PIPETMAN® P

EN ENGLISH User's Guide

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GILSON

PIPETMAN® P

1 - INTRODUCTION

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

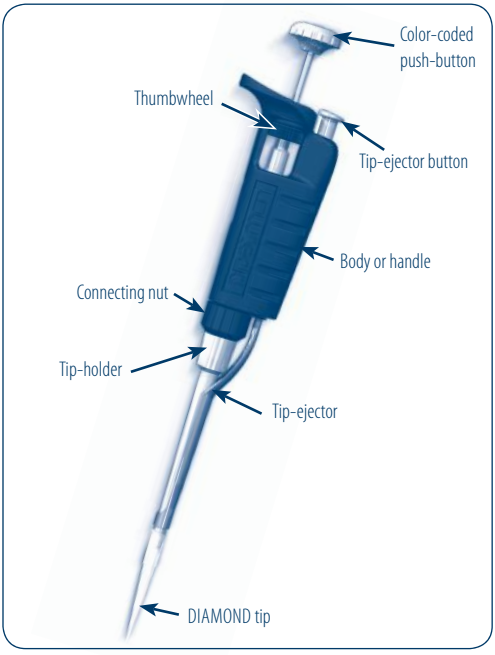
2 - PARTS CHECK LIST

Just take a moment to verify that the following items are present:

- PIPETMAN P,
- User's Guide,
- Safety bag,
- Certificate of conformity (including bar-code sticker).

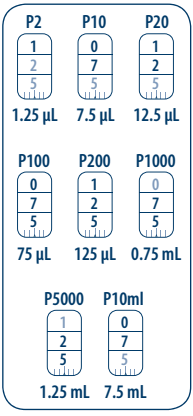
3 - DESCRIPTION

Please refer to the following chapters for a full description of the different parts and functions of the pipette.



4 - 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, proceed as follows:

- when **decreasing** the volume setting, slowly reach the required setting, making sure not to overshoot the mark.
- 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 overshoot the mark.

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

5 - PIPETTING

For optimum performance, use of Gilson's DIAMOND Tips with your PIPETMAN P is strongly recommended. DIAMOND 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.

However, PIPETMAN P can also be used with the main tip brands.

Fitting the tips

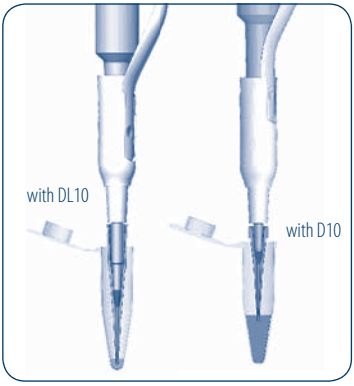
To fit a new Gilson DIAMOND Tip, push the tip-holder into the tip using a slight twisting motion to ensure a firm and airtight seal.

☞ *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, 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 through 180°C.
3. Refit the adapter so that the end of the metallic rod engages the shorter slot of the adapter.
4. Finally, check that the "dimple" on the metallic rod is engaged in the corresponding hole on the adapter.

Dual-position adapter for P2 and P10



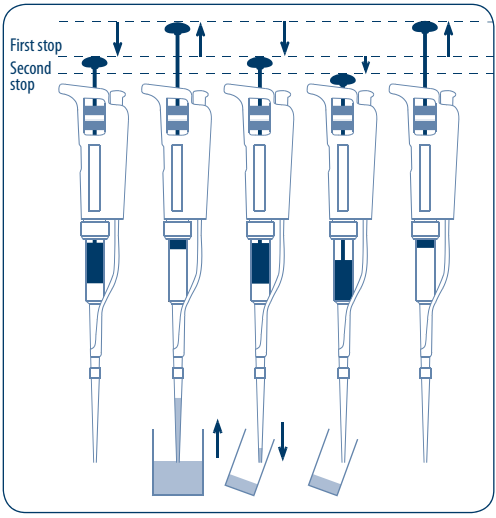
Pre-rinse the tips

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 into the same vessel (or 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 (see immersion depth table, page 8). Release the push-button slowly and smoothly (to **top** position) to aspirate the set volume of liquid. Wait one second (time depends on model, see 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.



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-ejector button.

6 - GENERAL GUIDELINES FOR GOOD PIPETTING

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).

Table - Immersion Depth and Wait Time

Model	Immersion Depth (mm)	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

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 of your pipette by aspirating and dispensing the solvent repeatedly before aspirating the sample.
9. When pipetting liquids with temperatures different to the ambient temperature, pre-rinse the tip several times before use.
10. You may remove the tip-ejector (see Chapter 11 - Maintenance) 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 model P1000, by using a specific tip holder equipped with a filter, you can increase the life-time of the piston (see Chapter 7 - Accessories).
12. Do not pipette liquids having 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).

7 - ACCESSORIES

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

1. To avoid the possibility of liquid running back into the pipette, store the pipette vertically.

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

2. To identify or personalize your pipette, COLORIS™ clips are available:

COLORIS™ clips (mixed colors set of 10)	F161301

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

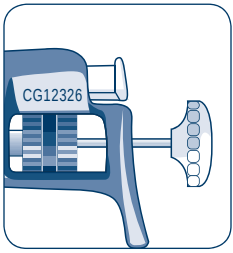
THE JIMMY™ (set of 3)	F144983

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

Corrosion protection kit (tip holder + a bag of filters)	F144570

8 - 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: CG 12326



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

9 - TROUBLESHOOTING

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

You may download from the Gilson website (www.gilson.com) the "2 minute inspection", which shows how to perform a quick diagnosis of your pipette.

Before returning any pipette, ensure that it is completely free of chemical, biological, or radioactive contamination. Refer to Chapter 12 - Cleaning and Decontamination. After decontamination, use the safety bag provided with the pipette to return it to your local Gilson authorized Service Center.

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 Worn O-ring or seal	Replace the tip-holder Replace both parts
Pipette won't aspirate	Worn O-ring Damaged tip-holder Connecting nut is loose Damaged or corroded piston Improper repair or assembly	Replace both parts Replace the tip-holder Tighten connecting nut Return pipette to supplier See Chapter 11 - Maintenance
Pipette is inaccurate	Improper repair or assembly Unscrewed tip-holder Connecting nut is loose	See Chapter 11 - Maintenance Tighten connecting nut Tighten connecting nut
Pipette is not precise	Tip-holder is loose Connecting nut is loose Incorrect operator technique Damaged or corroded piston(s) Damaged tip-holder(s) Worn O-ring or seal	Tighten connecting nut Tighten connecting nut Operator training Return pipette to supplier Replace the tip-holder Replace both parts
Tips fall off or do not fit correctly	Low quality tips Damaged tip-holder(s) Damaged tip-ejector	Use Gilson Diamond tips Replace the tip-holder Replace tip-ejector

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

10 - 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.

For the P2 to P200 models:

1. Fit a Gilson 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.

For the P1000 to P10ml models:

1. Fit a Gilson 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.

11 - 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 Chapter 12 - Cleaning and Decontamination or to replacing the push-button, connecting nut, tip-ejector, tip-holder, seal and O-ring.

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.

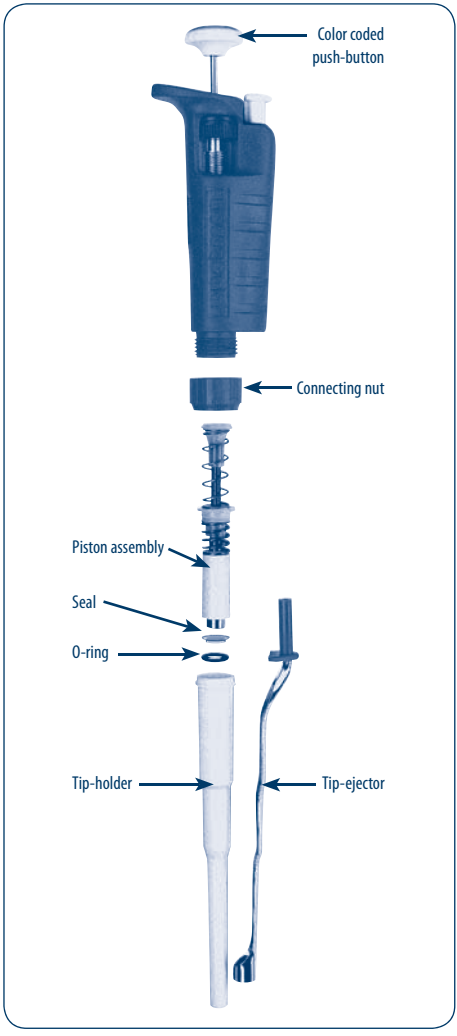
Changing the Tip-ejector

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.

Changing the Tip-holder – no tools required

1. Remove the tip-ejector (see above).
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 the figure, p 14).
7. Tighten the connecting nut (turn clockwise).
8. Refit the tip-ejector (see above).



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.

The piston assembly must not be autoclaved.

1. Remove the tip-ejector (see above).
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 the figure, p 14).
7. Tighten the connecting nut (turn clockwise).
8. Refit the tip-ejector (see above).

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 (see above).
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 the figure, p 14).
7. Tighten the connecting nut (turn clockwise).
8. Refit the tip-ejector (see above).

12 - CLEANING AND DECONTAMINATION

PIPETMAN P 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.

☞ *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 P.

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 the Chapter 11 - Maintenance.
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 the Chapter 11 - Maintenance.

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 Chapter 14 - Spare Parts.

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.

13 - SPECIFICATIONS

PIPETMAN P is a high quality pipette that offers excellent accuracy and precision. The figures given in the "Gilson Maximum Permissible Errors" table (page 19) were obtained using Gilson DIAMOND Tips. These figures are guaranteed only when genuine Gilson 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).

Gilson Maximum Permissible Errors

Single channel Model (Reference)	Volume	(µL)	Maximum Permissible Errors Gilson Systematic error (µL)	Gilson Random error (µL)	ISO 8655 Systematic error (µL)	ISO 8655 Random error (µL)
	Min	0.2	± 0.024	⩽ 0.012	± 0.08	⩽ 0.04
P2		0.5	± 0.025	⩽ 0.012	± 0.08	⩽ 0.04
(F144801)	Max.	2	± 0.030	⩽ 0.014	± 0.08	⩽ 0.04
	Min.	1	± 0.025	⩽ 0.012	± 0.12	⩽ 0.08
P10		5	± 0.075	⩽ 0.030	± 0.12	⩽ 0.08
(F144802)	Max	10	± 0.100	⩽ 0.040	± 0.12	⩽ 0.08
	Min.	2	± 0.10	⩽ 0.03	± 0.20	⩽ 0.10
P20		5	± 0.10	⩽ 0.04	± 0.20	⩽ 0.10
(F123600)		10	± 0.10	⩽ 0.05	± 0.20	⩽ 0.10
	Max.	20	± 0.20	⩽ 0.06	± 0.20	⩽ 0.10
	Min.	20	± 0.35	⩽ 0.10	± 0.80	⩽ 0.30
P100		50	± 0.40	⩽ 0.12	± 0.80	⩽ 0.30
(F123615)	Max.	100	± 0.80	⩽ 0.15	± 0.80	⩽ 0.30
	Min.	50	± 0.50	⩽ 0.20	± 1.60	⩽ 0.60
P200		100	± 0.80	⩽ 0.25	± 1.60	⩽ 0.60
(F123601)	Max.	200	± 1.60	⩽ 0.30	± 1.60	⩽ 0.60
	Min.	200	± 3	⩽ 0.6	± 8	⩽ 3.0
P1000		500	± 4	⩽ 1.0	± 8	⩽ 3.0
(F1123602)	Max.	1000	± 8	⩽ 1.5	± 8	⩽ 3.0
	Min.	1000	± 12	⩽ 3	± 40	⩽ 15
P5000		2000	± 12	⩽ 5	± 40	⩽ 15
(F123603)	Max.	5000	± 30	⩽ 8	± 40	⩽ 15
	Min.	1 mL	± 30	⩽ 6	± 60	⩽ 30
P10ml		2 mL	± 30	⩽ 6	± 60	⩽ 30
(F161201)		5 mL	± 40	⩽ 10	± 60	⩽ 30
	Max.	10 mL	± 60	⩽ 16	± 60	⩽ 30

With a precise pipetting technique (see Chapter 6 - General guidelines for good pipetting) the P2 model may be used to aspirate volumes as low as 0.1 µL and the P10 model as low as 0.5 µL.

The data given in the tables conform to the ISO 8655-2 Standard.

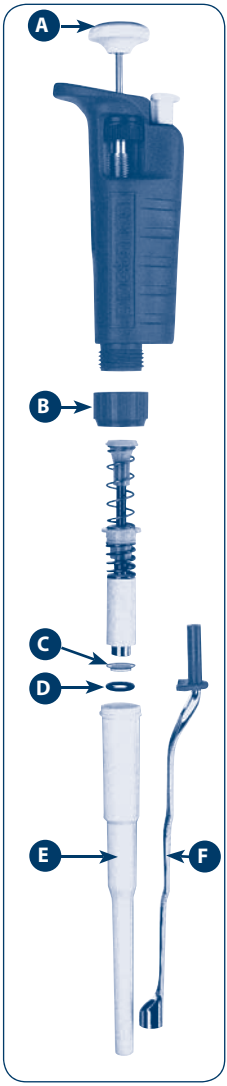
14 - SPARE PARTS

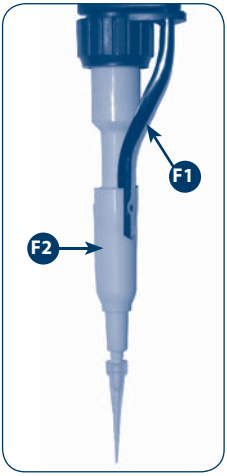
Service Kit 1st level includes:

- 3 piston seals C
- 3 O-rings D
- 1 tip-holder E

Service Kit 2nd level includes:

- 1 push-button A
- 1 connecting nut B
- 1 tip-ejector F
  or only for the P2 and P10 models
- 1 tip-ejector F1
  and 1 adapter F2





P2 (F144801) and P10 (F144802)

	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)

	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)

	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)

	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

EC DECLARATION OF CONFORMITY

The company,

GILSON S.A.S.

19, avenue des Entrepreneurs
BP. 145 - 95400 Villiers-le-Bel (France)
Tel.: +33(0) 1 34 29 50 00
Fax: +33(0) 1 34 29 50 20
www.gilson.com

Hereby certifies on its sole responsibility that the products listed below:

PIPETMAN® P
P2, P10, P20, P100, P200,
P1000, P5000 and P10ml

comply with the requirements of the following European Directives:

98/79/EC*
on In Vitro Diagnostic Medical Devices

** Annex III, self-declared*

Villiers-le-Bel, September 14th, 2005

A. El Sayed
General Manager

H. Ledorze
Quality Manager

CE

GILSON

NOTES

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www.gilson.com
sales@gilson.com
service@gilson.com
training@gilson.com

Gilson, Inc. World Headquarters
3000 Parmenter Street | P.O. Box 620027 | Middleton, WI 53562-0027, USA
Tel: (1) 800-445-7661 or (1) 608-836-1551 | Fax: (1) 608-831-4451

Gilson S.A.S.
19, avenue des Entrepreneurs | BP 145, F-95400 Villiers-le-Bel, France
Tel: (33-1) 34 29 50 00 | Fax: (33-1) 34 29 50 20