleaned, as described below, before it is decontaminated. Soap solution is recommended for cleaning PIPETMAN Classic.

EXTERNAL

1. Remove the tip ejector.
2. Wipe the tip ejector with a soft-cloth or lint-free tissue impregnated with soap solution.
3. Wipe the entire pipette with a soft-cloth or lint- free tissue impregnated with soap solution, to remove all dirty marks. If the pipette is very dirty, a brush with soft plastic bristles may be used.
4. Wipe the entire pipette and the tip ejector with a soft cloth or lint-free tissue soaked with distilled water.
5. Refit the tip ejector and allow the pipette to dry.

INTERNAL

The following components only can be immersed in a cleaning solution: connecting nut, tip ejector, tip holder, piston assembly, seal and O-ring.

1. Disassemble the pipette as described in MAINTENANCE on page 15.
2. Set aside the upper part in a clean, dry place.
3. Clean the individual components of the lower part of the pipette using an ultrasonic bath (20 minutes at 50°C) or with a soft-cloth and brushes. Small round brushes with soft plastic bristles may be used to clean the interior of the tip holder.
4. Rinse the individual components with distilled water.
5. Leave the parts to dry by evaporation or wipe them with a clean soft-cloth or lint-free tissue.
6. Reassemble the pipette as described in MAINTENANCE on page 15.

Autoclaving

The upper part (body) and the piston assembly of the pipette are not autoclavable. Only the following parts may be autoclaved: tip ejector, tip holder and connecting nut. The O-ring and seal are not autoclavable; they may be cleaned or replaced with the one specified in **SPARE PARTS** on page 21.

1. Clean the parts to be autoclaved, especially the tip holder.
2. Put the parts in an autoclaving sack.
3. Autoclave for 20 minutes at 121°C, 0.1 MPa.
4. Check that the parts are dry before re-assembling the pipette.
5. Set the pipette aside to stabilize at room temperature.

Chemical Decontamination

You may choose to decontaminate your pipette chemically, in accordance with your own procedures. Whatever decontaminant you use, check with the supplier of the decontaminant that it is compatible with stainless steel and the plastics used in the construction of the pipette: PA (Polyamide), PBT (Polybutylene Terephtalate), PC (Polycarbonate), PC/PBT (Polycarbonate/ Polybutylene Terephtalate), POM (Polyoxymethylene), or PVDF (Polyvinylidene Fluoride).

UPPER PART (HANDLE)

1. Wipe the upper part (handle) of the pipette with a soft-cloth or lint-free tissue impregnated with the chosen decontaminant.
2. Wipe the upper part of the pipette with a soft- cloth or lint-free tissue soaked with distilled water or sterile water.

LOWER PART (VOLUMETRIC MODULE)

The following components only can be immersed in a decontaminant solution: connecting nut, tip ejector, tip holder, piston assembly, seal and O-ring.

Chapter 7

SPARE PARTS

- Service Kit 1st level includes:
  - piston seals
  - O-rings
  - 1 tip holder
- Service Kit 2nd level includes:
  - 1 push button
  - 1 connecting nut
  - 1 tip ejector
- or only for the P2 and P10 models
  - 1 tip ejector
  - 1 adapter

P2 (F144801) and P10 (F144802)

LABEL	DESCRIPTION	P2	P10
C+D+E	Service Kit 1st level	F144501	F144502
A+B+F1+F2	Service Kit 2nd level	F161970	F161971
C+D	Seal + O-Ring (5 sets)	F144861	F144862
F2	Tip Ejector Adapter	F144879	F144879

P20 (F123600) and P100 (F123615)

LABEL	DESCRIPTION	P20	P100
C+D+E	Service Kit 1st level	F144495	F144496
A+B+F	Service Kit 2nd level	F161972	F161973
C+D	Seal + O-ring (5 sets)	F144863	F144864

P200 (F123601) and P1000 (F123602)

LABEL	DESCRIPTION	P200	P1000
C+D+E	Service Kit 1st level	F144497	F144498
A+B+F	Service Kit 2nd level	F161974	F161978
C+D	Seal + O-ring (5 sets)	F144865	F144866

P5000 (F123603) and P10mL (F161201)

LABEL	DESCRIPTION	P5000	P10ML
C+D+E	Service Kit 1st level	F144499	F144503
A	Push button assembly	F144787	F161281
C+D	Seal + O-ring (5 sets)	F144867	F161829
E	Tip holder	F123608	F161263

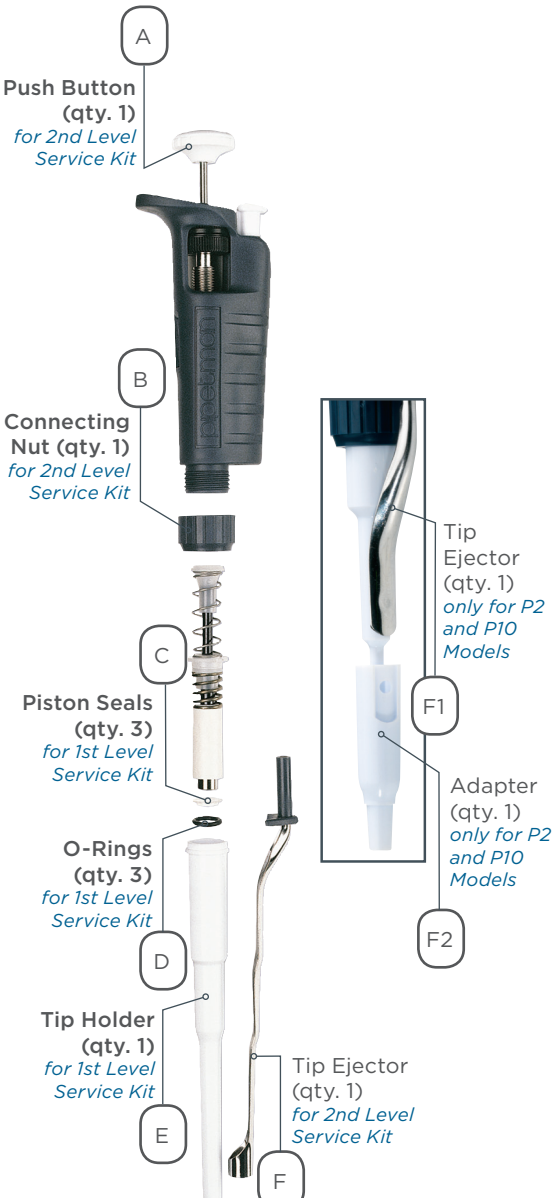

Figure 8
Spare Parts Identified

Chapter 10

WARRANTY

Gilson warrants this pipette 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 pipettes which are subject to abnormal use and/or improper or inadequate maintenance (contrary to the recommendations given in the user's guide), including, but not limited to pipettes which have been subjected to physical damage, improper handling, or spillage or exposure to any corrosive environment. This warranty shall also be void in the event pipettes 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 pipettes or refund of the purchase price paid for such pipettes.

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.

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