

High level



**VWR**  <sup>TM</sup>  
**Pipettor.**

**Instruction Manual**

VWR™ Variable Volume Digital Pipettors cover the range from 0.1 µl to 5000 µl.

VWR™ Fixed Volume Pipettors are available in standard volumes from 5 µl to 3000 µl.



VWR™ Pipettors accept white, yellow or blue



The simplest and recommended method to verify the performance of the pipette is the gravimetric method. The procedure involves measuring the weight of water at a known temperature to determine the dispensed volume.



is preferable of suitable sensitivity. The chart below

- 4. Aspirate a set volume of water from the reservoir.
- 5. Check that the balance is zeroed.
- 6. Remove the weighing vessel from the balance.

TROUBLESHOOTING

Symptom	Cause	Solution
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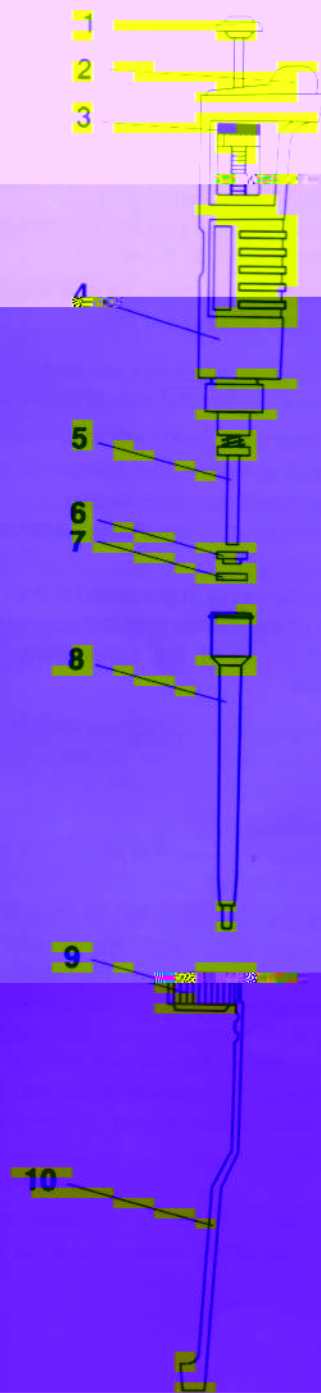


Fig. 2

Order From VWR International  
**Call 800-932-5000**  
 from anywhere in the U.S. and Canada



## DEFINITIONS AND FORMULAE

**Accuracy** is defined as a measure of the mean of the volume delivered minus the nominal value expressed as a percentage.

$$A = \frac{M - V}{V} \times 100$$

Where:

- V – nominal value of the pipettor in  $\mu\text{l}$
- x – mean volume delivered by the pipettor in  $\mu\text{l}$
- A – accuracy expressed as a percent

**Standard deviation** is the measure of the scatter of the observations around the mean.

$$SD = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

## RECALIBRATION

Before starting the recalibration procedure, the pipette should be calibrated with distilled water at temperature 20 $\pm$ 1°C according to DIN 12550.

If during pipette operation you find that the accuracy from the first difference between the real dispensed volume and the nominal (in volume) exceeds the permissible value given in the Technical Data chart, the pipette 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 empty burette

and

or

the pipette has not been used according to

- mg/ $\mu\text{l}$  conversion factor has

not

been taken into account.

• Coefficient of variation of compression is the same

and

• The pipette is used

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