

5 - SETTING THE VOLUME

The volume of liquid to be aspirated is set using the volumeter. The volumeter consists of three number-dials, which are read from top (most significant digit) to bottom (least significant digit). A marker is used to set exact or intermediate volumes using the scale on the bottom dial. The dials are colored either black or red to indicate the position of the decimal point, according to 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 thumb-wheel 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 the volume to reach the volume, making sure not to overshoot the mark.

Model	Color of volumeter numbers	
	Black	Red
P2 to P200	µL	0.1 µL and 0.01 µL
P1000, P5000	0.1 mL and 0.01 mL	mL
P10ml	mL	0.1 mL

4 - OPERATING RANGES

Model	Range*
P2	0.2 - 2 µL
P10	1 - 10 µL
P20	2 - 20 µL
P100	20 - 100 µL
P200	50 - 200 µL
P1000	200 - 1000 µL
P5000	1 - 5 mL
P10ml	1 - 10 mL

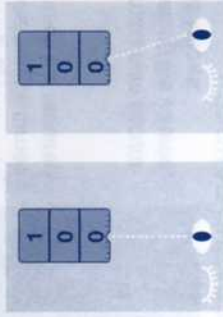
 *With a precise pipetting technique (see "General Guidelines for good pipetting") P2 may be used to aspirate volumes down to 0.1 µL, P10 at 0.5 µL, P100 at 10 µL, P200 at 20 µL, P1000 at 100 µL and P5000 at 500 µL.



Example for each pipette:

P2 1.25 µL	P10 7.5 µL	P20 12.5 µL	P100 75 µL
P200 125 µL	P1000 0.75 mL	P5000 1.25 mL	P10ml 7.5 mL

To avoid parallax errors, make sure that the volume indicator and the selected volume marking are in your direct line of vision. At close range you may find it helps to close one eye.



6 - PIPETTING

- 1) Fit a new Gilson Diamond Tip.
Plastic tips are for a single application - they must not be cleaned for reuse. Push the tip-holder into the tip using a slight twisting motion to ensure a firm and airtight seal.
 - (1) For P2 and P10: tip ejector extensions are supplied.
 - (2) P5000 and P10ml: insert a filter into the tip holder before fitting a tip. (If the filter gets dirty it should be replaced with a clean one.)
 - (3) P5000 and P10ml: these models are not equipped with tip-ejectors.

2) Pre-rinse the tip.

Some liquids (e.g. protein-containing solutions and organic solvents) can leave a film of liquid on the inside the 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.

3) Aspirate.

Press the push-button to the **first stop** (this corresponds to the set volume of liquid).

Hold the pipette vertically and immerse the tip in the liquid (see immersion depth table).

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**.

4) Dispense.

Place the end of the tip against the inside wall of the recipient vessel (at an angle of 10° to 40°).

Press the push-button slowly and smoothly to the **first stop**.

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.

Release the push-button, smoothly.

- if a water droplet appears at the end of the tip, there is a leak.

12 - 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" 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.

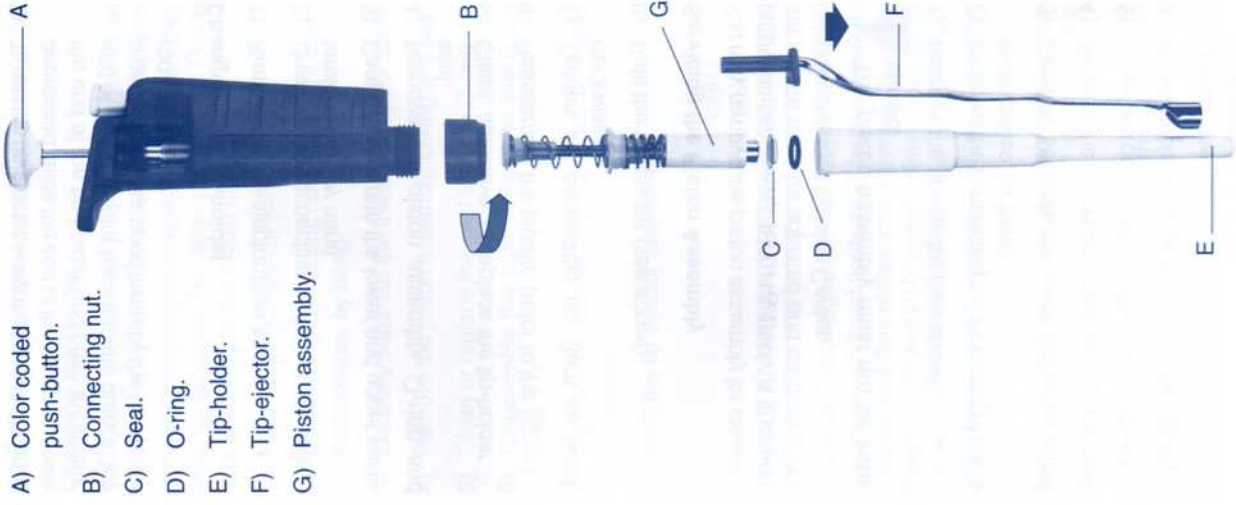
! After replacing any parts you should verify the performance of your pipette following the verification procedure available on the Gilson website (www.gilson.com). If the pipette needs to be readjusted, please contact your local Gilson authorized Service Center.

Tip-ejector and Tip-holder

These parts must be changed, if they are accidentally damaged or attacked chemically. You should also remove these parts for cleaning or decontamination purposes. A cloth dampened with ethanol may be used to routinely clean the outside of the pipette.

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 (moderate force is required).



- A) Color coded push-button.
- B) Connecting nut.
- C) Seal.
- D) O-ring.
- E) Tip-ejector.
- F) Tip-holder.
- G) Piston assembly.

- 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 tip-ejector rod (metal).

Changing the Tip-holder

- 1) Remove the tip-ejector (see above).
- 2) Unscrew the connecting nut by turning it counterclockwise, by hand.
- 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).
- 7) Tighten the connecting nut (turn by hand, 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 counterclockwise, by hand.
- 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).
- 7) Tighten the connecting nut (turn by hand, clockwise).

- 8) Refit the tip-ejector (see above).


Changing the O-ring

The O-ring and seal are normally to be found 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 according to the model of pipette.

- 1) Remove the tip-ejector (see above).
- 2) Unscrew the connecting nut by turning it counterclockwise, by hand.
- 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 page 17).
- 7) Tighten the connecting nut (turn by hand, clockwise).
- 8) Refit the tip-ejector (see above).

13 - 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 Pipetman 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 (body) of any pipette.**