Warranty or Service

The pipette is guaranteed for a period of two years from the date of delivery against defects in materials and workmanship of the product. The warranty covers the costs of defective materials and labour. The warranty does not cover common wear and tear or customer misuse. CAPP recommends servicing pipettes on an annual basis to keep them in optimal working condition.

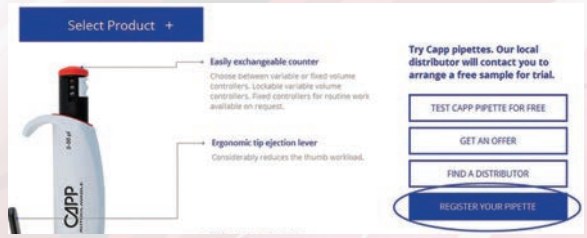
All warranty work and repair must be done by a CAPP authorized service center. To maintain the validity of the warranty, always have CAPP pipettes serviced by CAPP authorized service centers. The CAPP factory warranty is voided if repairs are performed by non-CAPP authorized service center. A complete list of CAPP authorized service centers can be found at www.cappahn.com.

Register Your CAPP Bravo Pipette

Your pipette has been engraved with a serial number (two letters and five digits) on the body of the pipette. Registering the pipette with CAPP will apply the warranty and create an ownership record for the instrument. Please refer to the serial number for all enquiries relating to the pipette.

How to register your pipette:

Go to www.cappahn.com and choose the pipette model you want to register. Click on "Register your Pipette"



Troubleshooting

Problem	Possible reason	Proposed action
Liquid is leaking from pipette tip	Pipette tip does not fit properly onto the pipette shaft	Use the appropriate size of CAPP Expell tip
	Liquid being pipetted is hot or cold. Liquid being pipetted is very dense or viscous	Shorten the amount of time the liquid is in the tip. Another possible solution is to use reverse mode pipetting
	Pipette shaft or sealing O-ring is worn	Replace shaft and/or sealing O-ring
	Tip is not loaded properly to maintain a seal	Press on tip more firmly (avoid using too much force and over inserting the tip)
Amount of sample delivered is not accurate	Pipette is not within calibration specifications	Send the pipette to an authorized CAPP service center for cleaning and maintenance
	Improper pipette technique	See suggestions for improving pipetting technique and results
Uneven movement of piston or plunger	Piston has corrosion or contamination	Send the pipette to an authorized CAPP service center for cleaning and maintenance
	Plunger rod has been damaged	Send the pipette to an authorized CAPP service center for cleaning and maintenance

CAPP®

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User Guide

CAPP Bravo

General operation

Volume Adjustments (variable volume pipettes)

1) Unlock the volume dial by pushing the lock lever upwards.

2) Choose the desired volume by turning the colored cap.

3) Re-lock by pushing the lock lever downwards.

Loading and Ejecting Tips

CAPP Expell tips are recommended for optimal use with the CAPP*Bravo* pipette.

Put the shaft into the tip and press firmly (Do not use excessive force which will cause an over insertion of the tip). Lightly tap the pipette tip back into the box while loaded on the pipette shaft to ensure the tip is properly seated and a good seal is formed. After dispensing the sample, eject the tip using the ejector button.

Five Step Pipetting Cycle

1) Press the plunger down to the first stop.

2) Place the tip in the liquid, release the plunger slowly to aspirate and hold the tip in the liquid for 1 second.

3) Place the tip in the sample vessel. Push plunger to the first stop to dispense.

4) Press the plunger to the second stop to blow out any remaining liquid.

5) Return the plunger back to the resting position.

Cleaning the Pipette

External cleaning is recommended using normal cleaning agents such as water with mild detergents, antiseptic agents or 60-70% ethanol. CAPP recommends that cleaning of internal components should be done by a trained professional in an authorized CAPP service center.

Autoclaving

The pipette is completely autoclavable. Autoclaving must not exceed 121°C for a period of 20 minutes.

Recommended Volume Ranges

To maintain the highest level of accuracy and precision, it is important to use the appropriate instrument relative to the desired sample volume. Piston stroke length and the size of the air pocket in the tip are the two factors that make air displacement pipettes inaccurate when used at inappropriate volumes.

Piston Stroke Length

Longer piston stroke lengths increase the accuracy and precision. A longer stroke length allows the error of inexact volumes to be dispersed over a larger volume range. Small errors are more impactful on a short stroke length than they are on a long stroke length. Piston stroke length is the reason that pipettes produce more accurate results on the high end of their volume range than they produce on the low end of their volume range.

Tip Air Pockets

It is necessary to have an air pocket in a pipette tip. However, having too large of an air pocket will affect the accuracy of the results.

Single Channel Pipette Specifications

Color Code	Size	Volume µL	Inaccuracy		Imprecision	
			Absolute ± µL	Relative ± %	≤ SD, µL	≤ % CV
Violet	0.1-2µL	0.2 1 2	0.024 0.031 0.040	12.00 3.10 2.00	0.012 0.016 0.020	6.00 1.60 1.00
White	0.5-10µL	1 5 10	0.025 0.060 0.100	2.50 1.20 1.00	0.018 0.04 0.050	1.80 0.80 0.50
Grey	2-20µL	2 10 20	0.10 0.12 0.20	5.00 1.20 1.00	0.03 0.06 0.06	1.50 0.60 0.30
Red	5-50µL	5 25 50	0.10 0.20 0.50	2.00 0.80 1.00	0.06 0.09 0.15	1.20 0.35 0.30
Orange	10-100µL	10 50 100	0.25 0.45 0.70	2.50 0.90 0.70	0.10 0.15 0.20	1.00 0.30 0.20
Yellow	20-200µL	20 100 200	0.50 0.80 1.20	2.50 0.80 0.60	0.14 0.30 0.40	0.70 0.30 0.20
Blue	100-1000µL	100 500 1000	2.00 4.00 8.00	2.00 0.80 0.80	0.60 0.75 2.00	0.60 0.15 0.20
Green	1-5mL	1000 2500 5000	12.00 20.00 30.00	1.20 0.80 0.60	3.00 5.00 7.50	0.30 0.20 0.15
Green	1-10mL	1000 5000 10000	30.00 40.00 60.00	3.00 0.80 0.60	6.00 10.00 15.00	0.60 0.20 0.15

Tested with distilled water at 19-22°C. Test procedures in accordance to ISO 8655. All pipettes are tested with ExpellPlus™ low retention tips, except 100-1000µL. 1-5mL and 1-10mL pipettes for which standard Expell tips are used.

Tips to improve the pipetting technique and results

Use the appropriate pipette tip size from a high quality manufacturer. CAPP*Bravo* pipettes are designed for optimal use with Capp Expell pipette tips.

Work in a controlled environment. Environmental factors that affect pipetting volumes include: changes in temperature, changes in air pressure, vibrations and movement within the solution being pipetted.

Pre-rinsing tips helps the polypropylene tip, which is naturally hydrophobic, to adjust to the aqueous solution being pipetted. CAPP recommends three pre-rinse cycles of aspiration and dispense for each sample pipetted.

To eliminate unwanted liquid on the outside of the tip, it is recommended to touch-off the outside of the tip to the side of the vessel containing the sample. Unwanted droplets hanging from the bottom of the tip can be eliminated by touching the droplet to the surface of the aqueous solution.

Use consistent plunger pressure and speed for each sample.

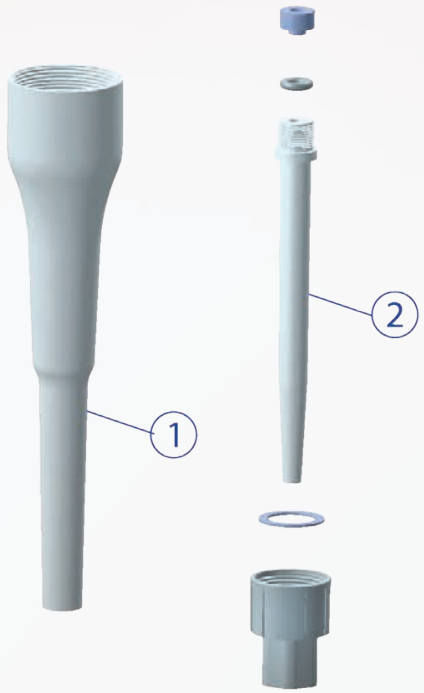
Proper tip immersion depth is important for aspirating an accurate sample. Immersing the tip too deep could cause extra liquid to be aspirated because of the additional force exerted by the aqueous sample. A shallow immersion depth could cause the tip to lose contact with the aqueous solution and aspirate too small a sample. The ideal tip immersion depth is between 2 to 5 mm during sample aspiration.

Immediately after aspirating the sample, pause for a second to allow the sample to fully equilibrate within the tip before removing the tip from the solution.

Try to keep the pipette as vertical as possible during use. Do not incline the pipette more than 15° while aspirating or dispensing.

After dispensing the sample, touch-off the tip onto the wall of the receiving vessel container to ensure complete delivery of the sample.

Minimize handling of the pipette and tip to avoid transferring of body heat. The transfer of heat affects the size of the air cavity in the tip and within the body of the pipette. It can affect the amount of sample aspirated and dispensed.



1. EJECTOR
2. TIP CONE
3. PISTON