

Procedure:

1. Do 10 pipettings with the minimum volume.
2. Do 10 pipettings with the maximum volume.
3. Calculate the accuracy (A) and precision(cv) of both series.
4. Compare the results to the limits in the Table 1.

If the results are in the limits of Table 1, then the calibration of the pipette is correct.

Otherwise the pipette must be adjusted and checked again.

Channel	Volume Range	Test Volume	Accuracy %	Precision %
8	0.5-10ul	10	1.50%	1.50%
		5	2.50%	2.50%
		1	4.00%	4.00%
8	5-50ul	50	1.00%	0.50%
		25	1.50%	1.00%
		5	3.00%	2.00%
8	50-300ul	300	0.70%	0.25%
		150	1.00%	0.50%
		50	1.50%	0.80%
12	0.5-10ul	10	1.50%	1.50%
		5	2.50%	2.50%
		1	4.00%	4.00%
12	5-50ul	50	1.00%	0.50%
		25	1.50%	1.00%
		5	3.00%	2.00%
12	50-300ul	300	0.70%	0.25%
		150	1.00%	0.50%
		50	1.50%	0.80%

ADJUSTMENT (Fig.7)

Adjustment is done with the service tool.

1. Place the service tool into the openings of the calibration nut at the top of the handle.
2. Turn the service tool clockwise to increase, or counterclockwise to decrease the volume.
3. After adjustment check the calibration according to the instructions above.

FORMULAS FOR CALCULATING RESULTS

Conversion of mass to volume

$$V = (w+e) \times Z$$

V = volume (ul)
 w = weight (mg)
 e = evaporation loss (mg)
 Z = conversion factor for mg/ul conversion

Evaporation loss can be significant with low volumes. To determine mass loss, dispense water to the weighing vessel, note the reading and start a stopwatch. See how much the reading decreases during 30seconds (e.g. 6 mg=0.2mg/s). Compare this to the pipetting time from taring to reading. Typically pipetting time might be 10 seconds and the mass loss is 2mg (10s x 0.2mg/s) in this example. If an evaporation trap or lid on the vessel is used the correction of evaporation is usually unnecessary. The factor Z is for converting the weight of the water to volume at test temperature and pressure. A typical value is 1.0032ul/mg at 22°C, and 95 kPa. See the conversion table on page 10.

Accuracy (systematic error)

Accuracy is the difference between the dispensed volume and the selected volume of a pipette.