

# Pos-D™

## Positive-Displacement Pipette for Problem Liquids

**Continuously-  
adjustable**

**6 models with  
volume ranges  
from  
0.5 to 1000  $\mu$ L**

Pos-D 250  $\mu$ L shown



**RAININ**

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## Introduction

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Pos-D is a new positive displacement pipette from Rainin for demanding biological protocols and for use with liquids with non-aqueous properties: e.g. viscous, dense, volatile, or high-surface-tension liquids. Positive-displacement pipettes have certain advantages over air-displacement pipettes for these applications:

- Concerning DNA amplification protocols, the positive-displacement Pos-D absolutely prevents sample-to-sample contamination from aerosols. Disposable capillaries and pistons prevent contamination from carry-over from one sample or reagent to another. Each capillary and piston is used only once and ejected without hand contact.
- Concerning non-aqueous samples, because the piston is in direct contact with the sample (no partial vacuum), viscous, dense, volatile, or high-surface-tension liquids are measured accurately and reproducibly.

## Description

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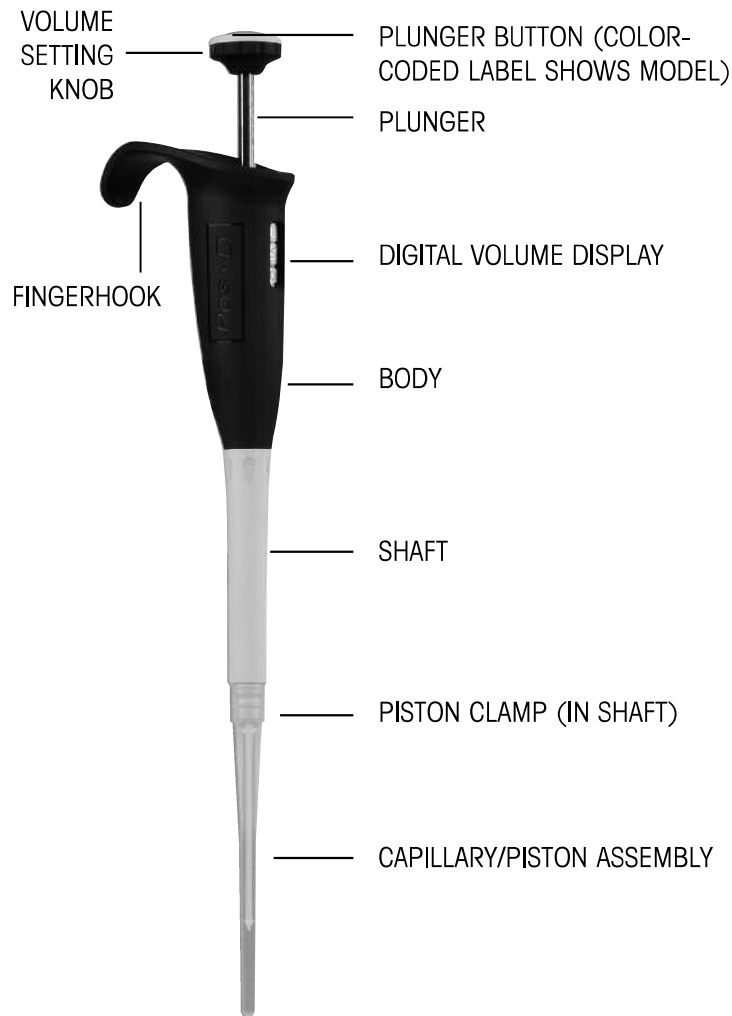


Figure 1 Pos-D 250 µL

### Additional features:

Permanent calibration.

The digital volume setting allows precise and continuous adjustment, and faces the user during the pipetting operation.

No lubrication or maintenance is required.

The fingerhook allows you to rest your hand and reduces pipetting static forces.

## Contents

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Pos-D pipette as ordered	
Capillaries/Pistons	ID tags
Rainin Test Report	This manual

## Note on Calibration and Operation

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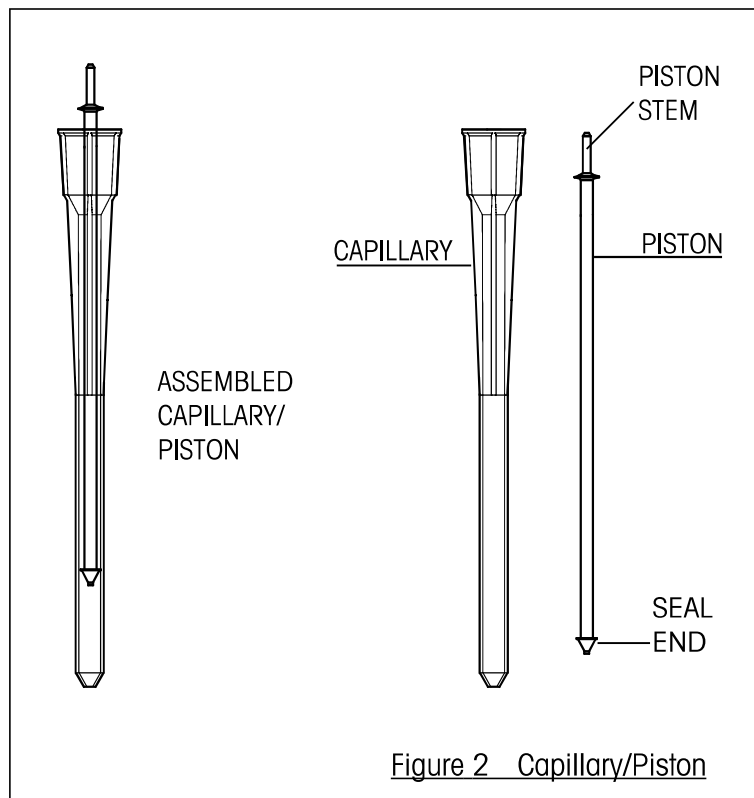
Pos-D is calibrated at Rainin during manufacture.

When the capillary/piston assembly is correctly fitted, the pipette will perform to the accuracy and precision specification as indicated in this manual.

## Capillary/Piston Assembly

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Pos-D capillaries/pistons are supplied already assembled, pre-sterilized, in racks. The following drawing shows the parts assembled and as they would appear if unassembled. (250  $\mu$ L shown, other volumes are similar.)



## Attaching the Capillary/Piston Assembly

Pos-D capillaries/pistons are supplied already assembled and pre-sterilized.

- 1 Open the capillary/piston rack. Press the plunger button fully down to the 2ND STOP (see Fig 5.). The piston clamp will be open, protruding from the end of the shaft. Figure 3A below.
- 2 Align the piston clamp into the capillary so that the piston clamp engages the piston stem. Figure 3B below.
- 3 Slowly release the plunger, while pushing Pos-D down until the capillary snaps into place on the shaft. See Figure 3C below, and note that there is a small gap between the end of the piston clamp and the "shoulder" on the piston.
- 4 To make sure the piston is properly seated and the pipette is in proper calibration, press lightly on the plunger button until you hear and feel a click as the gap shown in Figure 3C is adjusted.

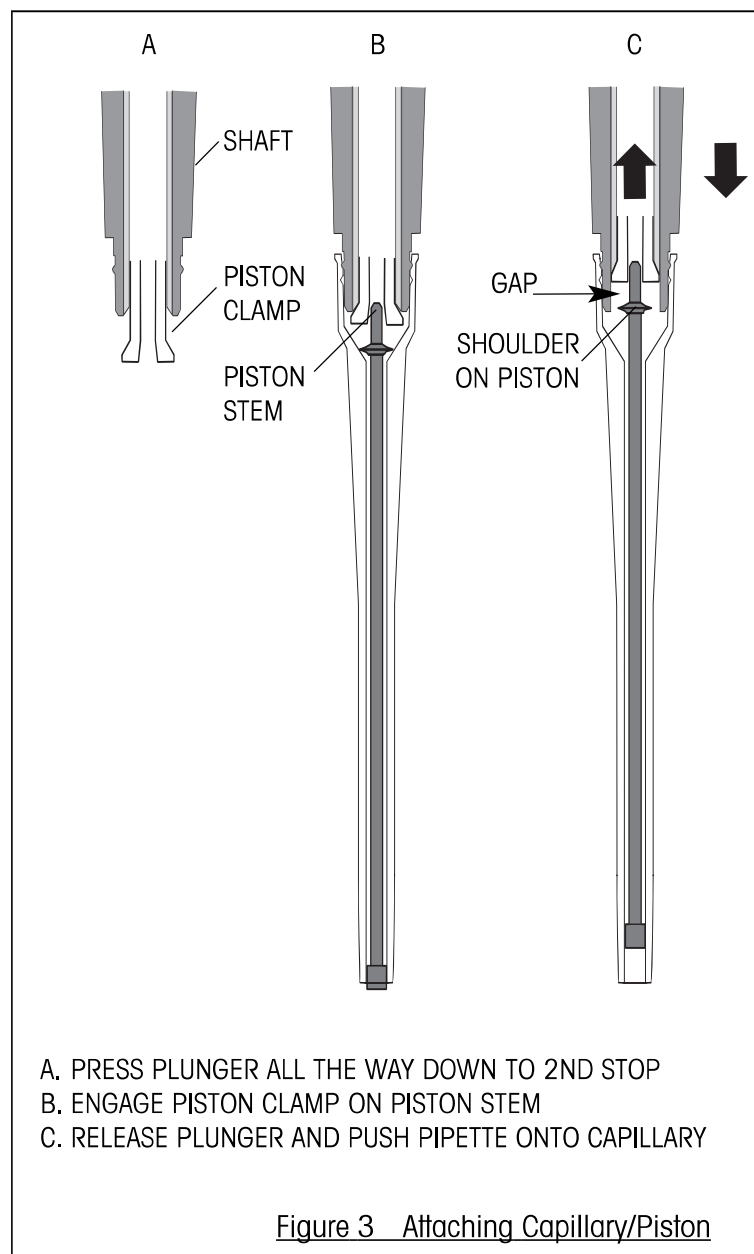


Figure 3 Attaching Capillary/Piston

## Volume Ranges

Pos-D Model	Capillary/Piston	Increment (µL)	Volume Range (µL)	# of Turns in Range
10 µL	CP-10	0.02	0.5–10	10
25 µL	CP-25	0.02	3–25	25
50 µL	CP-50	0.05	20–50	25
100 µL	CP-100	0.2	10–100	10
250 µL	CP-250	0.2	50–250	25
1000 µL	CP-1000	2	100–1000	10

## Setting Volume

Volume setting is done by turning the volume setting knob slowly and reading the volume on the display. The display consists of three number wheels and is read from top to bottom. The digits are black and/or red, as follows:

Model Volume	Black Digits	Red Digits
10 µL, 25 µL, 50 µL	1 µL	0.1 µL
100 µL, 250 µL	1 µL	--
1000 µL	0.1 and 0.01 mL	1 mL

Pos-D Model					
10 µL	25 µL	50 µL	100 µL	250 µL	1000 µL
0	1	2	0	2	0
7	2	5	7	2	7
5	5	0	5	5	5
7.5 µL	12.5 µL	25 µL	75 µL	225 µL	0.75 mL
Volume Set			<b>BLACK DIGITS</b> RED DIGITS		

Figure 4 Volume Display

To eliminate errors due to mechanical backlash: when setting a larger volume, first turn the knob 1/3 turn above the desired volume. Then turn the knob slowly clockwise until the desired volume is displayed. If setting a smaller volume, simply turn the volume setting knob slowly until the desired setting is reached.

**Always dial down to the desired volume.**

## Pre-rinsing

Before pipetting, pre-rinse the capillary/piston twice. Press the plunger button to the FIRST STOP and insert the capillary about 2-3 mm into the sample. Slowly release the plunger to allow the sample to pre-rinse the capillary/piston.

Press the button to the FIRST STOP again to return the sample to the reservoir.

## Pipetting

**To Pick up Sample:** Press the plunger button to the FIRST STOP. Insert the capillary into the sample for each volume:

**10-250 µL: 2-3 mm**

**1000 µL: 3 mm**



Slowly release the plunger to move the piston upward and draw the sample into the capillary to the desired volume.

When removing the capillary from the sample, touch it against the vessel wall to remove any sample from the outside of the capillary.

**To dispense sample:**

Touch the end of the capillary against the inside wall of the receiving vessel.

Press the plunger button slowly to the FIRST STOP.

Holding the plunger button down, move the capillary away from the vessel wall, then remove the pipette completely from the vessel and release the plunger button.

**To eject the capillary/piston:**

Over a suitable waste container, press the plunger button to the FIRST STOP, then through to the SECOND STOP: see figure 5. The capillary and piston will be ejected into the waste container.

**GLP (Good Laboratory Practices)**

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Pos-D allows easy maintenance of GLP records according to your SOPs (standard operating procedures):

- 1. **Serialized pipettes:** Serial No. on pipette and Test Report.
- 2. **Bar coding:** On the Rainin Test Report and pipette box label.
- 3. **ID tag:** Useful to record the application or user.

Additionally, there is:

**No sample-to-sample contamination:** Capillary/Piston is used once then discarded.

**No aerosol contamination:** Positive displacement eliminates aerosol contamination.

**No hand contact:** Capillaries and Pistons are loaded and ejected without hand contact.

## Troubleshooting

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**Leaking from the capillary:** Change the capillary/piston assembly and make sure it is seated properly; see page 3.

**Piston does not move when you release the plunger button:** Piston is not attached correctly to the piston clamp. Attach as described on page 3.

**Difficult to fit capillary:** Clean the end of the shaft and piston clamp with isopropyl alcohol and a lint-free cotton swab.

**Inaccurate or non-reproducible results:** Change the capillary/piston assembly and make sure it is seated properly; page 3.

**If any problem persists, or if you see other problems, call 800-543-4030 (Technical Support)**

## Cleaning your pipette

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The piston clamp should never be lubricated. If this area requires cleaning, use a lint-free cotton swab with isopropyl alcohol only.

**Cleaning:** Do not use any aggressive solvents which could attack the plastic parts when cleaning Pos-D. Only use a mild detergent. The external parts can easily be cleaned using a soft cloth or soft brush and soap solution. After cleaning, rinse well with distilled water and allow to dry thoroughly.

**Decontamination:** If it is necessary to decontaminate Pos-D, use hand, body, and eye protection, and exercise extreme care. Follow standard safety procedures of your institution.

Wipe the body with a soft cloth or lint-free tissue wetted with decontaminant. Soak immersible parts (piston clamp, shaft, and shaft spring) in the decontaminant solution, or wipe them according to instructions given with the decontaminant.

Rinse well with distilled water and allow to dry thoroughly.

## Storage

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After use, store the pipette in a clean safe place. The Pos-D pipette is a precision instrument and should be treated with the level of care appropriate for laboratory instrumentation.

Several hangers are available to hold your Pos-D conveniently and safely when not in use:

**GR-3:** Clear stand holds 3 pipettes.

**CR-7:** Free-standing carousel holds seven pipettes.

**HU-M3:** Set of three individual magnetic Hang-Ups™ for mounting on ferrous surfaces.

**HU-S3:** Three Hang-Ups attached to a shelf clamp.



## Service, Calibration and Repair

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**RAININ** Pipette Repair and Calibration facilities:

**California:**

7500 Edgewater Drive, Oakland CA 94621  
Tel. 800-662-7027, Fax 510-564-1683

5955 Mira Mesa Blvd, Ste B, San Diego, CA 92121  
Tel. 858-320-0443, Fax 858-320-0556

**Massachusetts:** Rainin Road, Woburn, MA 01801

Tel. 800-662-7027, Fax 781-935-7631

**Japan:** 4-1-11, Bunkyo-Ku, Tokyo 113-0033

Tel. (03) 5689-8311, Fax (03) 5689-2670

**Canada:** 6419 Northam Drive, Mississauga, Ontario L4V 1J2

Tel. 800-662-7027, Fax 866-758-3991

**METTLER TOLEDO** Pipette Repair and Calibration facilities:

**Belgium:** N.V. Mettler-Toledo s.a., B-1932 Zaventem

Tel. (02) 334 02 11, Fax (02) 334 03 34

**Germany:** Mettler-Toledo GmbH, D-35353 Giessen

Tel. (0641) 50 70, Fax (0641) 507 128

**Denmark:** Mettler-Toledo A/S, DK-2600 Glostrup

Tel. (43) 270 800, Fax (43) 270 828

**Spain:** Mettler-Toledo S.A.E., E-08038 Barcelona

Tel. (93) 223 76 00, Fax (93) 223 02 71

**France:** HTS – F-28000 Chartres

Tel. (02) 37 88 31 00, Fax (02) 37 88 31 09

**Italy:** Mettler-Toledo S.p.A., I-20026 Novate Milanese

Tel. (02) 333 321, Fax (02) 356 29 73

**Netherlands:** Mettler-Toledo B.V., NL-4004 JK Tiel

Tel. (0344) 638 363, Fax (0344) 638 390

**Sweden:** Mettler-Toledo AB, S-12008 Stockholm

Tel. (08) 702 50 00, Fax (08) 642 45 62

Service is also available in many other countries through authorized RAININ distributors. See [www.rainin-global.com](http://www.rainin-global.com).

For pipettes under warranty, please note that the warranty will be voided if the pipette has been damaged as a result of physical or chemical abuse, or if the pipette has been repaired or recalibrated by any service facility which is not authorized by Rainin.

Call Technical Support 800-543-4030 for further information.

## Specifications

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These manufacturer's specifications should be used as guidelines when establishing your own performance specification.

Pos-D Model	Volume $\mu\text{L}$	Accuracy		Precision	
		%	$\mu\text{L} (\pm)$	%	$\mu\text{L} (\leq)$
10 $\mu\text{L}$	1	9.0	0.09	3.0	0.03
	5	2.0	0.10	0.6	0.03
	10	1.5	0.15	0.6	0.06
25 $\mu\text{L}$	3	8.3	0.25	2.6	0.08
	10	2.7	0.27	0.8	0.08
	25	1.2	0.30	0.4	0.10
50 $\mu\text{L}$	20	1.7	0.34	1.0	0.20
	50	1.4	0.70	0.6	0.30
100 $\mu\text{L}$	10	5.0	0.50	2.0	0.20
	50	1.5	0.75	0.6	0.30
	100	1.0	1.00	0.4	0.40
250 $\mu\text{L}$	50	3.0	1.50	0.6	0.30
	100	1.7	1.70	0.3	0.30
	250	1.0	2.50	0.2	0.50
1000 $\mu\text{L}$	100	3.0	3.00	1.6	1.60
	500	1.0	5.00	0.5	2.50
	1000	0.8	8.00	0.4	4.00

Specifications by gravimetric method using distilled water at  $21.5^{\circ}\text{C} \pm 1.0^{\circ}\text{C}$ . Subject to change without notice.

Specifications are guaranteed when using Rainin Capillaries/Pistons.

## Replacement Parts

The following parts are user-replaceable. Call 800-472-4646 to order replacement parts.

	10 $\mu$ L	25 $\mu$ L	50 $\mu$ L	100 $\mu$ L	250 $\mu$ L	1000 $\mu$ L
Plunger Button	6193-072	6193-073	6193-074	6193-075	6193-076	6193-077
Shaft	6193-067	6193-068	6193-068	6193-067	6193-068	6193-068
Shaft Spring	6193-069	6193-069	6193-069	6193-069	6193-069	6193-069
Piston Clamp	6193-070	6193-070	6193-070	6193-070	6193-070	6193-071

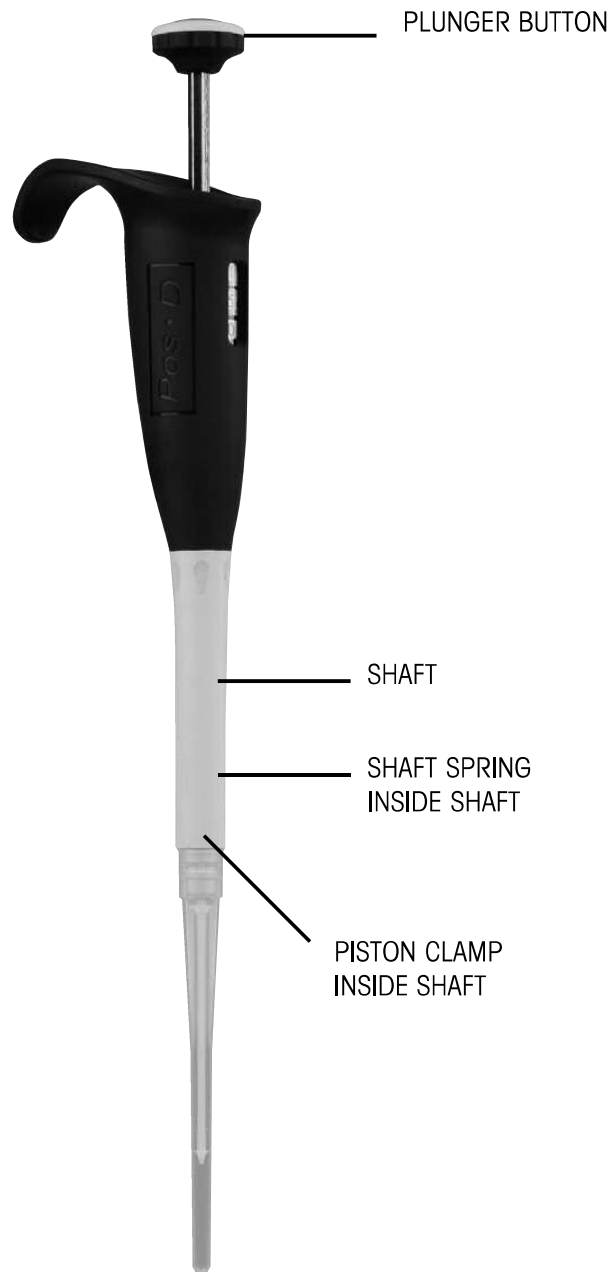


Figure 6 Replacement Parts

### Limited Warranty

See the enclosed Limited Warranty and Limitations of Liability Statement. Please complete and return the Warranty Registration Card on receipt of your pipette.

RAININ pipettes are calibrated with RAININ tips. To assure excellent reproducibility and performance, use only RAININ tips as recommended in this manual. Specified performance is guaranteed only when RAININ tips are used.

### Contacting RAININ

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#### Technical Information:

Phone: 800-543-4030  
Fax: 510-564-1617  
E-mail: tech.support@rainin.com

#### Pipette Service:

Phone: 800-662-7027  
Fax: 510-564-1683  
E-mail: service@rainin.com

#### Direct Order Line:

Phone: 800-472-4646  
Fax: 510-564-1617  
E-mail: pipets@rainin.com

**Web:** [www.rainin.com](http://www.rainin.com)

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#### From outside the U.S.:

Phone: +1-510-564-1600

#### RAININ Japan:

Phone: + 81 3 5689-8311  
Fax: + 81 3 5689-2670

#### METTLER TOLEDO GmbH, Switzerland

Phone: +41 1 944 45 45  
Fax: +41 1 944 45 10

Other International Offices and Distributors:

See [www.rainin-global.com](http://www.rainin-global.com)

**E-mail:** [global@rainin.com](mailto:global@rainin.com) (from outside the U.S.)

**Web:** [www.rainin-global.com](http://www.rainin-global.com) (from outside the U.S.)

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# RAININ

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