

Annex B (informative)

Possible sources of error for piston pipettes with air interface

Table B.1 gives possible sources of error for piston pipettes with an air interface.

Table B.1 — Influencing parameters, resulting errors in measurement and corrective measures

Influencing parameter	Effect ^a	Influenceable by	Determinable by
Variations in air pressure at adjustment versus use of the pipette	up to 0,2 %	Constructive steps taken by manufacturer	Observing barometer at the measuring or working place
Difference in density of the liquid to be pipetted versus that of the water used for adjustment	up to 1,0 %	Observing user information	Comparing the density of the liquid to be pipetted to that of water
Difference in vapour pressure of the liquid to be pipetted versus that of the water used for adjustment	up to 2,0 %	Sufficient prewetting of pipette tip; observing ISO 8655-6	Dripping tip or drop hanging from the tip
Viscosity and/or flow characteristics and wetting characteristics of the liquid to be pipetted	^b	Observing user information	Visual check for droplets or liquid trails during delivery of liquid
Leaky piston/cylinder system	1 % to 50 %	Regular check of pipette and the volumes aspirated	Dripping tip, maximum permitted errors are exceeded
Uneven piston movement	up to 0,5 %	Smooth operation of piston; observing user information	Observing of one's own pipetting technique
Uneven rhythm and timing during pipetting	up to 1,5 %	Even pipetting technique; observing user information	Maximum permitted errors are exceeded
Depth of plunging of the pipette tip and handling angle during pipetting	up to 1,0 %	Holding pipette in vertical position, observing user information or ISO 8655-6	Visual control of plunging depth and handling angle
Variations in pipette temperature, ambient temperature and the temperature of the liquid to be pipetted	up to 0,3 %/K	To the extent possible, the temperature of the pipette, room and liquid to be pipetted should be the same	Measuring the temperature of air and medium; measuring of pipette temperature impossible
Changes in relative humidity of the ambient air	up to 3,0 %	Sufficient prewetting of pipette tip	Observing hygrometer
Failure to prewet pipette tip	up to 2,0 %	Prewetting of pipette tip	Maximum permitted errors are exceeded
Failure to wipe pipette tip on the vessel wall	up to 3,0 %	Wiping of the pipette tip on the vessel wall (wiping distance 8 mm to 10 mm), observing ISO 8655-6	Maximum permitted errors are exceeded
Leaky/poorly seated pipette tips	0,5 % to 50 %	Using original or recommended pipette tips	Dripping tip or maximum permitted errors are exceeded
Reuse of pipette tips	up to 4,0 %	Using pipette tips only once	Maximum permitted errors are exceeded
Straightness of pipette tips	up to 10 %	Using appropriate tips only	Visual check after positioning of the tips on the multi-channel pipette
^a Possible errors of measurement are estimates and are specified in percent of the nominal volume.			
^b Indication of possible error of measurement is not realistic as it depends on the liquid to be pipetted.			