

# omniPETTE



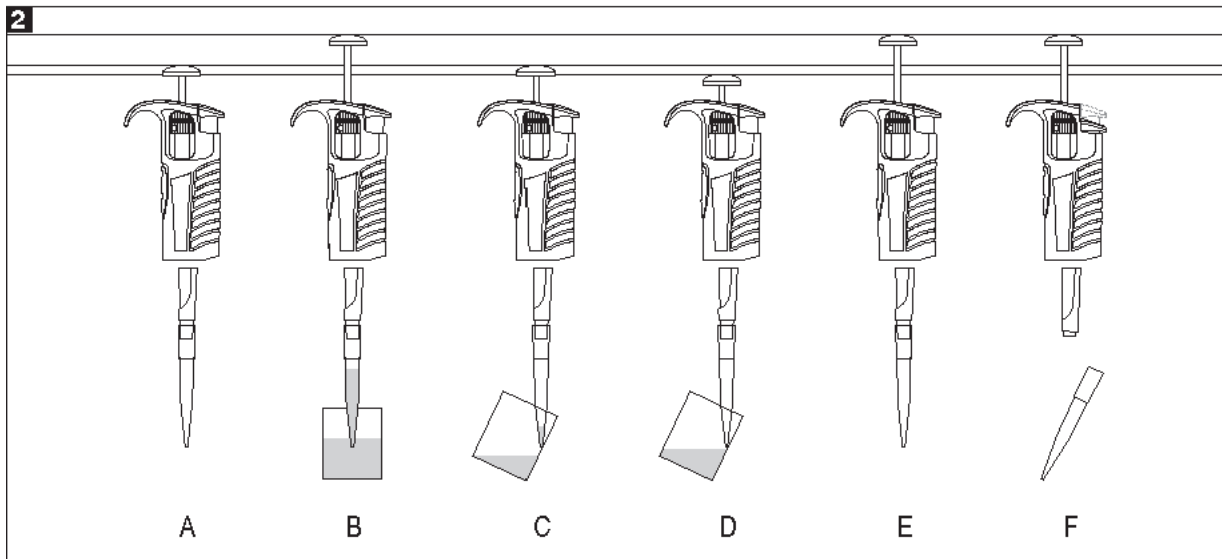
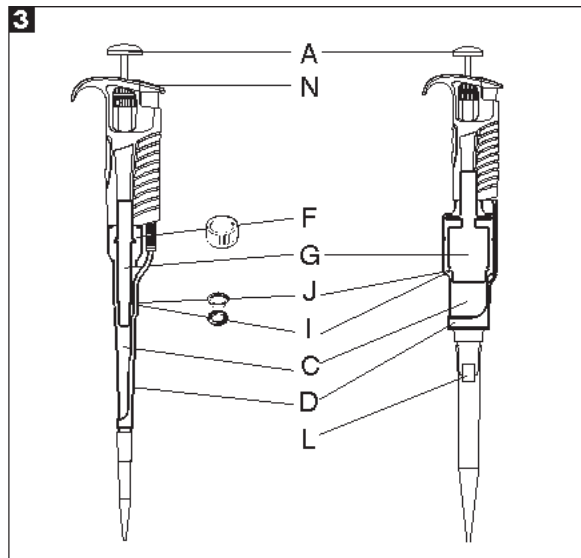
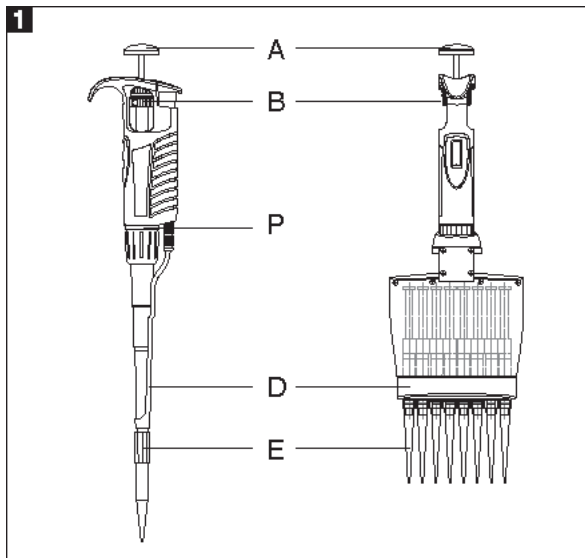
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# omniPETTE



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## 1 - INTRODUCTION

The **omniPETTE** is a volumetric instrument designed to measure and transfer liquids precisely and safely. It can measure and transfer volumes from 0.1  $\mu\text{l}$  to 10000  $\mu\text{l}$  depending on the model.

The multichannel pipettes have been designed for the filling of laboratory microplates. The pipettes enable precise and simultaneous delivery of 8 or 12 preset-volume doses of liquid. The multichannel pipettes are produced in four ranges of volumes: 0,5-10  $\mu\text{l}$ , 5-50  $\mu\text{l}$ , 20-200  $\mu\text{l}$ , 50-300  $\mu\text{l}$ .

The **omniPETTE** pipettes are equipped with a digital counter which shows the pipetting volume. The volume is adjusted by turning the black knurled adjustment ring, (Fig.1B), and is continuously adjustable within the volume range for the pipette. The maximum volume of the pipette is shown on the side surface of the handle.

The liquid is aspirated into disposable tips attached to the pipette shaft. Disposable tips ensure maximum safety and eliminate possibility of crosscontamination of the liquid samples.

To protect the user from contaminated tips the **omniPETTE** is equipped with a built-in tip ejector, (Fig.1D).

The construction of the ejector enables the user to set up the length. The adjustable tip ejector accommodates every variety of tips available on the market. When using narrow tubes, it may be necessary to remove the tip ejector. It is simply removed by pulling down.

### Single channel pipette's ejector

#### Adjusting of the Tip Ejector Length

- in 2-1000  $\mu\text{l}$  pipettes (Fig. 6A).

The regulated "H" spacers, allow for regulating the length of tip ejector by +1 mm or +2 mm. An "H0" spacer is inserted on a standard basis. The outside shape of the spacer identifies the adjustment.

- in 5000 and 10000  $\mu\text{l}$  pipettes (Fig. 6B).

The length of tip ejector is regulated by screwing in or screwing out the tip ejector stem with a screwdriver. Turn the screwdriver counter clockwise to increase the length of tip ejector, and clockwise to reduce the length of tip ejector. The ejector can be adjusted in the range of 5 mm. If above described method of ejector adjustment is not sufficient or the diameter of the ejector opening is too large to dispose the tip it is necessary to put the ejector cap "M" onto the ejector, (Fig. 6C).

- in 2 and 10  $\mu\text{l}$  pipettes (Fig. 6D)

The 2  $\mu\text{l}$  - 10  $\mu\text{l}$  pipettes may require the use of an ejector cap "M" to efficiently eject certain brands of pipette tips. Simply place the cap on the bottom of the pipette shaft and slide the cap upwards until it surrounds the bottom of the tip ejector.

## Multichannel pipette's ejector

The multichannel pipette construction allows to rotate the multichannel module and to eject the tips through 360°, therefore, the most convenient position may be selected to fill the microplates. It is recommended to turn the module clockwise. Due to the long stroke of the ejector in the multichannel pipette, the adjustment of its length is not necessary.

The **omniPETTE** is a high quality instrument which offers excellent accuracy and precision.

The accuracy and precision (repeatability) of liquid volume depend on the quality of tips used. The values for accuracy and precision given in the table below were obtained using **CLEAVER Sci.** tips. Only those tips guarantee correct operation of the pipettes and ensure accuracy and precision of liquid sampling.

## The single channel pipettes

Model	Cat. no.	Volume [µl]	Accuracy [%]	Precision [%]	Tip µl
CV2	5651	0.2 1.0 Max 2.0	± 12.0 ± 2.7 ± 1.5	± 6.0 ± 1.3 ± 0.7	10 µl
CV10	5652	Min 0.5 5.0 Max 10.0	± 4.0 ± 1.0 ± 0.5	± 2.8 ± 0.6 ± 0.4	
CV20	5653	Min 2 10 Max 20	± 3.0 ± 1.0 ± 0.8	± 1.5 ± 0.5 ± 0.3	200 µl
CV50	5657	Min 5 25 Max 50	± 2.5 ± 1.0 ± 0.8	± 2.0 ± 0.6 ± 0.4	
CV100	5654	Min 10 50 Max 100	± 1.6 ± 0.8 ± 0.8	± 0.80 ± 0.24 ± 0.20	
CV200	5655	Min 20 100 Max 200	± 1.2 ± 0.8 ± 0.6	± 0.60 ± 0.25 ± 0.20	
CV250	5650	Min 50 125 Max 250	± 1.0 ± 0.8 ± 0.6	± 0.4 ± 0.3 ± 0.3	300 µl
CV1000	5656	Min 100 500 Max 1000	± 1.6 ± 0.7 ± 0.6	± 0.40 ± 0.20 ± 0.15	1000 µl

Model	Cat. no.	Volume [µl]	Accuracy [%]	Precision [%]	Tip µl
CV5000	5658	Min 1000 2500 Max 5000	± 0.6 ± 0.6 ± 0.5	± 0.25 ± 0.20 ± 0.15	5000 µl
CV10000	5659	Min 1000 5000 Max 10000	± 2.5 ± 0.8 ± 0.5	± 0.6 ± 0.3 ± 0.2	10000 µl

## The multichannel pipettes

SPECIFICATIONS					
Model	Cat. no.	Volume [µl]	Accuracy [%]	Precision [%]	Fit to tips µl
CV8-10 CV12-10	6275	Min 0.5 5 Max 10	±10.0 ±4.0 ±2.0	± 8.0 ± 2.0 ± 1.2	10
CV8-50 CV12-50	6276	Min 5 25 Max 50	±4.0 ±3.0 ±1.6	± 2.5 ± 1.2 ± 0.6	200
CV8-200 CV12-200	6277	Min 20 100 Max 200	±3.0 ±1.5 ±1.0	± 1.5 ± 0.8 ± 0.6	
CV8-300 CV12-300	6278	Min 50 150 Max 300	±1.6 ±1.2 ±1.0	± 1.5 ± 1.0 ± 0.6	200

The accuracy and precision are obtained with **CLEAVER Sci.** tips, using a gravimetric method, performing at least 10 measurements of distilled water at a temperature of 20±1°C, according to EN ISO 8655 standard.

The pipette design enables the user to perform the recalibration process according to the rules presented in section 8.

## 2 - SETTING THE VOLUME

The volume display consists of three numbers and is read from top to bottom. The three numbers indicate the volume selected and are colored black and red.

Red numbers represent decimal fractions in micro volume pipettes or milliliters in macro volume pipettes.

*AN EXAMPLE FOR EACH OF THESE PIPETTES IS GIVEN BELOW*

## The single channel pipettes

Model	Counter readings	Set volume	Basic degree
2	$\begin{array}{ c } \hline 1 \\ \hline 2 \\ \hline 5 \\ \hline \end{array}$	1.25 $\mu$ l	0,002 $\mu$ l
10	$\begin{array}{ c } \hline 0 \\ \hline 7 \\ \hline 5 \\ \hline \end{array}$	7.5 $\mu$ l	0.02 $\mu$ l
20	$\begin{array}{ c } \hline 1 \\ \hline 2 \\ \hline 5 \\ \hline \end{array}$	12.5 $\mu$ l	0.02 $\mu$ l
100	$\begin{array}{ c } \hline 0 \\ \hline 7 \\ \hline 5 \\ \hline \end{array}$	75 $\mu$ l	0,2 $\mu$ l
200	$\begin{array}{ c } \hline 1 \\ \hline 2 \\ \hline 5 \\ \hline \end{array}$	125 $\mu$ l	0,2 $\mu$ l
1000	$\begin{array}{ c } \hline 0 \\ \hline 7 \\ \hline 5 \\ \hline \end{array}$	0.75 ml	2 $\mu$ l
5000	$\begin{array}{ c } \hline 1 \\ \hline 2 \\ \hline 5 \\ \hline \end{array}$	1.25 ml	10 $\mu$ l
10000	$\begin{array}{ c } \hline 0 \\ \hline 7 \\ \hline 5 \\ \hline \end{array}$	7.5 ml	20 $\mu$ l

## The multichannel pipettes

Model	Counter readings	Set volume	Basic degree
CV8-10 CV12-10	$\begin{array}{ c } \hline 0 \\ \hline 3 \\ \hline 5 \\ \hline \end{array}$	3.5 $\mu$ l	0.02 $\mu$ l
CV8-50 CV12-50	$\begin{array}{ c } \hline 0 \\ \hline 6 \\ \hline 5 \\ \hline \end{array}$	6.5 $\mu$ l	0.10 $\mu$ l
CV8-200 CV12-200	$\begin{array}{ c } \hline 0 \\ \hline 8 \\ \hline 5 \\ \hline \end{array}$	85.0 $\mu$ l	0.20 $\mu$ l
CV8-300 CV12-300	$\begin{array}{ c } \hline 2 \\ \hline 5 \\ \hline 0 \\ \hline \end{array}$	250.0 $\mu$ l	1.0 $\mu$ l

To attain the maximum accuracy, set volume must be approached from a higher value.

If the desired value is lower than the previous value, simply adjust the value down to 1/3 turn above the required setting. If the desired value is higher than the previous value, adjust the value to 1/3 turn above the required value. The setting should then be performed in the following manner:

Slowly turn the pipetting pushbutton or the black adjustment knob to the required volume.

If the knob is accidentally turned too far, below the required value, the process must be repeated.

Following volume adjustment, set the locking ring into the upper position, thus locking the knob and preventing accidental volume change.

### 3 - ASPIRATING AND DISPENSING LIQUIDS

#### The single channel pipettes

Place a tip on the shaft of the pipette. See section 6 for the appropriate tip. Press the tip on firmly using a slight twisting motion to ensure a positive, airtight seal.

#### The multichannel pipettes

In order to put tips on the multichannel shafts hold the pipette vertically and press it against the tips in the rack box, until the shafts retract about 1.5 mm into the multichannel module. The suspension system of the shafts ensures even and tight sealing of tips. The rocking movement does not have to be performed to seal the tips tightly.

#### Aspiration

Press the pushbutton to the first positive stop, (Fig. 2A). Holding the pipette vertically, immerse the tip into the sample liquid. The depth to which the tip is immersed in the sample liquid depends on the model.

Model	Immersion depth (mm)
CV2	$\leq 1$
CV10	$\leq 1$
CV20, CV50, CV100	2 ÷ 3
CV200, CV250, CV1000	2 ÷ 3
CV5000	3 ÷ 6
CV10000	5 ÷ 7

Release the pushbutton slowly and smoothly to aspirate the sample, (Fig. 2B). Wait one second and then withdraw the tip from the liquid. When the pipette tip is immersed not as deeply as the recommended depth or when the pipetting pushbutton is rapidly released air may enter the disposable tip.

**Avoid touching the orifice of the tip.**

## Dispensing

- Place the end of the tip against the inside wall of the vessel at an angle of 10 to 40 degrees.
- Press the pushbutton smoothly to the first stop, (Fig. 2C). Wait one second.
- Press the pushbutton to the second stop to expel any remaining liquid, (Fig. 2D).
- Keeping the pushbutton depressed to the very end, remove the pipette by drawing the tip against the inside surface of the receiving vessel.
- Release the pushbutton to its starting position, (Fig. 2E).
- Eject the tip by pressing the tip ejector button, (Fig. 2F). Remember to change the tip whenever a different kind of liquid is to be sampled.

## Filters

Replaceable filter installed in a seat in the bottom part of the shaft is used in 5000  $\mu\text{l}$  and 10000  $\mu\text{l}$  pipettes (Fig. 3L). The filter prevents the aspirated liquid from entering into the shaft and thus from polluting the inside of the shaft and the piston. Using the filter is especially important when aspirating and dispensing large volumes of liquid.

If the filter becomes wet during liquid aspiration it should be replaced with a new one.

## 4 - PRE-RINSING

When pipetting liquids of higher viscosity or lower surface tension than water (e.g. sera or organic solvents), a film of liquid is formed on the inside wall of the pipette tip. This film can create an error. Since the film remains relatively constant in successive pipetting operations with the same tip, this error can be avoided by forming the film before transferring the first sample. This is done by aspirating a sample and dispensing it back into the same vessel. Since the film is already formed, all of the follow-

ing samples will have better accuracy and repeatability.

This pre-rinsing operation should be repeated when the volume to be aspirated is changed or when a new tip is used.

## 5 - DENSE AND VISCOUS LIQUIDS

The **omniPETTE** specifications of accuracy and precision are based on pipetting distilled water. The handling of liquids with physical qualities of density, viscosity and surface tension differing extremely from water may need a gravimetrically checked compensation of the volume setting. Normally the degree of error resulting from heavy or viscous liquids is negligible if the pipetting is done slowly and carefully. It is most important to give the liquids some time to follow the change of pressure by holding the pipette tip in its position for at least 2 sec. after the aspiration and the blow out stroke.

If in extreme cases this method of operation does not result in accurate values, a compensation could be achieved as follows:

Weigh the liquid pipetted when the **omniPETTE** is set to the nominal value. Then calculate the set-off from the nominal value:

$$\text{Corr. val.} = 2 \times \text{nom. val.} - \frac{m}{\gamma}$$

$m$  - weight of the sample

$\gamma$  - density of liquid

Check this operation once again and correct if necessary. Note the corrected value for further pipetting the same kind of liquid.

## 6 - CLEAVER PIPETTE TIPS

**CLEAVER** tips are made from high performance polypropylene and their quality guarantees the precision and accuracy associated with the **omniPETTE**. Strict control is maintained throughout the manufacturing process to ensure the highest quality.

The accuracy and precision figures for the **omniPETTE** are only guaranteed when **CLEAVER** tips are used. The use of inferior quality tips will seriously degrade the performance of the **omniPETTE**.

## Tips 10

These tips are used for volumes between 0.1  $\mu\text{l}$  and 10  $\mu\text{l}$ . They are used with the CV2, CV10, CV8-10 and CV12-10 models.

## Tips 200

These tips are used for volumes between 2  $\mu\text{l}$  and 200  $\mu\text{l}$ . They are used with the CV20, CV100, CV200, CV8-50, CV12-50, CV8-200 and CV12-200 models.

## Tips 300

These tips are used for volumes between 50  $\mu\text{l}$  and 250  $\mu\text{l}$ . They are used with the CV250, CV8-300 and CV12-300 models.

## Tips 1000

These tips are used for volumes between 100  $\mu\text{l}$  and 1000  $\mu\text{l}$ . They are used with the CV1000 models.

## Tips 5000

These tips are used for volumes between 1000  $\mu\text{l}$  and 5000  $\mu\text{l}$ . They are used with the CV5000 models.

## Tips 10000

These tips are used for volumes between 1000 and 10000  $\mu\text{l}$ . They are used with the CV10000 models.

## 7 - RECOMMENDATIONS

Observing the following recommendations will ensure maximal possible accuracy and precision of liquid sampling.

- Make sure to operate the **omniPETTE** slowly and smoothly.
- The depth of immersion in the sample liquid should be the minimum necessary and should remain constant during aspiration.
- The **omniPETTE** should be held in a vertical position.
- Change the tip when volume setting is changed or when a different liquid is to be aspirated.
- Change the tip if a droplet remains on the end of the tip from the previous pipetting operation.
- Each new tip should be pre-rinsed with the liquid to be pipetted.

- Liquid should never enter the **omniPETTE** shaft. To prevent this:
  - Press and release the pushbutton slowly and smoothly.
  - Never turn the pipette upside down.
  - Never lay the pipette on its side when there is liquid in the tip.
- Never force the volume setting beyond its recommended limits.
- When pipetting liquids with temperatures different from the ambient temperature, it is recommended to pre-rinse the tip several times before use.
- Do not pipette liquids with temperatures above 70°C.
- When pipetting acids or corrosive solutions which emit vapours, it is recommended to disassemble the shaft and to rinse the piston and seal with distilled water after finishing the pipetting operation.

## 8 - RECALIBRATION

**CLEAVER** pipettes are calibrated by gravimetric method, using **CLEAVER** tips and distilled water, at the temperature  $20 \pm 1^\circ\text{C}$ , according to EN ISO 8655 standard.

If during pipette 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 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 pipette, tips and water was identical
- the density of the liquid used is close to that of distilled water
- the balance with appropriate sensitivity has been used.

Volume checked [ $\mu\text{l}$ ]	Balance sensitivity [mg]
0,1 - 10	$\leq 0,001$
10 - 100	$\leq 0,01$
> 100	$\leq 0,1$

- mg/ $\mu\text{l}$  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 pipette 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 pipette, tips and liquid should be within the range 20-25°C and stabilised during weighing within  $\pm 0.5^\circ\text{C}$
- 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 pipette volume according to the following table:

#### The single channel pipettes

Model	Range of the pipette volumes [ $\mu\text{l}$ ]	Preset volume [ $\mu\text{l}$ ]	Permissible volumes [ $\mu\text{l}$ ]	Volume change $\Delta V$ for full turn of the calibration key [ $\mu\text{l}$ ] (24 increments)
CV2	0.1 - 2	0.2	0.176 - 0.224	0.06
CV10	0.5 - 10	0.5	0.48 - 0.52	0.33
CV20	2 - 20	2	1.94 - 2.06	0.63
CV50	5 - 50	5	4.875 - 5.125	2.50
CV100	10 - 100	10	9.84 - 10.16	2.50
CV200	20 - 200	20	19.76 - 20.24	6.30
CV250	50 - 250	50	49.5 - 50.5	6.30
CV1000	100 - 1000	100	98.4 - 101.6	25.00
CV5000	1000 - 5000	1000	994 - 1006	125.00
CV10000	1000 - 10000	1000	975 - 1025	250.00

- Perform 5 aspirations, weigh each one and calculate the average value of the aspirations

#### The multichannel pipette

Model	Range of the pipette volumes [ $\mu\text{l}$ ]	Preset volume [ $\mu\text{l}$ ]	Permissible volumes [ $\mu\text{l}$ ]	Volume change $\Delta V$ for full turn of the calibration key [ $\mu\text{l}$ ] (24 increments)
CV8-10 CV12-10	0.5 - 10	0.5	0.45 - 0.55	0.33
CV8-50 CV12-50	5 - 50	5	4.8 - 5.2	1.67
CV8-200 CV12-200	20 - 200	20	19.4 - 20.6	6.30
CV8-300 CV12-300	50 - 300	50	49.2 - 50.8	10.00

- Perform three aspiration series (each series should include the aspirations from all channels), weigh each time and calculate the average value of the aspirations.
- Calculate average aspirated volume in  $\mu\text{l}$  multiplying the average aspiration amount [mg] by the distilled water density coefficient [ $\mu\text{l}/\text{mg}$ ], which depends on temperature and pressure according to the following table:

Temperature [ $^\circ\text{C}$ ]	Pressure [kPa]		
	95.0	101.3	105.0
20	1.0028	1.0029	1.0029
21	1.0030	1.0031	1.0031
22	1.0032	1.0033	1.0033
23	1.0034	1.0035	1.0036
24	1.0037	1.0038	1.0038
25	1.0039	1.0040	1.0040

If the average aspirated volume exceeds the permissible value, the following should be done:

- Remove the pipetting pushbutton, (Fig. 4A),
- Holding the volume setting knob to protect it against rotation, insert the calibration key into the cuts of the calibration screw, (Fig. 4B),
- Turn the key clockwise to reduce the aspirated volume, or counter-clockwise to increase the volume, (Fig. 4C).



One full turn of the calibration key changes the pipette aspiration volume by the amount given in the table.

- Take out the key and fix the pipetting pushbutton (Fig. 4D).

Determine the average aspirated volume. The average volume should be within the permissible range given in the table. If the volume exceeds the values stated, the recalibration procedure should be repeated.

In case of pipetting the liquids with physical properties considerably different from those of water, follow the rules given in section 5.

## 9 - TROUBLESHOOTING

If you notice an improper pipette operation identify the cause and eliminate the fault. Doing this, follow the instruction in the sequence provided. Replacement of elements into new ones may be required only exceptionally, and should not occur under normal pipette use.

### **Bubbles of liquid remain in the pipette tip.**

- The tip is emptied too fast.  
**Decrease the speed of pressing the pipette pushbutton.**
- The tip wettability has increased due to extensive use.  
**Replace the tip with a new one.**

### **Droplets of air appear in the liquid aspirated into the tip.**

- The pipette tip immersion is too shallow.  
**Immerse the tip deeper according to the instructions.**
- The aspiration of the liquid was done too fast  
**Release the pushbutton slowly and smoothly**
- The pipette tip is incorrectly pressed onto the pipette shaft.  
**Press the pipette firmly.**
- The tip is damaged or worn out due to extensive use.  
**Replace the tip with a new one.**

### Single channel pipette

### **The pipette incorrectly aspirates the liquid or liquid drops out from the tip.**

- The pipette tip is incorrectly pressed onto the pipette shaft.

### **Press the pipette tip firmly.**

- The shaft nut is loose (Fig. 3F).  
**Tighten the shaft nut.**
- The sealing surface of the shaft is cracked or scored.  
**Remove the tip ejector. Unscrew the shaft nut, inspect the shaft and the piston assembly. Replace the damaged parts (see section 12). When reassembling the pipette, the nut should be hand tightened. In the models CV2, CV10 and CV20, the damage of the shaft may also cause a damage of the piston assembly. Replace the damaged parts (see section 12). When reassembling the pipette, the nut should be hand tightened.**  
**To remove the tip ejector in models CV5000 and CV10000, remove the ejector pushbutton (Fig. 3N) and using a screwdriver unscrew the tip ejector by turning the screwdriver counter-clockwise.**
- Damage of the piston or seal due to prolonged use with aggressive liquids.  
**Disassemble the pipette as described above. Replace the piston, seal and O-ring (see section 12). Rinse the inside of the shaft in distilled water and dry. Lubricate the seal and O-ring with the lubricant. The replacement of the piston requires conducting of calibration procedure.**  
**Note: The parts of CV2 and CV10, pipette should be lubricated evenly with the minimum amount of lubricant.**
- The pipette is reassembled improperly.  
**Disassemble the pipette and reassemble it, observing the proper sequence of steps (Fig. 3).**
- No lubricant on the sealing elements.  
**Remove the tip ejector. Unscrew the shaft nut, remove the shaft, piston assembly, seal and O-ring. Rinse the removed parts in distilled water and dry thoroughly. Lightly lubricate the inside surfaces of the seal and the O-ring with the lubricant. Reassemble the pipette in the reverse order.**
- Contamination of the inside of the pipette caused by extensive aspiration of chemically aggressive liquids or because liquid got inside the pipette.  
**Remove the tip ejector. Unscrew the nut, remove the shaft, piston assembly, seal and O-ring. Rinse**

*the removed parts with distilled water and dry thoroughly. Lightly lubricate the inside surfaces of the seal and the O-ring with the lubricant. Reassemble the pipette in the reverse order.*

**Note:**

**Pipettes can be autoclaved (see section 10).**

**The shaft of the 5000 and 10000 models should be autoclaved without the filter.**

If the pipette malfunction persists after carrying out the above steps, send the pipette to your **CLEAVER Sci.** service representative.

Before returning the pipette, make sure that it is free from any chemical, radioactive or microbiological contamination that might pose any danger during transportation and repairing. Clean the pipette as thoroughly as possible.

## 10 - CLEANING AND STERILIZATION

**Cleaning:**

External surfaces of the pipetting pushbutton, the ejector pushbutton, the handgrip, the shaft nut and the adjustment knob may be cleaned using a cloth dampened in isopropyl alcohol. The remaining parts removed from the pipette during pipette disassembly may be washed with distilled water or isopropyl alcohol.

**Sterilization:**

The pipette can be sterilized in the autoclave at 121°C for 20 minutes. After sterilization, the pipette should be dried and cooled to room temperature.

**It is recommended:**

- to sterilize the pipettes in autoclave with an initial vacuum and drying cycle,
- prior to sterilization unscrew the shaft nut slightly in the pipettes. After autoclaving these parts should be screwed tight again.
- prior to sterilization the multichannel pipette unscrew the nut connecting the handle and module slightly. After autoclaving these parts should be screwed tight again.

**The shaft of the 5000 and 10000 models should be autoclaved without the filter.**

The precision of the results should not alter if the pipetting process and autoclaving are carried out as described in this manual. Because a slight change in the accuracy of the dosage may occur, it is recommended to:

- check the calibration of the pipette after the initial first, third and fifth autoclaving cycles and then after every 10 autoclaving cycles.

## 11 - PIPETTE KIT

The pipettes are delivered in the kits including:

- Pipette
- Instruction manual
- Calibration key

**Note:**

The following parts are not part of the standard equipment of the pipette and are available upon request:

- Ejector cap (for pipette models CV2, CV10, CV5000 und CV10000)
- Pipette stand
- Lubricant
- Filters (for pipette models CV5000, CV10000)
- Color identification rings
- Ejector regulation spacers (for pipette models CV2 - CV1000)

## 12 - SPARE PARTS AND ACCESSORIES

All the spare parts and accessories indicated in Fig. 3, 4, 5 and 6:

**A: Pushbutton**

**B: Adjustment knob**

**C: Shaft**

**D: Ejector**

**E: Pipette tip**

**F: Shaft nut**

**G: Piston assembly**

**H: Spacer**

**I: O-ring**

**J: Seal**

**K: Calibration key**

**L: Filter**

**M: Ejector cap**

**N: Ejector pushbutton**

**P: Identification ring**

**S: Pipette holder**

The holder assembly diagram is shown in Fig. 5.

Spare parts and accessories can be ordered from your **CLEAVER Sci.** representative (type of pipette and name of the part for this pipette should be specified).

**Warning: The replacement of the piston requires conducting of calibration procedure according to section 8.**

# omniPETTE

