

PA Series PA-10/20/200/1200/10000
Single Channel Electronic Pipettes
Supplementary Instruction Manual

The PA Series is equipped with the following operation modes when there is a requirement for higher order dispensing operation.

1. Introduction

This document provides supplementary information for the operation modes listed below which have been added to the PA Series of electronic pipettes.

1) Dispensing and mixing mode (AUTO+MIX)

By combining Standard mode (AUTO) and Mixing mode (MIX), the pipette can continue to mix the substance after the standard dispensing operation has been completed.

It is possible to individually set the dispensing amount, number of mixes and mixing volume.

2) Sequential aspirating mode (SA) (SA: Sequential Aspirating)

Different types of liquid can each be aspirated at individually set volumes, then dispensed all together.

3) Sequential dispensing mode (Sd) (Sd: Sequential Dispensing)

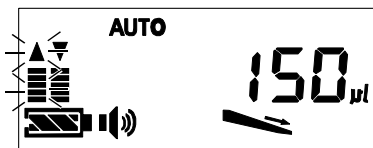
Aspirated liquid can be sequentially dispensed at individually set volumes.

2. Explanation of each operation mode

2-1. Dispensing and mixing mode (AUTO+MIX)

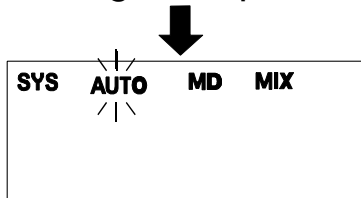
1) Selection and setting method for Dispensing and mixing mode

The example below uses the PA-200 and mixes 200 μL (100 μL of liquid dispensed into 100 μL prepared earlier) 10 times.

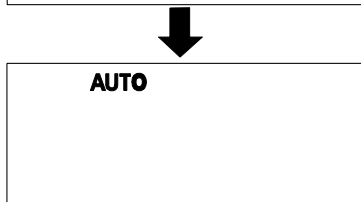



(Example of initial display)

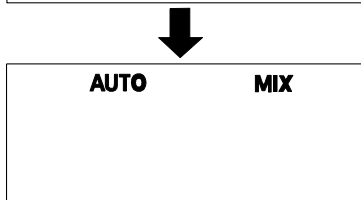
Setting example starts below




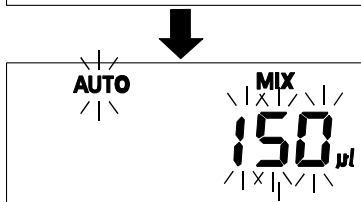
[1] Press the  Back key.




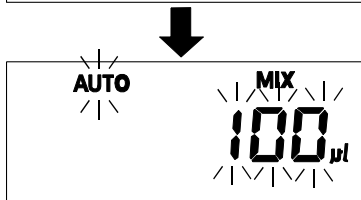
[2] Select "AUTO" using the  Up/Down key.




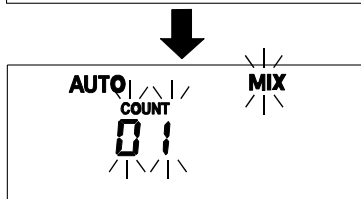
[3] In "AUTO" mode hold the  Enter key down for around 3 seconds.




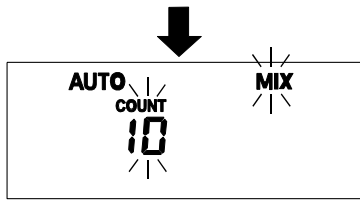
[4] Stop pressing the  Enter key.




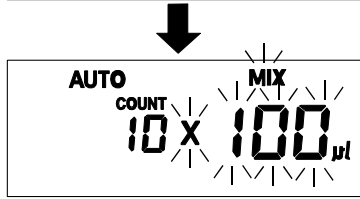
[5] Set the dispensing amount using the  Up/Down key.



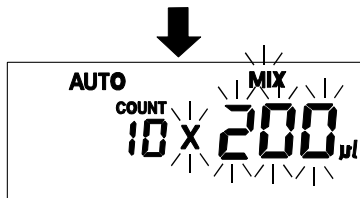
[6] The dispensing amount is determined by pressing the  Enter key.




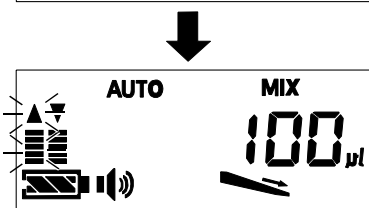
[7] Set the number of mixes using the  Up/Down key.



[8] The number of mixes is determined by pressing the  Enter key.

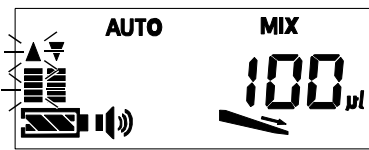



[9] Set the mixing volume using the  Up/Down key.

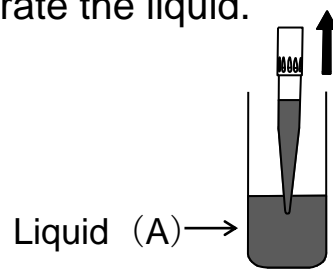
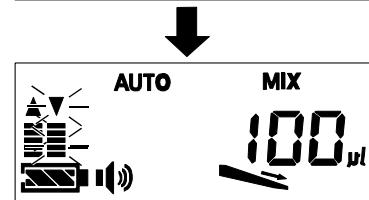



[10] The mixing volume is determined by pressing the  Enter key.

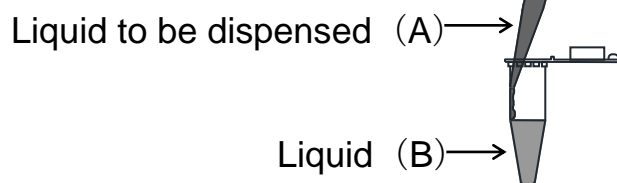
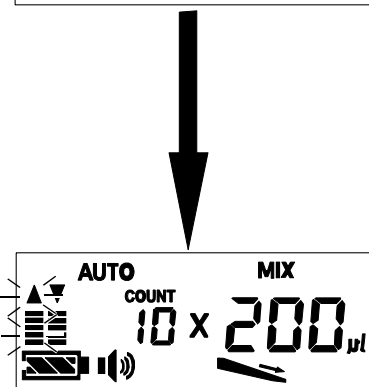
2) Operation method for Dispensing and mixing mode

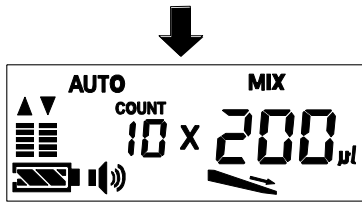



[1] After placing the end of the tip into the liquid to be dispensed (A), press the  Operation key on the body of the pipette to aspirate the liquid.

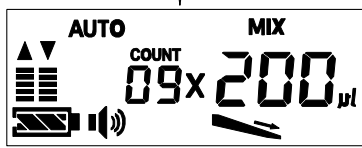
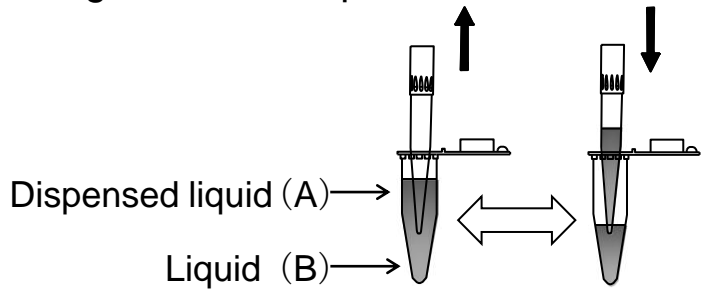


[2] After putting the end of the tip into the vessel containing liquid for mixing (B), press the  Operation key to dispense the aspirated liquid (A)

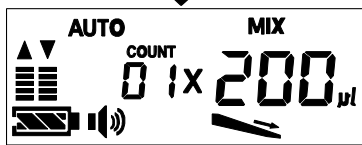




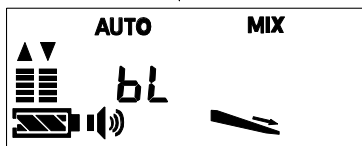
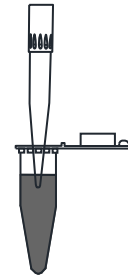
[3] Put the end of the tip into the combined liquid for mixing (A, B). When the  Operation key is pressed, the set mixing volume is aspirated.





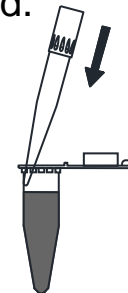
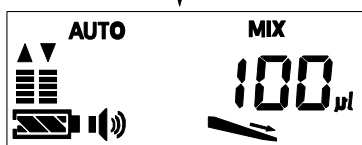
[4] The combined liquid (A,B) will be mixed by repeating the aspiration/discharge of around 2/3 of the combined liquid for the set number of mixes.



[5] Once the mixing process has been completed, a buzzer will sound once.



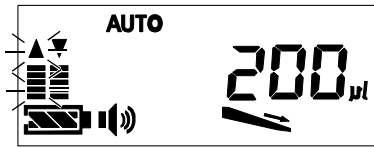
[6] Discharge the liquid remaining in the tip by pressing the  Operation key (when the blowout function is  on). The mixed liquid will be completely discharged and the dispensing and mixing operation completed.



When the operation is complete, the buzzer will sound twice.

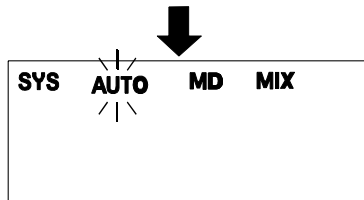
2-2. Sequential Aspirating mode (SA)

1) Selection and setting method for Sequential Aspirating mode

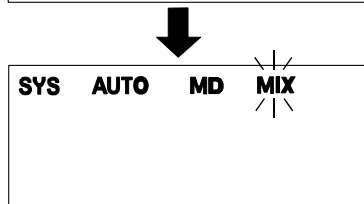


(Example of initial display)

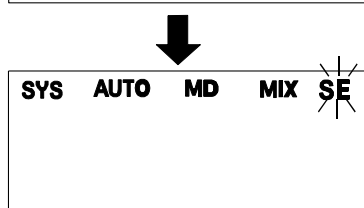
Setting example starts below



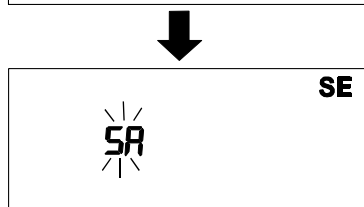
[1] Press the ◀ Back key.



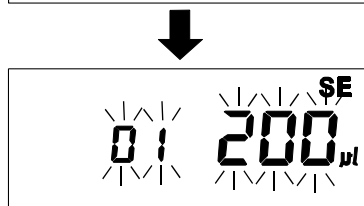
[2] Select "MIX" using the ⬆ Up/Down key.



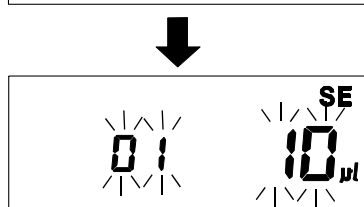
[3] After holding down the ⬆ Up key for about 3 seconds, "SE" will start flashing.



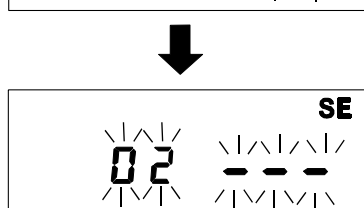
[4] After pressing the ▶ Enter key, "SE" will fully light up and "SA" will start flashing.



[5] In the "SA" display, press the ▶ Enter key.

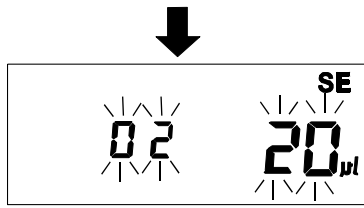



[6] Using the ⬆ Up/Down key, set the volume of the liquid to be aspirated first (A).
(In the example, 10 μL is set)

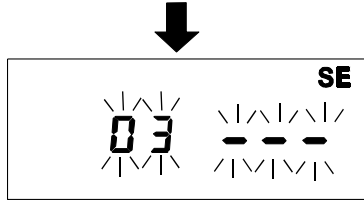



[7] The volume to be aspirated first is determined by pressing the ▶ Enter key.

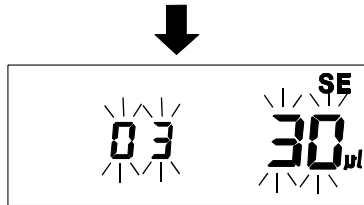




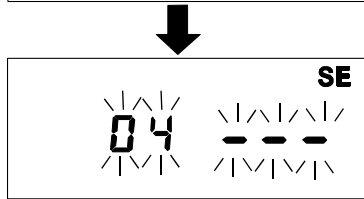
[8] Set the volume of the liquid to be aspirated the second time (B) using the  Up/Down key.
(In the example, 20 μ L is set)




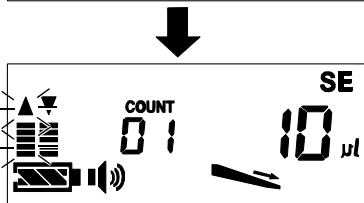
[9] The volume to be aspirated second is determined by pressing the  Enter key.



In a similar manner, set the further required aspiration volumes in the correct sequence.



For example, when 3 types of liquid are to be aspirated, in order to not aspirate a 4th time, when “04” is flashing, press the  Enter key when the set volume appears as “---”.

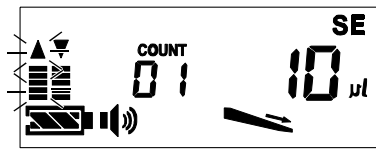



- Except for the PA -1200 and the PA-10000, when aspirating, an air gap will be aspirated between each liquid.
- Aspiration amount for each air gap

PA -10	PA -20	PA -200	PA -1200 PA-10000
0.1 μ L	2.0 μ L	20 μ L	Does not aspirate air gaps

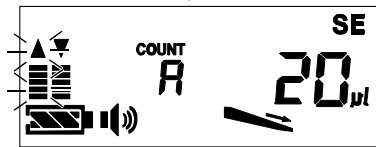
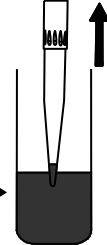
- If the total volume of all liquids and air gaps is greater than the maximum volume of the PA pipette, it cannot be set.


2) Operation method for SA mode (when using PA-200)



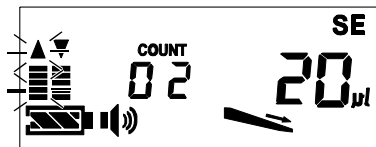
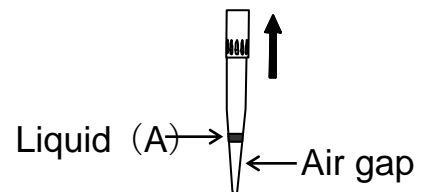
[1] Put the end of the tip in the liquid to be aspirated first (A), and aspirate by pressing the  Operation key.


Liquid first aspirated (A) →



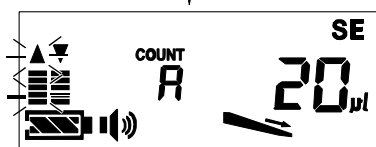
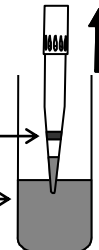
[2] Remove the tip from the liquid and aspirate air by pressing the  Operation key.


(Except for the PA -1200 and the PA-10000)



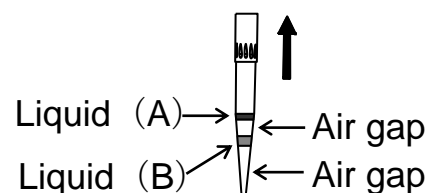
[3] Put the end of the tip into the liquid to be aspirated second (B), and aspirate by pressing the  Operation key.

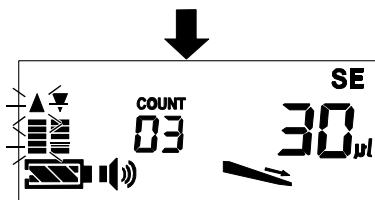
Liquid aspirated first (A) →
Liquid to be aspirated second (B) →




[4] Remove the tip from the liquid and aspirate air by pressing the  Operation key.

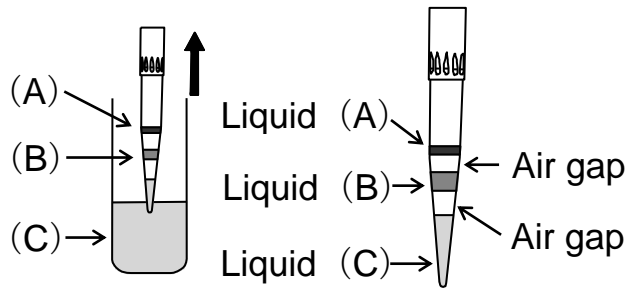
(Except for the PA -1200 and the PA-10000)



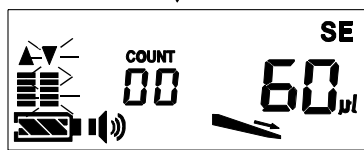



[5] Put the end of the tip in the liquid to be aspirated third (C), and aspirate by pressing the  Operation key.

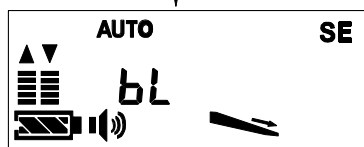
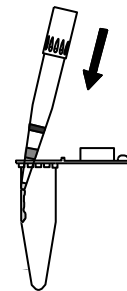
Liquid aspirated 1st (A)
 Liquid aspirated 2nd (B)
 Liquid to be aspirated 3rd (C)





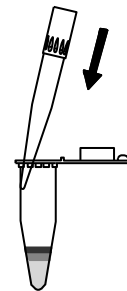
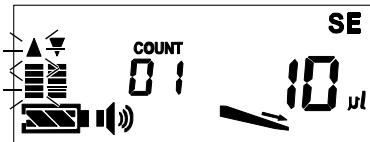
Once the set number of aspirations has been completed, the total aspirated volume is displayed. (The volume of the air gaps is not included.)



[6] Put the end of the tip into the vessel and discharge the liquids (A,B,C) all together by pressing the  Operation key.

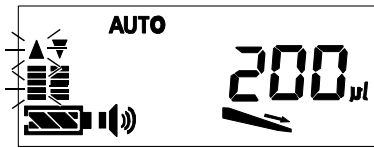


[7] Discharge the liquid remaining in the tip by pressing the  Operation key. (when blowout function is  on)



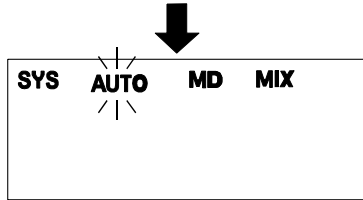
2-3. Sequential Dispensing mode (Sd)

1) Selection method for Sequential Dispensing mode

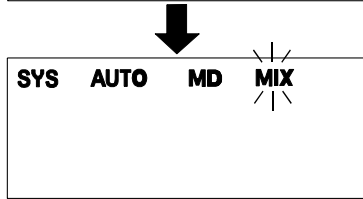



(Example of initial display)

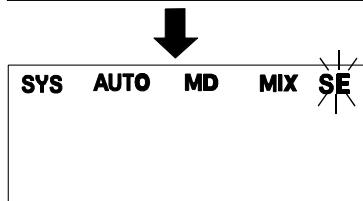
Setting example starts below




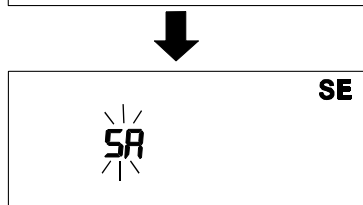
[1] Press the  Back key.



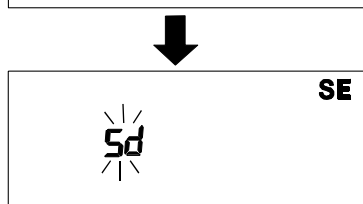
[2] Select "MIX" by using the  Up/Down key.




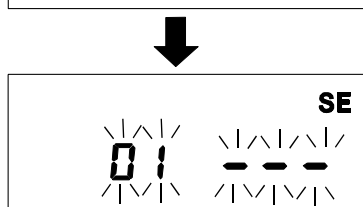
[3] After holding down the  Up key for about 3 seconds, "SE" will start flashing.



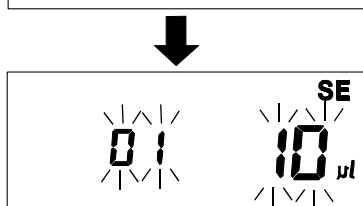
[4] After pressing the  Enter key, "SE" will fully light up and "SA" will start flashing.




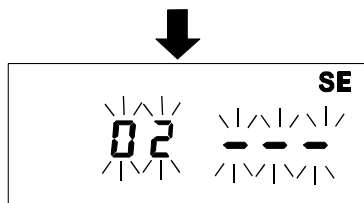
[5] "Sd" will be displayed flashing once selected with the  Up/Down key.




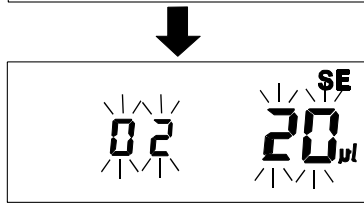
[6] Press the  Enter key once in "Sd" display.




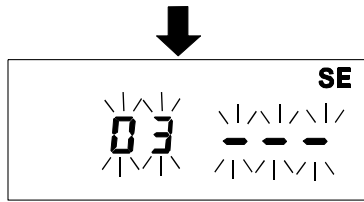
[7] Set the volume to be dispensed first (A) using the  Up/Down key. (In the example, 10 µL is set)




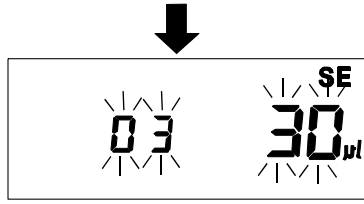
[8] The volume to be dispensed first (A) is determined by pressing the  Enter key.



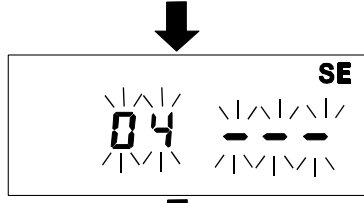
[9] Set the volume to be dispensed second (B) using the  Up/Down key. (In the example, 20 μ L is set)




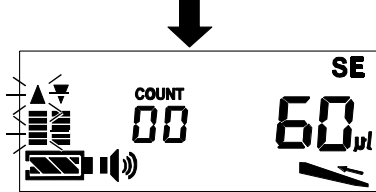
[10] The volume to be dispensed second (B) is determined by pressing the  Enter key.



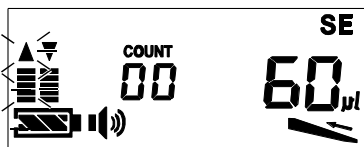
In a similar manner, set the further required dispensing volumes in the correct sequence.




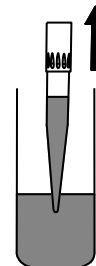
For example, when 3 volumes of liquid are to be dispensed, in order to not dispense a 4th time, when “04” is flashing, press the  Enter key when the set volume appears as “- - -”.

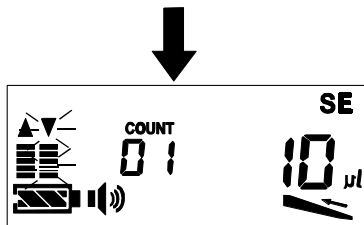



2) Operation method for Sequential Dispensing mode

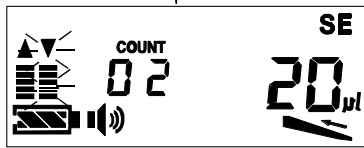
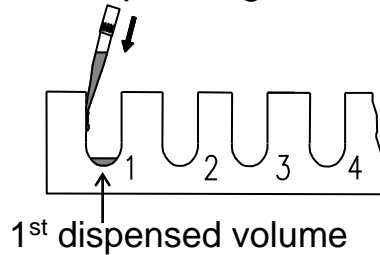



[1] Put the end of the tip in the liquid to be dispensed and press the  Operation key to aspirate the liquid.

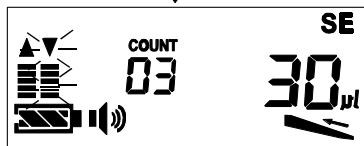





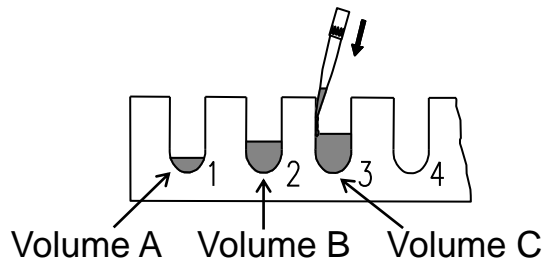
[2] Put the end of the tip into the vessel for receiving the dispensed liquid (1) and press the  Operation key to dispense the first dispensing volume (A).



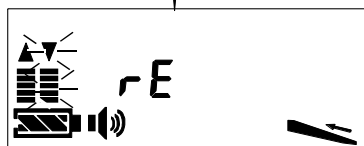
[3] Put the end of the tip into the next vessel (2) and press the  Operation key to dispense the second dispensing volume (B).




[4] Put the end of the tip into the next vessel (3) and press the  Operation key to dispense the third dispensing volume (C).



In a similar manner, dispense the further required dispensing volumes in the correct sequence.



[5] After the liquids have been dispensed, "rE" is displayed. The remaining liquid is discharged by pressing the  Operation key as in reverse mode.

