

VARIABLE VOLUME 8/12 CHANNEL MICROPIPETETTE
OPERATION MANUAL

CE



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Please read the following carefully!

This instrument may sometimes be used with hazardous materials, operations, and equipment. It is beyond the scope of this manual to address all of the potential safety risks associated with its use in such applications. It is the responsibility of the user of this pipette to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1. Every user must read and understand this operating manual prior to using the instrument and observe these instructions during use.
2. Follow general instructions for hazard prevention and safety instructions; e.g., wear protective clothing, eye protection and gloves. When working with infectious or other hazardous samples, all appropriate regulations and precautions must be followed.
3. Observe the reagent manufacturers' information.
4. Only use the instrument for pipetting liquids that conform to the specifications defined in the limitations of use and operating limitations. Observe operating exclusions. If in doubt, contact the manufacturer or supplier.
5. Always use the instrument in such a way that neither the user nor any other person is endangered. Avoid splashes. Use only suitable vessels.
6. Avoid touching the tip orifices when working with hazardous samples.
7. Never use force on the instrument!
8. Use only original spare parts. Do not attempt to make any technical alterations. Do not dismantle the instrument any further than is described in the operating manual!
9. Before use check the instrument for visual damages. If there is a sign of a potential malfunction (e.g., piston difficult to move, leakage), immediately stop pipetting. Consult the 'troubleshooting' section of this manual and contact the manufacturer if needed.

Limitations Of Use

Purpose

The pipette is an air-displacement system for pipetting aqueous solutions with medium density and viscosity.

Limitations of use

The instrument is intended for the pipetting of liquids within the following limitations:

- temperature of both the instrument and solution should be between 15 °C to 40 °C (50 °F to 104 °F). Consult the manufacturer for use in temperatures outside of this range
- vapor pressure up to 500 mbar
- viscosity: 260 mPa s (260 cps)

Operating limitations

Viscous and highly adhesive liquids may impair volumetric accuracy. Volumetric accuracy may also be impaired when pipetting liquids that differ from ambient temperature by more than $\pm 1^{\circ}\text{C}$ / $\pm 1.8^{\circ}\text{F}$.

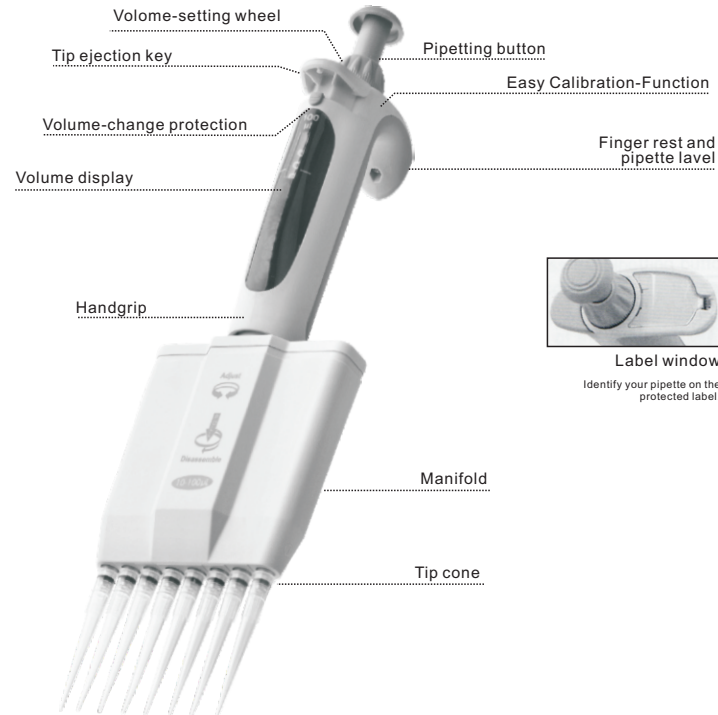
Operating Exclusions

The user has to ensure the compatibility of the instrument with the intended application.

This instrument cannot be used:

- for liquids incompatible with polypropylene and FKM
- for liquids attacking polycarbonate (viewing window)
- for liquids attacking polyphenyl sulfide (50 μl , 100 μl , 200 μl and 300 μl models)
- for liquids of a very high vapor pressure

Operating And Control Elements



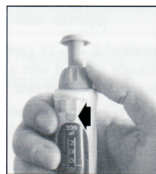
Note:

Optimum analysis results can only be obtained with quality tips. Please use the tips as the manufacturer recommend.

1. Fitting the tips

Use the correct tips according to the volume range or the color code. Ensure the tips are securely seated.

Pipette tips are disposables items!



2. Volume setting

- Push the volume-change protection upward to disengage (UNLOCK).
- Select the desired volume by rotating the volume-setting wheel. Avoid twisting and abrupt rotating motions during this adjustment.
- Push the volume-change protection down to re-engage (LOCK). Note: The volume-change protection tightens but does not lock volume-setting wheel.



3. Align the manifold

The manifold can turn freely in both directions.



4. Aspirate sample

- Press pipetting button to the first stop.
- Hold the pipette vertically and immerse the tips 2 to 3 mm into the liquid.
- Let the pipetting button slide back solely. In order for the liquid to reach its end position, leave the tips immersed for another 1-2 sec.
- Touch the tips against the container wall.



5. Discharge sample



- Place the pipette tips against the wall of the vessel. Hold the pipette at an angle of 30-45° relative to the container wall.
- Press the pipetting button slowly to the first stop and hold it down. For serum and liquids of high viscosity or low surface tension, observe adequate waiting time to improve accuracy.
- The blow-out stroke empties the tips completely: Press the pipetting button down to the second stop.
- While doing this, wipe the pipette tips against the wall of the container.
- Remove the pipette tips from the container wall and let the pipetting button slide back.



6. Ejecting the tips

Hold the manifold over suitable disposal container and press the tip ejection key to the stop.

Note:

ISO 8655 prescribes rinsing the pipette tips once with the sample liquid prior to the actual pipetting process.

Important!

Don't lay the instrument horizontal when the tips are filled. Liquid may enter and contaminate the instrument. The instrument should be stored without tips, placed upright in the supplied shelf/rack mount or bench top rack.

Depending on use we recommend inspection of the instrument every 3 to 12 months. The cycle can, however, be adjusted to individual requirements.

The gravimetric testing of the pipette volume is performed according to the following steps and is in accordance with DIN EN ISO 8655, Part 6.

1. Set nominal volume

Set volume to the maximum volume indicated on the instrument.

2. Condition the pipette

Condition the pipette before testing by using pipette tips to aspirate and discharge the test liquid (distilled H₂O) five times. After this, discard the pipette tips.

3. Carry out the test

- Attach new pipette tips and pre-rinse one time with test liquid.
- Aspirate liquid and pipette it into the weighing vessel.
Note: Each individual channel must be tested separately.
- Weigh the pipetted quantity with an analytical balance. (Please follow the operating manual instructions from the balance manufacturer.)
- Calculate the volume, taking the temperature into account.
- 3-10 pipettings and weighings per channel in three volume ranges (100%, 50%, 10% of nominal volume) are recommended for statistical analysis.

Calculation (for nominal volume)

x_i = Weighing results
 n = Number of weighings

$$\text{Mean value } \bar{x} = \frac{\sum x_i}{n}$$

Z = Correction factor
(e.g., 1.0029 μl / mg
at 20°C, 1013 hPa)

$$\text{Mean volume } \bar{V} = \bar{x} \cdot Z \quad (1)$$

Accuracy*

$$A\% = \frac{\bar{V} - V_0}{V_0} \cdot 100$$

V_0 = Nominal volume

Coefficient of Variation*

$$CV\% = \frac{100s}{\bar{V}}$$

Standard Deviation

$$S = Z \cdot \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$$

* = Calculation of accuracy (A%) and variation coefficient (CV%):
A% and CV% are calculated according to the formulas for statistical control.

Final test values related to the nominal capacity (maximum volume) or the indicated volume steps indicated on the instrument, obtained when instrument and distilled water are equilibrated at ambient temperature (20 °C/68°F) and with smooth operation According to DIN EN ISO 8655.

8/-12 channel

Volume range μl	Volume step μl	A* ≤ ±%	CV* ≤ %	Increment μl	Type of tips μl
0.5 - 5	10	1.6	1.0	0.1	20
	5	2	2		
	1	8	6		
5 - 50	50	0.8	0.4	0.1	200
	25	1.4	0.8		
	5	6	3		
10 - 100	100	0.8	0.3	0.2	200/300
	50	1.4	0.6		
	10	4	6		
20 - 200	200	0.8	0.3	0.2	200/300
	100	1.4	0.6		
	20	4	1.5		
30 - 300	300	0.6	0.3	0.2	300
	150	1.2	0.6		
	30	3	1.5		

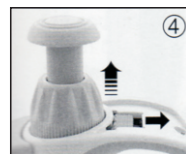
* A = Accuracy

* Cv = Coefficient of Variation

The instrument is permanently adjusted for aqueous solutions. If the pipette operation is clearly inaccurate, or if the instrument must be adjusted for solutions of different densities and viscosities or specially-shaped pipette tips, adjustments can be made using the Easy Calibration Technique.



1. Check the volume, determine actual value.



2. Remove the label window and the label, Push the hook forward, raise it slightly and then pull it back.



3. Using a paperclip or an unused pipette tip, remove the protective film (this protective film can be discarded).



4. Push the red adjustment slider completely back, raise the volume-setting wheel (decoupling) and release the adjustment slider.

5. Set the previously determined actual value (adjustment value) with the volume-setting wheel in the UNLOCK position.

6. Push the adjustment slider completely back again, push the volume-setting wheel downwards and release the adjustment slider. Re-insert the label and the label window.

Note :

The change to the factory settings is indicated by the red adjustment slider now visible in the label window.

Autoclaving

The 8/-12 channel is completely autoclavable at 121°C (250°F), 2 bar absolute (30 psi) with a holding time of at least 15 minutes according to DIN EN 285.

1. Eject the pipette tips.
2. Autoclave the complete pipette without any further disassembling.
3. Allow the 8/-12 channel to completely cool and dry.

Note:

The effectiveness of the autoclaving must be verified by the user.

Maximum reliability is obtained with vacuum sterilization. We recommend the use of sterilization bags.

Attention:

Prior to autoclaving, the volume adjustment must be set on an available numbered volume (e.g., 11.25 or 11.26 but not between), with the volume-change protection set fully unlocked.

If the pipette is autoclaved frequently, the pistons should be oiled with the supplied silicone oil in order to preserve smooth movement.

If necessary after autoclaving, tighten the connection between the hand grip and the manifold.



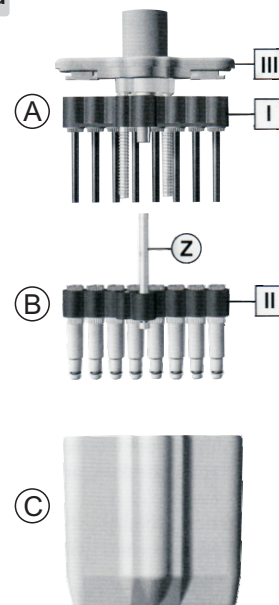
Servicing And Cleaning

The three main components of the manifold can be easily separated and disassembled for servicing, cleaning or replacing parts. The procedures are illustrated on the following pages.

Note: The changing of the V-rings/O-rings on the individual nose cones is described in detail in the instructions enclosed with the spare part.

The main components of the manifold

- A** Piston unit with piston support bar [I] and pistons inserted in this unit, which can be unscrewed individually for cleaning or replacement.
- B** Nose cone assembly with nose cone support bar [II] and central guide rod [Z], which is attached to this, and the nose cones and seals, which can be unscrewed individually for cleaning or replacement.
- C** Manifold housing, which is connected to the manifold housing cover [III] of the piston unit with two turn-lock fasteners.



Servicing

In order to assure proper functioning, the 8/-12 channel pipette should be serviced and cleaned at regular intervals.

What is to be inspected?

1. Inspect nose cones ,pistons and seals for damage and contamination.
2. Test the sealing of the instrument.TO do this aspirate a sample,and then hold the instrument in a vertical position for about 10 sec.If a drop forms at the tip orifices, see the troubleshooting guide.

Cleaning instructions

1. Clean single nose cones,pistons and nose cone support bar/piston support bar(**these components only**)with soap solution or isopropyl alcohol.Afterwards,rinse with distilled water.
2. Let these parts dry and cool down completely. Residual moisture in the nose cones may result in a loss of accuracy
3. Lubricate the piston with a very thin coating of the silicone oil supplied.For the central guide rod(Z)only use the recommended fluorstatic grease!

Disconnecting handle from manifold

1. Eject the pipette tips.
2. To disconnect the manifold,pull it downward as far as possible,and only then turn it clockwise. After one rotation, it should no longer be pulled downward while it is being turned.

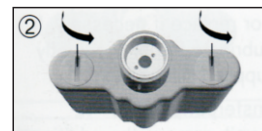
Attention:

Improper handling can damage the unit!

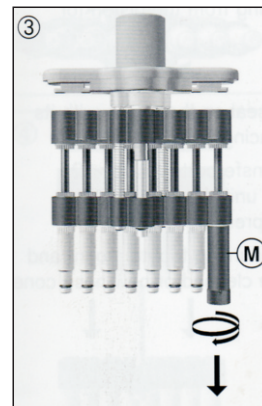


Removing of nose cones and seals

for cleaning or replacing

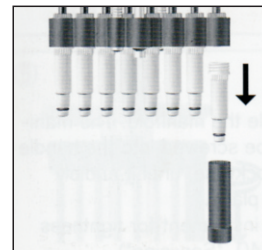


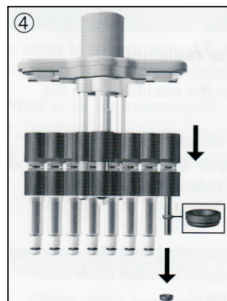
1. Disconnect the manifold from the handle.



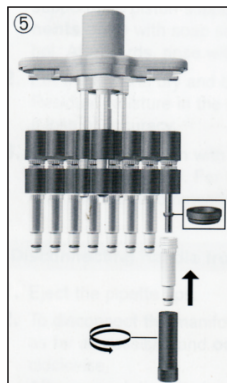
2. Turn both closures of the manifold housing cover 90°(e.g.,using a coin)and slide off the housing.

3. Push the mounting tool(M)(supplied with the pipette)on the nose cone and unscrew it.

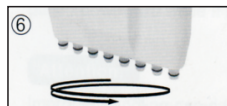




4. Push the piston unit down to the bottom. The seal will either remain inside the nose cone or will stay on the piston after the nose cone is removed. Remove the seal, inspect it and clean or replace if necessary. If required, lubricate the piston lightly with the supplied silicone oil. (In the 8/-12 channel pipette 30-300 ul unit, remove the additional pressure ring from the piston for cleaning.)

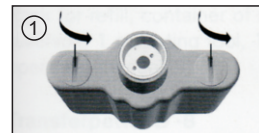


5. Push the seal on the piston with its flat side facing upward. (In the 8/-12 channel pipette 30-300 ul unit, first replace the additional pressure ring!) Use the mounting tool to mount and tighten the cleaned or new nose cone



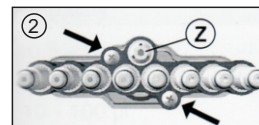
6. Reassemble the manifold. The manifold must be screwed into the handle counter-clockwise, until it audibly snaps into place. Check the instrument for tightness.

Removing of pistons



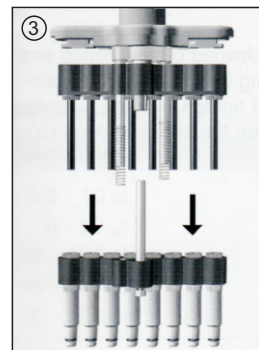
for cleaning or replacing

1. Disconnect the manifold from the handle.
2. Turn both closures of the manifold housing cover 90° (e.g., using a coin) and slide off the housing.
3. Remove both outer Phillips screws on the nose cone assembly.

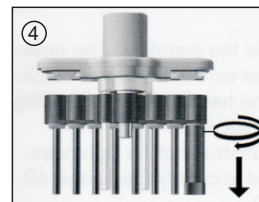


Attention:

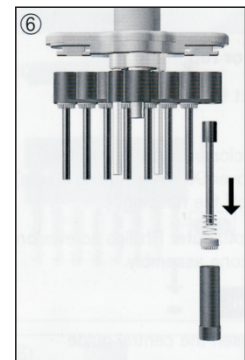
Do not loosen the central guide rod (Z)!



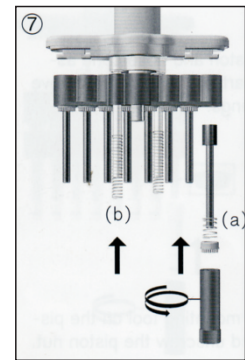
4. Pull the piston and nose cone assembly apart and separate. Remove stroke springs.



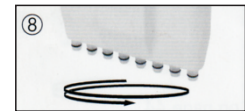
5. Place the mounting tool on the piston nut and unscrew the piston nut.



6. Remove the piston nut with piston spring and pull out the piston.



7. Insert the cleaned or new piston and piston spring(a). Screw on the piston nut and tighten with the mounting tool. Replace the stroke springs(b).



8. Reassemble the manifold. The manifold must be screwed counter-clockwise into the handle so that it audibly snaps into place. Check the instrument for tightness, mobility and accuracy.

Items supplied

Confirm that your package includes: 8 or 12 channel pipette, 1 Tip-Box N filled with pipette tips, 1 Tip-Rack for refill, 1 mounting tool, 1 set of sealing rings made of FKM and this operating manual.

8 channel

Capacity	Description
0.5-10 μ	8-10
5-50 μ	8-50
10-100 μ	8-100
20-200 μ	8-200
30-300 μ	8-300

12 channel

Capacity	Description
0.5-10 μ	12-10
5-50 μ	12-50
10-100 μ	12-100
20-200 μ	12-200
30-300 μ	12-300

Bench-top rack for 6 single channel pipette or 3 8/-12 channel pipettes

Cat.No. 7048 05

Bench-top rack for 1 8/-12 channel pipettes

shelf/rack mount for 1 single channel pipettes or 1 8/-12 channel pipette



Additional accessories for 8/-12 channel pipettes

Description

Label window, pack of 1

Blank labels, pack of 5

Silicone oil

Fluorstatic grease

Reagent reservoir, PP.

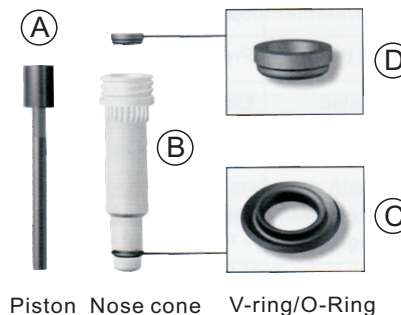
Capacity 60 ml. Autoclavable (121°C)

non-sterile, with lid. Pack of 10.

sterile, without lid, packed individually. Pack of 100.

sterile, without lid, 5 per bag. Pack of 200.

Parts will differ slightly depending on nominal volume of instrument.
(Fig. shows spare parts for 8/-12 channel pipette, 10-100 µl).



*incl. seal, V-ring and mounting tool.
Transferpette® S-8/-12 30-300 µl with additional pressure ring.

Problem	Possible cause	Corrective action
Tip dripping (instrument leaks)	Unsuitable tip	Only use high-quality tips
The instrument does not aspirate or aspirates too little; the discharged volume is too low.	Tip not seated tightly	Press tip on firmly
	Seal contaminated	Clean seal
	The seal or cone is damaged	Replace seal or shaft
Aspiration is too slow	The piston is contaminated or damaged	Clean or replace piston
	Shaft clogged	Clean shaft
Discharged volume is too large	Pipetting button pressed too far into the blow-out position before sample uptake	Operate properly. See 'Pipetting'.
Piston is difficult to move	The piston is contaminated or needs oil	Clean and oil the piston

If a problem cannot be fixed by following the troubleshooting guide, or by replacing spare parts, then the instrument must be sent in for repair.

For safety reasons, instruments returned for checks and repairs must be clean and decontaminated!

Return for repair

- Clean and decontaminate the instrument carefully.
- Complete the "Declaration on Absence of Health Hazards" (ask your supplier or manufacturer for forms).
- Send the completed form along with the instrument to the manufacturer or to the dealer with an exact description of the type of malfunction and the media used.

The return transport of the instrument is at risk and cost of the sender.

Calibration Service

ISO and GLP guidelines require regular examinations of your volumetric instruments. We recommend checking the volume every 3-12 months. The interval depends on the specific requirements on the instruments. For instruments frequently used or in use with aggressive media, the interval should be shorter. The detailed testing instruction can be downloaded on manufacturer's website. Just send in the instruments to be calibrated, accompanied by an indication of which kind of calibration you wish. Your instruments will be returned within a few days together with a test report.

Warranty Information

We shall not be liable for the consequences of improper handling, use, servicing, operating or unauthorized repairs of the instrument or the consequences of normal wear and tear especially of wearing parts such as pistons, seals, valves and the breakage of glass as well as the failure to follow the instructions of the operating manual. We are not liable for damage resulting from any actions not described in the operating manual or if non-original parts have been used.

Disposal

For the disposal of instruments and tips, please observe the relevant national disposal regulations.

Subject to technical modification without notice.
We will not be held responsible for printing or typographical errors.