



Eppendorf Series 2000 Reference[®] fix · adjustable

Instruction Manual · Mode d'emploi · Manual de Instrucciones

eppendorf

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Reference pipettes are manufactured under U.S. Patent No. 5,511,433; 4,961,350

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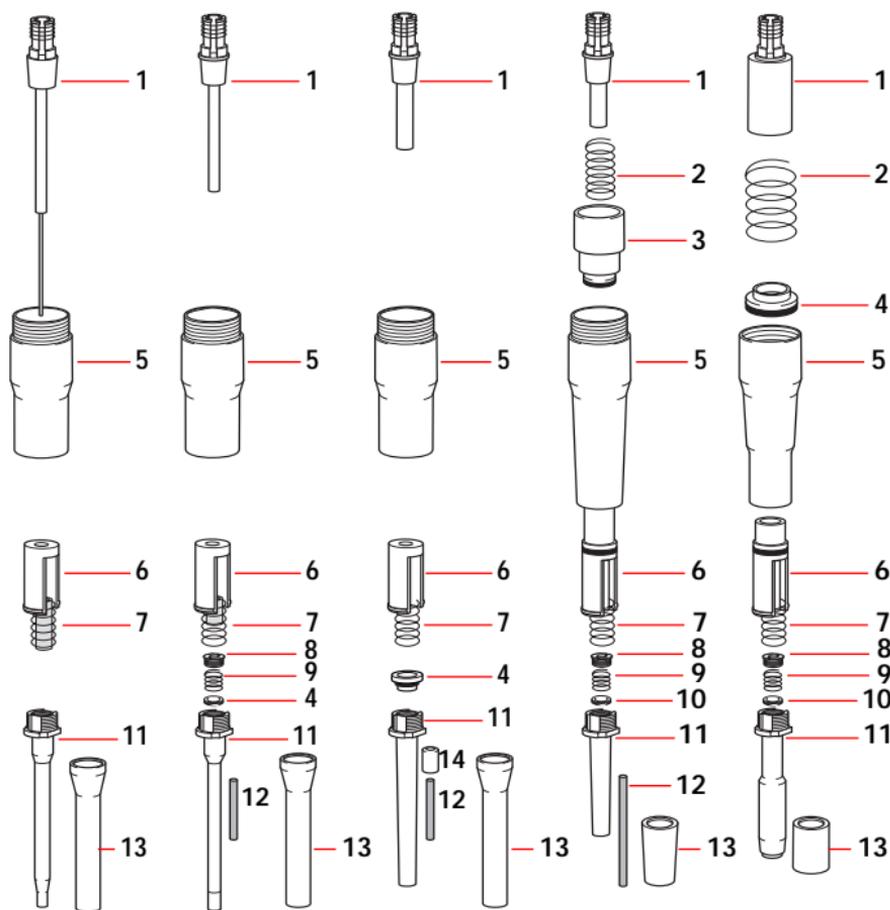
Fig. 1

Reference Adjustable-Volume / Reference variable

0.1 – 2.5 μL 10 – 100 μL 20 – 200 μL 100 – 1000 μL 500 – 5000 μL
 0.5 – 10 μL
 2 – 20 μL

Reference Fixed-Volume / Reference Volumen fijo

1 – 50 μL 100 μL 200 – 250 μL 500 – 2500 μL



Quality assurance

This eppendorf Pipette has been manufactured and tested under stringent quality controls to ensure its accuracy and precision.

It is guaranteed against defects in workmanship or faulty parts

for 24 months

after the date of delivery. Please refer to the notes in this instruction manual.

If, in spite of our extensive controls, the pipette is defective, please return it to your eppendorf distributor.

Certificado de calidad

Al comprar una pipeta eppendorf se ha decidido por un instrumento de precisión, que ha sido fabricado y controlado por nosotros con el mayor cuidado.

Por consiguiente, puede confiar en su trabajo completamente en la exactitud y precisión de su pipeta. Garantizamos un funcionamiento perfecto, un acabado sólido y un material sin fallos.

Para esta pipeta le damos

24 meses de garantía.

Por favor, observe los avisos indicados en las instrucciones de uso.

Si a pesar de los amplios controles se nos hubiera escapado un fallo, por favor haga uso de su derecho de garantía, devolviendo la pipeta a su distribuidor.

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1 Safety precautions and applicational limitations

Before using the Reference pipette, please read the operating manual. To ensure safe, problem-free service from the Reference pipette, it is essential to observe the following points:

1.1 Handling

- Only use pipettes in the Reference-Serie when a pipette tip has been attached.
- Do not lay down the pipette when a filled pipette tip is attached.
- When using infectious, radioactive, toxic and/or other solutions that pose a health risk, please observe the statutory safety regulations in force in the country in which the pipette is being used.
- When using organic solvents and aggressive chemicals, check the suitability of use with pipette tips (made of PP = polypropylene) and the pipettes.
- When using solutions with physical characteristics which differ to a large extent to those of water (e.g. glycerol), check the dispensing volume as described in Section 5.2.
- Avoid differences in temperature between pipettes and pipette tips as well as the liquid used as this may lead to incorrect volumes being dispensed.
- The above may also occur when liquids with a high vapor pressure are used.

1.2 Care and maintenance

- Do not allow any liquid to enter into the pipette.
- Do **not** clean the pipette with acetone or aggressive solutions.
- Use original spare parts and accessories (pipette tips) only.

2 Technical data

2.1 Reference fix

Model / Volume	Inaccuracy	Imprecision
1 µL	± 2.5 %	≤ 1.8 %
2 µL	± 2.0 %	≤ 1.2 %
5 µL	± 1.5 %	≤ 0.8 %
10 µL	± 1.0 %	≤ 0.5 %
20 µL	± 0.8 %	≤ 0.3 %
25 µL	± 0.8 %	≤ 0.3 %
50 µL	± 0.7 %	≤ 0.3 %
100 µL – 2500 µL	± 0.6 %	≤ 0.2 %

2.2 Reference variable

Model	Volume increment µL	Volume µL	Inaccuracy	Imprecision	
0.1 – 2.5	dark gray	0.002	0.25	± 12.0 %	≤ 6.0 %
			1.25	± 2.5 %	≤ 1.5 %
			2.5	± 1.4 %	≤ 0.7 %
0.5 – 10	light gray	0.01	0.5	± 5.0 %	≤ 2.8 %
			1	± 2.5 %	≤ 1.8 %
			5	± 1.5 %	≤ 0.8 %
			10	± 1.0 %	≤ 0.4 %
2 – 20	light gray	0.02	2	± 3.0 %	≤ 2.0 %
			10	± 1.0 %	≤ 0.5 %
			20	± 0.8 %	≤ 0.3 %
2 – 20	yellow	0.02	2	± 5.0 %	≤ 1.5 %
			10	± 1.2 %	≤ 0.6 %
			20	± 1.0 %	≤ 0.3 %
10 – 100	yellow	0.1	10	± 2.5 %	≤ 0.7 %
			50	± 0.8 %	≤ 0.3 %
			100	± 0.8 %	≤ 0.15 %
50 – 200	yellow	0.2	50	± 1.0 %	≤ 0.3 %
			100	± 0.9 %	≤ 0.3 %
			200	± 0.6 %	≤ 0.2 %
50 – 250	blue	0.2	50	± 1.4 %	≤ 0.3 %
			100	± 1.1 %	≤ 0.3 %
			250	± 0.6 %	≤ 0.2 %
100 – 1000	blue	1.0	100	± 1.6 %	≤ 0.3 %
			500 – 1000	± 0.6 %	≤ 0.2 %
500 – 2500	red	2.0	500	± 1.5 %	≤ 0.3 %
			1000	± 0.8 %	≤ 0.2 %
			2500	± 0.6 %	≤ 0.2 %

The technical data given is valid only when eppendorf pipette tips are used. Tests carried out in accordance with DIN 12650 for piston-stroke pipettes with an air cushion using a precision balance with evaporation trap approved by the standardization authorities.

Number of determinations:

10; degassed, bidistilled water, 20 °C – 25 °C, constant to ± 0.5 °C; with pre-wetted pipette tip; dispensing carried out on inner wall of vessel; for volumes < 10 μL , test carried out upon removal from the weighing vessel, due to the risk of evaporation.

3 Function principle

The pipettes in the Reference-Serie are piston-stroke pipettes that operate according to the air-cushion principle.

The Reference-Serie consists of fixed-volume pipettes and pipettes with an adjustable volume setting.

The control button is multi-functional. The function executed by the pipette depends on how far its control button is pressed down.

Three steps are necessary to operate the pipette:

1. Measuring stroke

Press the control button down until the first stop. The desired volume of liquid is dispensed or, when the button is released, aspirated.

2. Blow-out

Press the button down a little more until the next stop. Any liquid remaining in the pipette tip is emptied.

3. Ejection

Press the button all the way down. The pipette tip is ejected.

4 Operation

The pipette can be individually labelled. The autoclavable blank adhesive label provided can be marked with a permanent marker and fits onto the identification area on the top of the housing.

4.1 Volume setting

The volume is adjusted by pressing down the lateral catch and turning the control button at the same time.

It is advisable to carry out volume setting from the higher down to the lower value. i.e. first go above the desired volume and then return to the lower value.

4.2 Pipette tips

The pipette can function only when a pipette tip is attached into which the liquid is aspirated.

To facilitate the search for a suitable tip, the color of the control buttons corresponds to the color of the eppendorf tip racks.

When pipetting liquids with wetting properties different to those of water, please observe the recommendations contained in Section 4.5.

4.3 Aspirating liquid

- The liquid which is to be aspirated is taken from a suitable vessel.
- Attach suitable pipette tip to the pipette firmly (observe the color coding).
- Press down the control button to the first stop (measuring stroke).
- Immerse the pipette tip vertically approx. 3 mm into the liquid.
- Allow the control button to slide back **slowly**.
- Pull the tip out of the liquid **slowly**.
- To remove any remaining droplets, dab with non-fibrous cellulose material. When doing so, ensure that no liquid comes out of the tip.

4.4 Dispensing liquid

- Hold the tip at an angle against the inside wall of the tube.
- Press down the control button slowly to the first stop (measuring stroke) and wait until the liquid stops flowing.
- Press down the control button to the second stop (blow-out) until the tip is completely empty.
- Hold down the control button and pull the tip up the inner wall of the tube.
- Allow the control button to slide back slowly.
- Tip is ejected by pressing the control button to the final stop.



Please do not lay down the pipette when a filled pipette tip is attached as this may result in liquid entering the pipette!

4.5 Special notes

Volumes > 10 μL :

To guarantee the highest degree of precision and accuracy, we recommend pre-wetting all new tips by aspirating and dispensing liquid two or three times before pipetting.

Finally, with the tip not in contact with the liquid, empty it completely on the inner wall of the tube (via blow-out).

Explanation: Why does the pipette tip have to be **pre-wetted**?

To compensate for the properties of the liquid.

Wetting liquids (serum, detergent) form a thin film on the inner wall of the pipette tip. When the first pipetting is carried out, the volume dispensed would thus be too low.

When pipetting serum or high-viscosity solutions, wait a few seconds when aspirating and dispensing liquid.

Volumes < 10 μL :

The specified values for accuracy and precision can only be attained if the volume from a tip that has **not been pre-wetted is rinsed** into a specimen liquid! Immerse the filled pipette tip into the specimen liquid. Press the control button several times.

Execute a blow-out and pull the tip upwards along the inner wall of the tube. Discard the tip.

5 Testing / Alignment

The serial number of the pipette is located on its control button.

5.1 Testing

Volumes < 1 μL :

We recommend the photometric test. Our brochure "Photometric test for checking the precision and accuracy of small volumes" is available upon request.

Volumes > 1 μL :

For volumes $> 1 \mu\text{L}$, the test can be performed by weighing the volume using an analytical balance with a sufficient level of sensitivity.



The bidistilled water, weighing vessel, pipette and pipette tip must all be the same temperature!

To calculate the volume, divide the weight by the density of the water (at 20 °C: 0.9982).

Volumes 1 – 10 μL :

The test is performed by taking the volume from a weighed, water-filled tube using a tip that has not been pre-wetted.

Volumes > 10 μL :

Distilled water is dispensed from a pre-wetted tip into a tube and is then weighed.

5.2 Alignment

5.2.1 When should alignment be carried out?

The pipettes in the Reference-Serie were tested during production in accordance with the measurement conditions for water listed in Section 2.

In the case of doubts arising about the accuracy of the pipetted volume, the following points should first be checked:

- Is the pipette leaking? (This is one possible reason for dispensed volumes being too low; troubleshooting and solutions are contained in Section 7)
- What is the temperature of the sample? (In open tubes, water at room temperature cools down due to evaporation.)
- What is the temperature of the pipette?

- What is the temperature of the air?
- Has mg been converted into μL ?
- Does the sample have a different density to that of water?
- Is the pipetting speed too high?

Assistance with these questions is contained in eppendorf's SOP (Standard Operation Procedure).

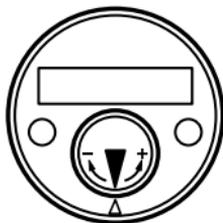
If these checks prove to be unsuccessful, it is safe to assume that the alignment of the pipette has altered (e.g. due to several components having been replaced).

5.2.2 Follow-up alignment in the case of error

From a technical point of view, this is a zero-point shift. The value by which the setting of the pipette is shifted remains constant across the entire measuring range. If, for example, in the case of a 10 – 100 μL pipette, follow-up alignment of 1 μL is carried out at 100 μL (=1 %), the pipette is also adjusted by 1 μL at 10 μL (= 10 %!)

Alignment Reference fix:

To assist you in finding the basic setting again, round adhesive labels with an arrow are provided as an alignment aid.



- Stick the alignment aid onto the control button.

Determine the volume by weighing and calculation (see point a – c "Alignment Reference variable").

- d Loosen slightly the inner screw in the opening on the side of the top of the pipette using side B of the wrench provided until the control button can be turned.

- e Adjust control button by the volume determined.
One revolution of the control button corresponds to the following values for water:

Reference fix	Vol./revol.
1, 2, 5, 10 µL	approx. 0.5 µL
10, 20 µL	approx. 1 µL
25, 50 µL	approx. 2.4 µL
100 µL	approx. 5 µL
200, 250 µL	approx. 12 µL
500, 1000 µL	approx. 46 µL
1500, 2000, 2500 µL	approx. 118 µL

Clockwise rotation: decrease in volume.

Counterclockwise rotation: increase in volume.

- f Tighten the screw until the control button can no longer be turned.

Then continue as described in steps f and g of the Alignment Reference variable.

If the nominal volume does not correspond with the measuring result, repeat steps d – g.

Alignment Reference variable:

- The pipette, tip and water must all be the same temperature (20 – 25 °C, constant to ± 0.5 °C).
- Set the Reference variable to the desired nominal volume.
- With a pipette tip attached to the pipette, the desired volume is pipetted and weighed 10 times. The average of this weighing is converted into µL using the following formula:

$$\text{Volume} = \frac{\text{Weight}}{\text{Density of liquid}} \\ \text{(at the temperature specified)}$$

The value obtained is the actual setting (density of water at 20 °C: 0.9982).

- To adjust the alignment, insert side B of the wrench provided into the alignment opening on the side of the top of the pipette and connect carefully with the inner adjustment bushing.
- Turn the wrench to adjust the volume display of the pipette (with piston stroke unchanged) to the actual volume (measurement under step c).

- f Remove the wrench.
- g Repeat step c). The readings must be within the tolerances specified in the technical data.

If the nominal value still does not agree with the measuring result, repeat steps d – g.

Since this adjustment affects the entire measuring range, it is imperative to check the other volumes of this pipette specified in the technical data.

5.2.3 Adjustment for liquids with a density different to that of water

It is possible to adjust the pipette for **one specific volume of liquid** with a density different to that of water in such a way that the volume displayed corresponds to the volume pipetted.

All other values for the adjustable pipettes are now out of alignment, i.e. an adjustable-volume pipette has been converted into a fixed-volume pipette!

Proceed as described in Section 5.2.2.



A pipette set in this way delivers a pipetting value that correlates with that in the display **only for the liquid used and for the volume tested!** For this reason, we very strongly recommend labeling the converted pipette **as a fixed-volume pipette** for "Solution y"!

The error for liquids with a higher vapor pressure (e.g. organic solvents) cannot be aligned in this way. In this case, we recommend using an eppendorf positive-displacement pipette.

6 Care / Sterilization

6.1 Care

Depending on the frequency of use, all parts of the pipette should be cleaned from time to time in a soap solution or should be sterilized using 60 % isopropanol. They should then be rinsed in distilled water and dried. The seals are maintenance-free and the pistons should be lubricated lightly (using the silicone grease provided) when cleaned or replaced.

Severe contamination caused by the liquid entering the pipette can be removed after the pipette has been disassembled (see Part B, Maintenance).

For information about replacing defective parts, please see Part B, Maintenance.

6.2 Sterilization

The Reference-Serie including the blank label provided (marked with a permanent marker) is fully autoclavable at 121 °C for 20 minutes.

Before autoclaving, unscrew the pipette at the central junction by rotating about one revolution. This enables steam to penetrate more easily into the pipette during autoclaving.

After autoclaving, the pipette may have to be dried at room temperature. Retighten the central junction only after the pipette has completely cooled. The nose cone may have to be tightened again with the wrench (see part B, Maintenance).

The Reference can be stored aseptically under ultra violet light ≥ 254 nm.

7 Troubleshooting

Error	Cause	Solution
Droplets on the inner wall of the pipette tip.	<ul style="list-style-type: none"> - Uneven wetting of the plastic wall. - A pipette tip with poor wetting properties has been used. 	<ul style="list-style-type: none"> - Attach a new pipette tip. - Use an original eppendorf tip.
Pipette is dripping and/or the volume pipetted is incorrect.	<ul style="list-style-type: none"> - The tip is loose. - A poorly fitting pipette tip has been used. - Liquid with a high vapor pressure has been pipetted. - Tip has been taken out of the liquid too quickly. <p>The pipette is dripping because:</p> <ul style="list-style-type: none"> - Piston is contaminated. - Piston is damaged. - Seals are damaged. - Nose cone loose. 	<ul style="list-style-type: none"> - Press the tip firmly in place. - Use an original eppendorf tip. - In this case, we recommend pipetting using a positive-displacement pipette. - Remove the tip slowly from the liquid. - Clean and lightly lubricate the piston. - Replace the piston and seal (see Part B, Maintenance). - Replace all seals (see Part B, Maintenance). - Lightly tighten nose cone with wrench (see Part B, Maintenance). Exchange, where necessary.

Error	Cause	Solution
Control button jams, moves erratically.	<ul style="list-style-type: none"> - Piston contaminated. - Seals contaminated. - Penetration of solvent vapors. 	<ul style="list-style-type: none"> - Clean piston and lubricate lightly. - Disassemble pipette. Clean all seals and exchange where necessary (see Part B, Maintenance). - Unscrew pipette at the central junction and ventilate. Clean piston and lubricate lightly.
Pipette blocked, too little liquid is aspirated.	<ul style="list-style-type: none"> - Liquid has penetrated the nose cone and dried. <p>For 25 to 500 μL pipettes:</p> <ul style="list-style-type: none"> - The filling tube in the nose cone is blocked. 	<ul style="list-style-type: none"> - Unscrew pipette at the central junction, rinse lower part first with warm water, then with distilled water and allow to dry. <p>Or:</p> <ul style="list-style-type: none"> - Disassemble pipette. Replace ejector seal in the nose cone (see Part B, Maintenance). <p>For 25 to 50 μL:</p> <ul style="list-style-type: none"> - Replace nose cone. <p>For 10 to 500 μL:</p> <ul style="list-style-type: none"> - Replace the filling tube in the nose cone (see Part B, Maintenance).

Maintenance

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For information on replacing pistons and seals as well as on disassembling and assembling the different models in the Reference-Serie please open the fold-out cover at the front of this manual.

The fix and variable pipettes are of identical construction. You should therefore refer to the figure corresponding to the volume of your pipette or the volume range it falls in.

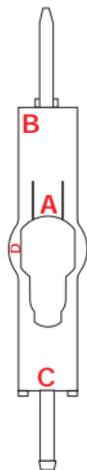
I. Exchanging the piston

- Unscrew pipette at the central junction.
- Press control button and hold down. Hold piston at the top of the piston mounting and pull off. If the piston fits too tightly, the spring at the piston mounting can be pressed down slightly with side B of the wrench and the piston then pulled off.
- Attach new piston down to the stop and lubricate lightly.

II. Exchanging the seals

The lower parts of the Reference-Serie can be completely disassembled for cleaning and maintenance using the wrench provided.

The wrench has the following functions:



- A** = Narrow opening: for loosening and tightening the nose cone.
Wide opening (D): For tightening the nose cone (with the lettering facing the pipette tip).
The wrench is designed in such a way that the nose cone cannot be tightened too much.
- B** = For loosening the screw in the nose cone.
During assembly, for mounting the screw, spring and seal and tightening the screw.
During alignment, for adjusting the volume display.
- C** = For removing the seal in the nose cone.

Removing the seals

Fig. 2 – 6 on the following pages show you how to remove the seals. The numbers shown are identical with the numbers in the Ordering information (see page 53) and the numbers of the parts on the fold-back cover at the front of this manual.

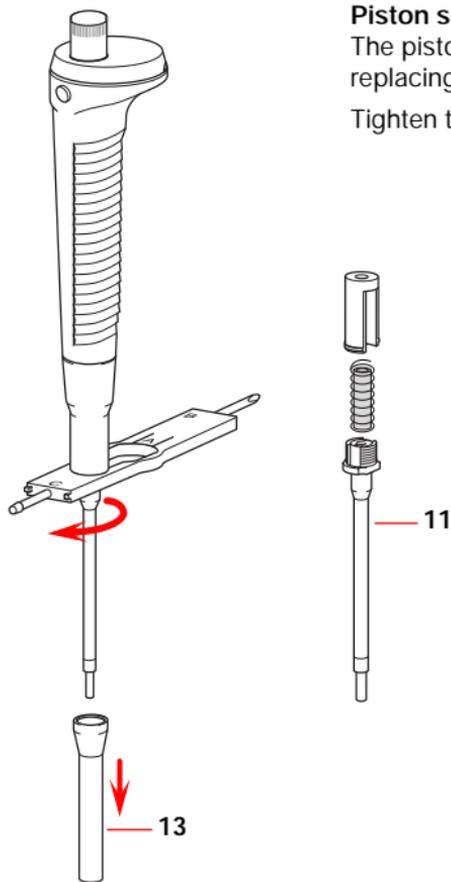
0.1 – 2.5 μ L, 0.5 – 10 μ L and 2 – 20 μ L (Fig. 2)

Push the control button all the way down and pull off the ejector sleeve (13).

Piston seal

The piston seal in the nose cone is exchanged by replacing the entire nose cone (11).

Tighten the nose cone (see IV of this part).



10 – 100 μL (Fig. 3)

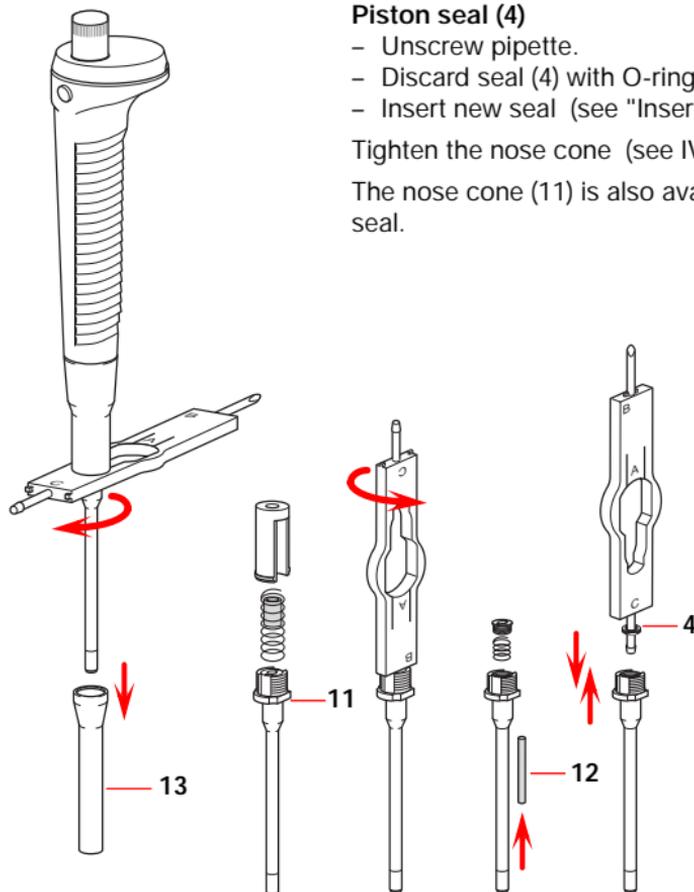
Push the control button all the way down and pull off the ejector sleeve (13).

Piston seal (4)

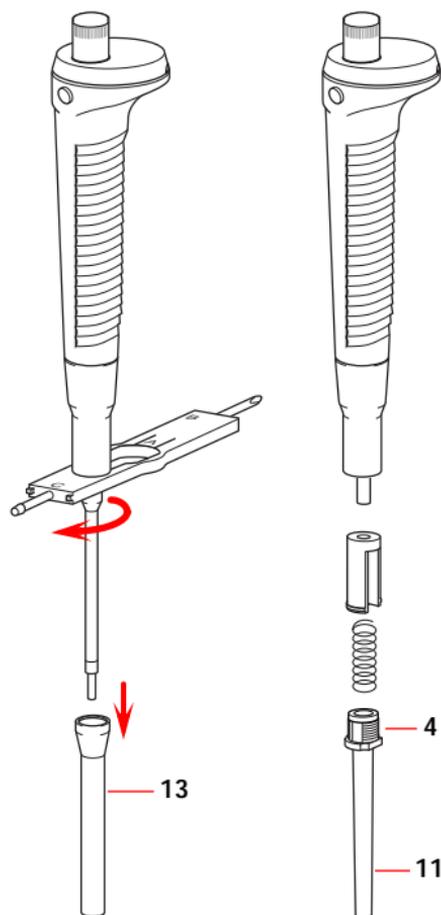
- Unscrew pipette.
- Discard seal (4) with O-ring.
- Insert new seal (see "Inserting the seals").

Tighten the nose cone (see IV of this part).

The nose cone (11) is also available complete with seal.



50 – 200 μL (Fig. 4)

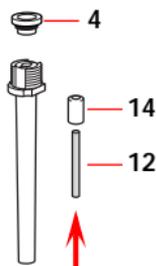


Push the control button all the way down and pull off the ejector sleeve (13).

Piston seal (4)

- Unscrew pipette.
- Remove piston seal (4) from nose cone (with the piston in the grip of the pipette) and discard.
- Place new piston seal onto nose cone.

Tighten the nose cone (see IV of this part).



50 – 250 μL (Fig. 5)

Push the control button all the way down and pull off the ejector sleeve (13).

Piston seal (4)

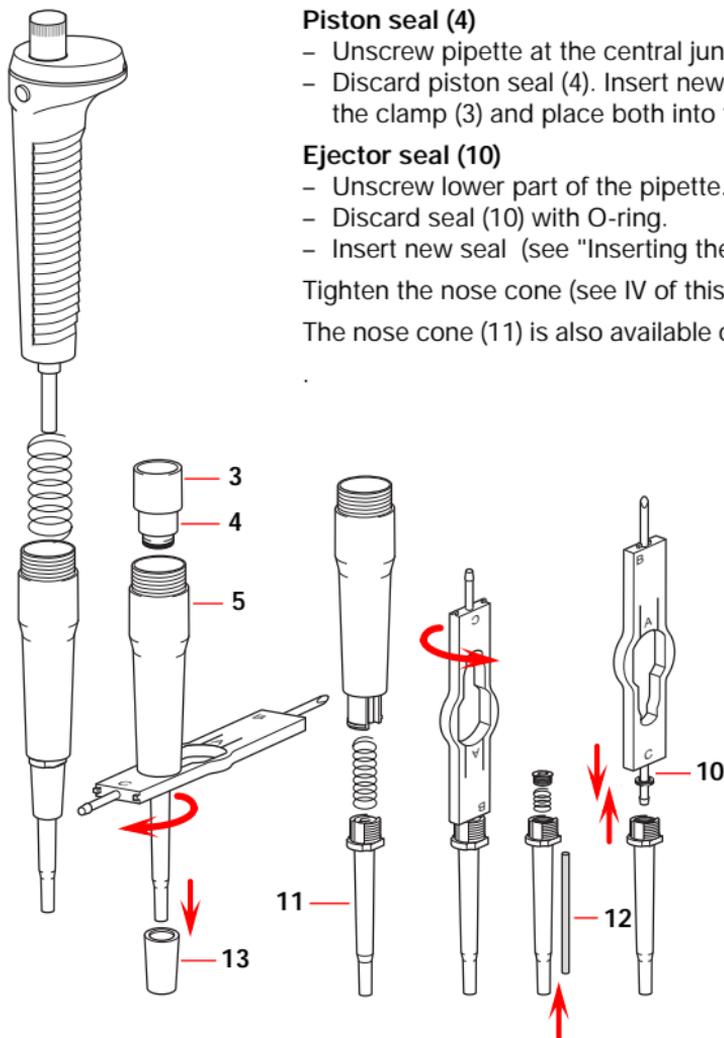
- Unscrew pipette at the central junction.
- Discard piston seal (4). Insert new piston seal into the clamp (3) and place both into the lower part (5).

Ejector seal (10)

- Unscrew lower part of the pipette.
- Discard seal (10) with O-ring.
- Insert new seal (see "Inserting the seals").

Tighten the nose cone (see IV of this part).

The nose cone (11) is also available complete with seal.



100 – 1000 and 500 – 2500 μL (Fig. 6)

Push the control button all the way down and pull off the ejector sleeve (13).

Piston seal (4)

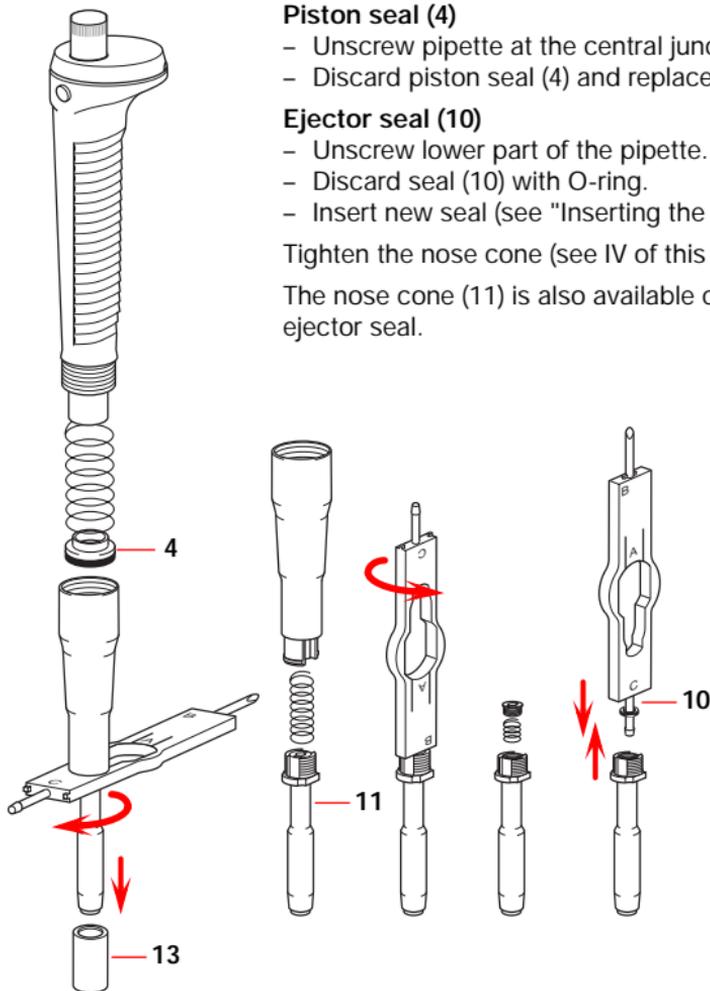
- Unscrew pipette at the central junction.
- Discard piston seal (4) and replace.

Ejector seal (10)

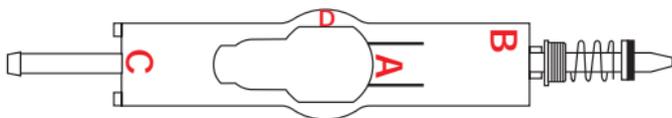
- Unscrew lower part of the pipette.
- Discard seal (10) with O-ring.
- Insert new seal (see "Inserting the seals").

Tighten the nose cone (see IV of this part).

The nose cone (11) is also available complete with ejector seal.



Inserting the seals



Pull new seal off the pin and push screw, spring, seal (with plastic part first) in that order onto side B of the wrench as shown in the figure and screw lightly into nose cone. Do not tighten too much. Assemble pipette again.

III. Exchanging the filling tube

10 – 100 μL , 50 – 200 μL and 50 – 250 μL (Fig. 3, 4, 5)

Filling tube (12)

- Unscrew lower part of the pipette.
- Push filling tube (12) (and damping tube (14) for 50 – 250 μL) out of the nose cone from below with the wire punch. Push in new tube from above.

IV. Exchanging the nose cone

After the ejector sleeve has been pulled off, the nose cone together with the seal (11) can be loosened with the wrench (A, narrow opening) and exchanged (together with the seal. See Fig. 2 – 6).

Tighten the nose cone:

Place wrench with the wide opening (A, lettering facing the pipette tip) onto the nose cone and tighten until it locks into position by turning half a revolution. The wrench is designed in such a way that the nose cone cannot be tightened too much.

Caution

After exchanging parts or completing other maintenance, always check that the pipette functions correctly (see Part A, Section 7 of this Manual).

If a problem cannot be solved with the aid of the recommendations above, please return the Series 2000 Reference to Brinkmann Instruments.

I. Reference Fixed-Volume**Pipettes / spare parts****Models**Gray control button (use 10 μL pipette tips)

1 μL	22 47 040-0
2 μL	22 47 045-1
5 μL	22 47 050-7
10 μL , UM	22 47 055-8

Yellow control button (use 100 μL pipette tips)

10 μL	22 47 060-4
20 μL	22 47 075-2
25 μL	22 47 080-9
30 μL	22 47 085-0
50 μL	22 47 095-7
75 μL	22 47 100-7
80 μL	22 47 105-8
90 μL	22 47 110-4
100 μL	22 47 115-5
150 μL	22 47 120-1
200 μL	22 47 125-2

Blue control button (uses 1000 μL pipette tips)

250 μL	22 47 130-9
300 μL	22 47 135-0
500 μL	22 47 145-7
800 μL	22 47 155-4
900 μL	22 47 160-1
1000 μL	22 47 165-1

Red control button (uses 2500 μL pipette tips)

1500 μL	22 47 170-8
2000 μL	22 47 175-9
2500 μL	22 47 180-5

(Please open up the fold-back cover at the front of this manual).

Only parts with order numbers are available separately.

1 Piston

1	-	10 µL (gray button)	22 47 508-8
10	-	20 µL (yellow button)	22 47 510-0
25	-	50 µL	22 47 511-8
75	-	100 µL incl. piston seal (4)	22 47 512-6
150	-	200 µL	22 47 514-2
		250 µL	22 47 516-9
300	-	1000 µL incl. piston seal (4)	22 47 518-5
1500	-	2500 µL incl. piston seal (4)	22 47 520-7

2 Piston spring

		250 µL	22 47 522-3
300	-	1000 µL	22 47 524-0
1500	-	2500 µL	22 47 526-6

3 Clamp (250 µL)

4 Piston seal

75	-	100 µL incl. screw (8), spring (9)	22 47 528-2
150	-	200 µL incl. screw (8), spring (9)	22 47 530-4
		250 µL incl. screw (8), spring (9), ejector seal (10)	22 47 532-1
300	-	1000 µL incl. screw (8), spring (9), ejector seal (10)	22 47 534-7
1500	-	2500 µL incl. screw (8), spring (9), ejector seal (10)	22 47 536-3

5 Lower housing

6 Ejector, includes ejector spring (7)

1	-	20 µL incl. ejector tube	22 47 538-0
25	-	100 µL incl. ejector tube	22 47 540-1
150	-	200 µL	22 47 542-8
		250 µL	22 47 546-1
300	-	1000 µL	22 47 548-7
1500	-	2500 µL	22 47 550-9

7 Ejector spring (1 – 100 µL includes ejector tube)

8 Screw for nose cone

9 Nose cone spring

10 Ejector seal

11 Nose cone, complete

1	-	10 µL	gray, incl. seal	22 47 554-1
10	-	20 µL	yellow, incl. seal	22 47 558-4
25	-	50 µL	incl. (8), (9), (4), (12)	22 47 560-6
75	-	100 µL	incl. (8), (9), (4), (12)	22 47 562-2
150	-	200 µL	incl. (12), (14)	22 47 564-9
		250 µL	incl. (8), (9), (10), (12)	22 47 566-5
300	-	500 µL	incl. (8), (9), (10), (12)	22 47 568-1
800	-	1000 µL	incl. (8), (9), (10)	22 47 570-3
1500	-	2500 µL	incl. (8), (9), (10)	22 47 572-0

12 Reducing tube (5 pieces, 1 wire punch)

75	-	100 µL		22 47 574-6
150	-	200 µL		22 47 576-2
		250 µL		22 47 578-9
300	-	500 µL		22 47 580-1

13 Ejector sleeve

1	-	100 µL		22 47 582-7
150	-	200 µL		22 47 584-3
250	-	1000 µL		22 47 586-0
1500	-	2500 µL		22 47 588-6

14 Damping tube

Lower part complete, includes piston and (3)-(14)

		10 µL	UM (gray button)	22 47 592-4
10	-	20 µL	(yellow button)	22 47 596-7
25	-	50 µL		22 47 598-3
75	-	100 µL		22 47 600-9
150	-	200 µL		22 47 602-5
		250 µL		22 47 604-1
300	-	500 µL		22 47 606-8
800	-	1000 µL		22 47 608-4
1500	-	2500 µL		22 47 610-6

Series 2000 Reference repair kit

22 47 504-5

(1 tube of silicone lubricant, 1 wrench, 6 blank labels,
1 wire punch, 1 reducing tube each for 75 – 100 µL,
150 – 200 µL, 250 µL and 300 – 500 µL)

Series 2000 Reference® – Part B – Ordering information

Calibration aid labels (5 pieces)	22 47 500-2
Silicone lubricant for piston	22 34 850-7
Wrench	22 47 502-9

II. Reference Adjustable-Volume

Pipettes / spare parts

Models

Dark gray control button (uses 2.5 µL pipette tips)	
0.1 – 2.5 µL	22 47 000-1
Gray control button (uses 10 µL pipette tips)	
0.5 – 10 µL, UM	22 47 005-1
2 – 20 µL, UM	22 47 010-8
Yellow control button (uses 100 µL pipette tips)	
2 – 20 µL	22 47 015-9
10 – 100 µL	22 47 020-5
50 – 200 µL	22 47 025-6
Blue control button (uses 1000 µL pipette tips)	
100 – 1000 µL	22 47 030-2
Red control button (uses 2500 µL pipette tips)	
500 – 2500 µL	22 47 035-3

(Please open up the fold-back cover at the front of this manual).

Only parts with order numbers are available separately.

1 Piston

0.1 – 2.5 µL	22 47 506-1
0.5 – 10 µL	22 47 508-8
2 – 20 µL	22 47 510-0
10 – 100 µL incl. piston seal (4)	22 47 512-6
50 – 200 µL incl. piston seal (4)	22 47 514-2
100 – 1000 µL incl. piston seal (4)	22 47 518-5
500 – 2500 µL incl. piston seal (4)	22 47 520-7

2	Piston spring	
	100 – 1000 µL	22 47 524-0
	500 – 2500 µL	22 47 526-6
3	Clamp	
4	Piston seal	
	10 – 100 µL incl. screw (8), spring (9)	22 47 528-2
	50 – 200 µL with two O-rings	22 47 530-4
	100 – 1000 µL incl. screw (8), spring (9), ejector seal (10)	22 47 534-7
	500 – 2500 µL incl. screw (8), spring (9), ejector seal (10)	22 47 536-3
5	Lower housing	
6	Ejector, includes ejector spring (7)	
	0.1 – 2.5 µL incl. ejector tube	22 47 538-0
	0.5 – 10 µL incl. ejector tube	22 47 538-0
	2 – 20 µL incl. ejector tube	22 47 538-0
	10 – 100 µL incl. ejector tube	22 47 540-1
	50 – 200 µL	22 47 544-4
	100 – 1000 µL	22 47 548-7
	500 – 2500 µL	22 47 550-9
7	Ejector spring (0.1 – 2.5, 0.5 – 10, 2 – 20, 10 – 100 µL includes ejector tube)	
8	Screw for nose cone	
9	Nose cone spring	
10	Ejector seal	
11	Nose cone, complete	
	0.1 – 2.5 µL incl. seal	22 47 552-5
	0.5 – 10 µL incl. seal	22 47 554-1
	2 – 20 µL gray, incl. seal	22 47 556-8
	2 – 20 µL yellow, incl. seal	22 47 558-4
	10 – 100 µL incl. (8), (9), (4), (12)	22 47 562-2
	50 – 200 µL incl. (12), (14)	22 47 564-9
	100 – 1000 µL incl. (8), (9), (10)	22 47 570-3
	500 – 2500 µL incl. (8), (9), (10)	22 47 572-0

12 Reducing tube (5 pieces, 1 wire punch)	
10 – 100 µL	22 47 574-6
50 – 200 µL incl. 2 pieces of (14)	22 47 576-2
13 Ejector sleeve	
0.1 – 2.5 µL	22 47 582-7
0.5 – 10 µL	22 47 582-7
2 – 20 µL	22 47 582-7
10 – 100 µL	22 47 582-7
50 – 200 µL	22 47 584-3
100 – 1000 µL	22 47 586-0
500 – 2500 µL	22 47 588-6
14 Damping tube	
Lower part , complete, includes piston and (3) – (14)	
0.1 – 2.5 µL	22 47 590-8
0.5 – 10 µL	22 47 592-4
2 – 20 µL gray	22 47 594-1
2 – 20 µL yellow	22 47 596-7
10 – 100 µL	22 47 600-9
50 – 200 µL	22 47 602-5
100 – 1000 µL	22 47 608-4
500 – 2500 µL	22 47 610-8
Series 2000 Reference repair kit	22 47 504-5
(1 tube of silicone lubricant, 1 wrench, 6 blank labels, 1 wire punch, 1 reducing tube each for 10 – 100 µL and 50 – 200 µL, for 50 – 200 µL, 1 damping tube)	
Silicone lubricant for piston	22 34 850-7
Wrench	22 47 502-9

III. Pipette tips

Bulk, 1000 tips per bag:

2.5 µL	22 35 142-7
20 µL	22 35 156-7
200 µL	22 35 130-3
1000 µL	22 35 090-1
2500 µL (500 pcs.)	22 35 086-2

Enviroset

1 Envirobox, autoclavable, plus 7x96 Envirotips in racks:

2.5 µL	22 49 049-4
20 µL	22 49 050-8
200 µL	22 49 055-9
1000 µL	22 49 060-5
2500 µL (7x48 pcs.)	22 49 070-2

Envirotips in racks, 10x96= 960 tips:

2.5 µL	22 49 039-7
20 µL	22 49 040-1
200 µL	22 49 042-7
1000 µL	22 49 044-3
2500 µL (480 pcs.)	22 49 046-0

Enviroboxes

1 Envirobox plus 96 Envirotips

2.5 µL	22 49 079-6
20 µL	22 49 080-0
200 µL	22 49 085-1
1000 µL	22 49 090-7
2500 µL (48 pcs.)	22 49 100-8

Eppendorf Biopur pipette tips,

colorless, sterile, pyrogen-free, DNA-free, RNase-free, ATP-free
in autoclavable boxes, 5x96= 480 tips

20 µL	22 49 000-1
200 µL	22 49 002-8
1000 µL	22 49 006-1
2500 µL (144 pcs.)	22 49 010-9

Series 2000 Reference® – Part B – Ordering information

Eppendorf Biopur pipette tips, individually wrapped,

1 case = 100 tips

200 μL	22 49 004-4
1000 μL	22 49 008-7

Filtertips, sterile, in boxes, 5x96= 480 tips

10 μL	22 49 030-3
100 μL	22 49 032-0
1000 μL	22 49 034-6

GELoader Tips

(for Series 2000 Reference variable 0.5 μL – 10 μL)

1 case = 200 tips	22 35 165-6
Carousel stand	22 44 500-6



Please only use the accessories recommended by eppendorf.

Using spare parts and disposables which we have not recommended can reduce the precision, accuracy and life of the pipette. We do not honor any warranty or accept any responsibility for damage resulting from such action.