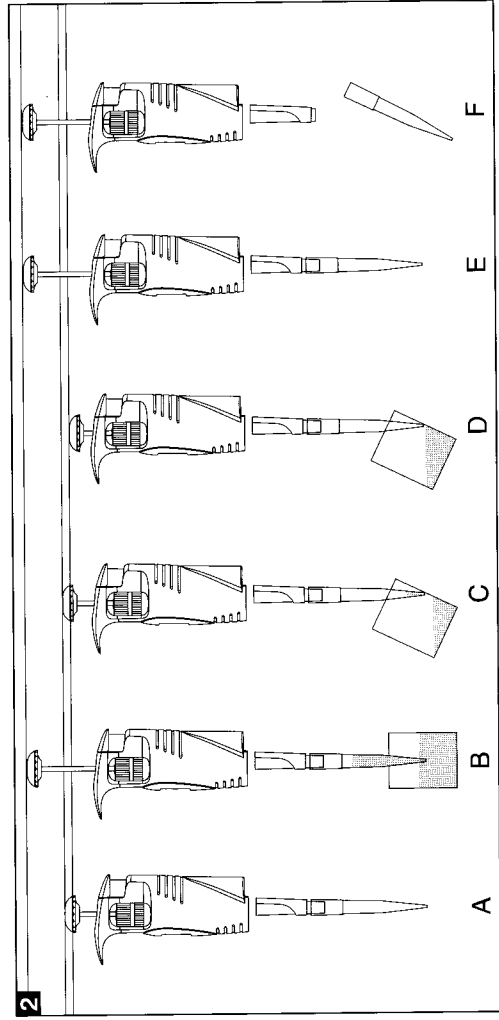
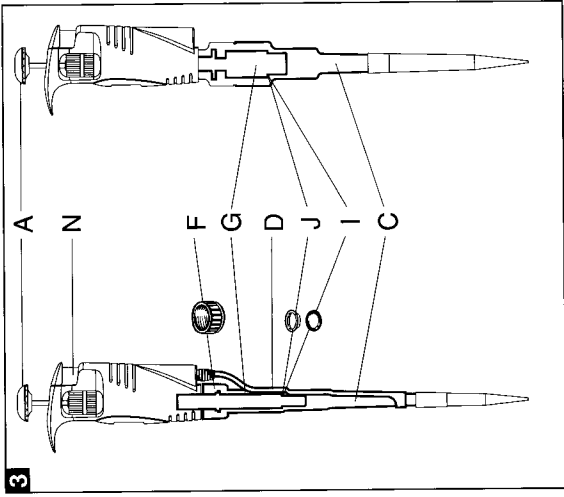
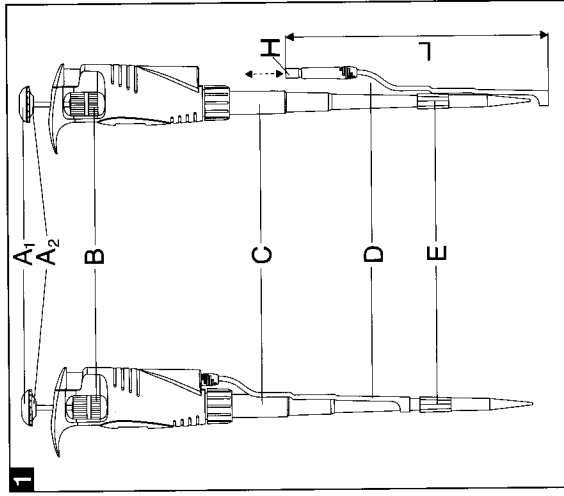


VWR Signature™ Pipettor



VWR Signature™ Pipettor

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1 – INTRODUCTION

The **VWR Signature™ Pipettor** is a volumetric instrument designed to measure and transfer liquids precisely and safely. These variable volume pipettors cover the range from 0.1 µl to 5000 µl in nine models. **VWR Signature™ Pipettors** are supplied with tip ejector, designated as “VE” or without a tip ejector, “V”.

The **VWR Signature™ Pipettors** have a digital counter displaying the set volume. The set volume is visible in the window situated in the hand grip of the pipettor. Volume is adjusted by turning the pipetting pushbutton (Fig 1A2) or by turning the black knurled adjustment ring (Fig 1B). The volume range of the pipettor is shown on the pushbutton (Fig 1A1).

Model	Volume range [µl]
VWR VE2/V2	0.1 - 2
VWR VE10/V10	0.5 - 10
VWR VE20/V20	2 - 20
VWR VE50/V50	5 - 50
VWR VE100/V100	10 - 100
VWR VE200/V200	20 - 200
VWR VE250/V250	50 - 250
VWR VE1000/V1000	100 - 1000
VWR VE5000/V5000	1000 - 5000

VWR VE2/V2, VWR VE10/V10	Measurement and transfer of micro-volumes, DNA sequencing and enzyme-assay applications.
VWR VE20/V20, VWR VE50/V50, VWR VE100/V100, VWR VE200/V200, VWR VE250/V250, VWR VE1000/V1000	Measurement and transfer of general aqueous solution, acids and bases
VWR VE5000/V5000	Measurement and transfer of large volumes

The **VWR Signature™ Pipettors** use disposable polypropylene tips, fig 1E. Disposable tips eliminate cross contamination between samples and ensure maximum user safety. The tip ejector built in to the VE series protects the user from contamination when removing the tips.

The VE series features an adjustable, removable tip ejector. The tip ejector adjusts to accommodate a wide variety of tips. When pipetting in narrow tubes, it may be necessary to remove the tip ejector. To remove, grasp the ejector by the finger grip located near where the ejector attaches to the body of the pipettor. While pressing down on the ejector button, pull the ejector down.

Adjusting Tip Ejector Length

- Models VWR VE2 to VWR VE1000 pipettors (Fig. 5A):

The interchangeable “H” spacers provided with the pipettor allow for adjusting the length of the tip ejector by +1mm or +2mm. The pipettors are supplied with the H0 spacer in place. To change the spacer, remove the ejector as described above. Replace the H0 spacer with either the H1 or H2 spacer. Reverse the removal process to fit the ejector back in place.

VWR Signature™ Pipettor

assemble the shaft and to rinse the piston and seal with distilled water after finishing the pipetting operation.

8 - RECALIBRATION

The pipettor is calibrated by gravimetric method, using distilled water, at the temperature 20 ± 1 °C, according to ISO 8655 and DIN 12650.

If during pipettor operation you find that the accuracy error (the difference between the real aspirated volume and the preset volume) exceeds the permissible value given in the table in section 1, the pipettor recalibration procedure should be carried out.

Before starting the recalibration it is necessary to check whether the following requirements have been fulfilled during error determination:

- the ambient temperature, and the temperature of the pipettor, tips and water was identical
- the density of the liquid used was close to that of distilled water
- the balance with appropriate sensitivity has been used

Volume checked [µl]	Balance sensitivity [mg]
0.1 - 10	≤ 0.001
10 - 100	≤ 0.01
> 100	≤ 0.1

- mg/µl conversion factor has been taken into account
- the requirements given in sections 3 and 7 have been fulfilled

If the above conditions are satisfied and the accuracy error for selected volume given in section 1 exceeds the permissible value, the pipettor recalibration procedure should be carried out.

The recalibration can be performed within one full turn of the key to the right or to the left only.

Recalibration conditions:

- Ambient temperature and the temperature of the pipettor, tips and liquid should be within the range 20-25°C and stabilized during weighing within ± 0.5 °C
- Measurements should be conducted using distilled water
- Balance sensitivity should be suitable for the volume to be controlled.

Recalibration procedure:

- Set the dose volume depending on the pipettor volume according to the following table:

Model	Range of the pipette volumes [µl]	Preset volume [µl]	Permissible volumes [µl]	Volume change ΔV for full turn of the calibration key [µl] (24 increments)
VWR VE2V2	0.1 - 2	0.2	0.176 - 0.224	0.06
VWR VE10V10	0.5 - 10	0.5	0.48 - 0.52	0.33
VWR VE20V20	2 - 20	2	1.92 - 2.08	0.63
VWR VE50V50	5 - 50	5	4.875 - 5.125	2.50
VWR VE100V100	10 - 100	10	9.84 - 10.16	2.50
VWR VE200V200	20 - 200	20	19.76 - 20.24	6.30
VWR VE250V250	50 - 250	50	49.5 - 50.5	6.30
VWR VE1000V1000	100 - 1000	100	99.1 - 100.9	25.00
VWR VE5000V5000	1000 - 5000	1000	994 - 1006	125.00

- Perform 5 aspirations, weigh each one and calculate the average value of the aspirations
- Calculate average aspirated volume in µl multiplying the average aspiration amount [mg] by the distilled water density coefficient [µl/mg], which depends on temperature and pressure according to the following table:

Temperature [°C]	Pressure [hPa]	
	960	1013
20	1.0028	1.0029
21	1.0031	1.0032
22	1.0032	1.0033
23	1.0035	1.0036
24	1.0037	1.0038
25	1.0039	1.0040