

Mikro-Dispenser, fix
Micro dispenser, fix

piccolo 1

Mikro-Dispenser, umschaltbar
Micro dispenser, dual volume

piccolo 2

Gebrauchsanweisung
Operating Manual

Vor dem ersten Gebrauch das Gerät gründlich spülen
oder die ersten Dosierungen verwerfen.

Before using the instrument for the first time, ensure
it is rinsed carefully or discard the first few samples
dispensed.



Contents

1. Safety Instructions	22
2. Application and Operating Limitations	23
3. Operating Exclusions	23
4. Operating Limitations	24
5. Storage Conditions	24
6. Components	25
7. Dispensing	26
7.1. Preparation for dispensing	26
7.2. Priming	26
7.3. Adjusting the volume	27
7.4. Dispensing	27
8. Cleaning	28
8.1. Emptying	28
8.2. Standard cleaning	28
8.3. Intensive cleaning	29
9. Cleaning/replacing the valves	30
9.1. Intake valve	30
9.2. Discharge valve	31
10. Calibration	32
11. Troubleshooting	34
12. Technical Data Ordering Information	34
12.1. Items supplied	34
12.2. Safety symbols	35
12.3. Accessories and Spare Parts	35
13. Repair service	37
14. Warranty	38
15. Disposal	38

1. Safety Instructions

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 instrument 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 before operation.
2. Follow general instructions for hazard prevention and safety instructions; e.g., wear protective clothing, eye protection and gloves.
3. Observe all specifications provided by reagent manufacturers.
4. Use the instrument only for dispensing liquids, with strict regard to the defined limitations of use and operating limitations. Observe operating exclusions (see chapter 3)! If in doubt, contact the manufacturer or supplier.
5. Never use force on the instrument.
6. Always use the instrument in such a way that neither the user nor any other person is endangered. When dispensing, the discharge tube must always point away from you or any other person. Avoid splashes. Only use suitable vessels.
7. Clean the instrument before disassembling.
8. Use only original manufacturer's accessories and 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. Always check the instrument for visible damage before use. If there is a sign of a potential malfunction (e.g., piston difficult to move, sticking valves or leakage), immediately stop dispensing. Consult the 'Troubleshooting' section of this manual (see chapter 11), and contact the manufacturer if needed.

2. Application and Operating Limitations

This instrument is designed for dispensing of aqueous and highly diluted agents, observing the following physical limits:

- use temperature from +15 °C to +40 °C of instrument and reagent
- density up to 2.2 g/cm³
- vapor pressure up to 500 mbar
- viscosity up to 200 mm²/s

3. Operating Exclusions

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

When the instrument is correctly used, the dispensed liquid comes into contact with only the following materials:

Borosilicate glass, FEP, ETFE, PFA, PTFE and Platinum-Iridium.

Never use Dispenser with:

- Concentrated acids and alkalis
- Liquids which attack FEP, ETFE, PFA and PTF; e.g., dissolved sodium azide
- Liquids attacking borosilicate glass (e.g., hydrofluoric acid)
- Suspensions (e.g., of charcoal) as solid particles may clog or damage the instrument
- Solutions which decompose and form solid particles (e.g., Biuret reagent);
- Substances which undergo catalytic transformation or react with Platinum-Iridium (e.g., H₂O₂);
- Explosive liquids (e.g., carbon disulfide)
- Tetrahydrofuran
- Trifluoroacetic acid

4. Operating Limitations

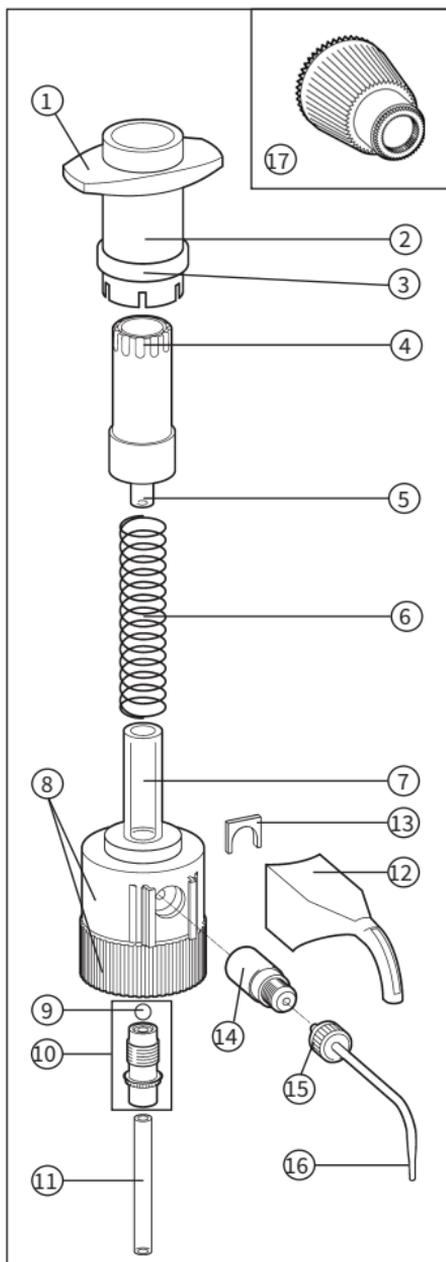
Liquids, which form deposits may make the piston difficult to move or may cause jamming (e.g., crystallizing solutions or concentrated alkaline solutions). If the piston movement becomes sluggish or stiff, the instrument should be cleaned immediately (chapter 8).

When dispensing inflammable media, make sure to avoid to buildup of static charge, e.g., do not dispense into plastic vessels; do not wipe instruments with a dry cloth.

The instrument is designed for general laboratory applications and complies with the relevant standards, e.g. DIN EN ISO 8655. Compatibility of the instrument for a specific application (e.g., trace material analysis, food sector etc.) must be checked by the user. Approvals for specific applications, e.g. for production and administration of food, pharmaceuticals or cosmetics are not available.

5. Storage Conditions

Store the instrument and accessories only in cleaned condition in a cool and dry place. Storage temperature: from -20 °C to +50 °C (from -4 °F to 122 °F).



6. Components

1. Handle
2. Outer sleeve
3. Securing ring
4. Operating knob
5. Piston
6. Lifting spring
7. Glass cylinder
8. Valve head (GL 28)
9. Valve ball
10. Intake valve
11. Intake tube
12. Discharge tube support
13. Securing clip
14. Discharge valve
15. Discharge tube securing nut
16. Discharge tube
17. Valve tool

7. Dispensing

7.1. Preparation for dispensing

1. Observe Operating Limitations and general safety regulations.
2. Push the intake tube into the intake valve as far as possible and cut the lower end at an angle.
3. Screw the dispenser on to the reagent bottle and align it with the bottle label.

Warning!

Avoid splashing of reagent!

4. Place a suitable vessel below the discharge tube.
5. The discharge tube must point away from the user at all times.

7.2. Priming

1. Place a suitable vessel below the discharge tube.

Warning!

Reagent may splash!

2. Gently push down the piston several times until air bubbles have disappeared from the discharge tube.

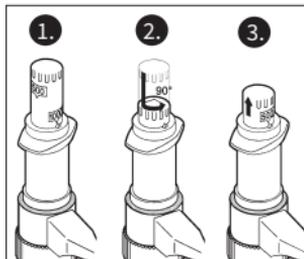
7.3.Adjusting the volume

(only piccolo 2)

Warning!

Reagent will dispense while volume is being adjusted. Hold a suitable vessel below the discharge tube outlet.

To set the volume, push down the operating knob and twist handle 90°. The nose of the housing indicates the volume after releasing operating knob.



7.4.Dispensing

1. Place a suitable vessel below the discharge tube.
2. Slowly steadily depress piston, release gently. No air bubbles should be visible during dispensing.

Warning!

If the piston moves stiffly or is difficult to move, stop dispensing immediately and clean the instrument (see chap. 8).

Attention!

Reagent may escape from the discharge tube.

8. Cleaning

Instrument will only function safely if cleaned regularly. Be sure to clean the instrument:

1. Immediately, if the piston moves stiffly;
2. Before changing reagents
3. Before longer breaks in use
4. Before any maintenance and repair work

Warning!

Dispenser, intake tube and discharge tube may be filled with reagent. To prevent injury from chemicals, always wear eye protection, protective clothing and protective gloves. Always point the discharge tube outlet away from the user or other people.

8.1. Emptying

1. While the dispenser is still mounted on the bottle, place into a suitable basin.
2. Unscrew the dispenser and lift it high enough so that the intake tube is no longer immersed in liquid.
3. Cautiously tap the intake tube against the inside of the bottle so that any remaining reagent runs out.
4. Remove the dispenser from the bottle and mount it on another empty bottle.
5. Hold the discharge tube outlet over the opening of the first bottle. Empty the discharge tube by repeated dispensing movements.

8.2. Standard cleaning

1. Mount the empty dispenser on a bottle filled with a suitable cleaning solution.

Warning!

Reagent may splash!

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2. Rinse the dispenser by repeated dispensing movements. Place a suitable vessel below the discharge tube.
 3. Completely empty the instrument by repeated dispensing movements, as described in chapter 8.1.
 4. Mount the dispenser on a bottle filled with distilled water and rinse it by repeated dispensing movements. Then empty the instrument as described in chapter 8.1.

8.3.Intensive cleaning

Intensive cleaning must be preceded by a standard cleaning. This procedure must be followed if the piston is difficult to move. For this purpose, the dispenser must be partially disassembled.

Warning!

Before disassembling, always perform the standard cleaning procedure. To prevent injury from chemicals, always wear eye protection, protective clothing and protective gloves. Avoid splashing of reagent.

1. Pull off the intake tube (11) and clean it with a soft bottle brush. Replace if necessary, especially if cracked or worn.
2. Use a small screw driver to gently pry between the securing ring slot (3) and valve head (8) and carefully push up the securing ring (3).
3. Disassemble outer sleeve (2) by pressing down operating knob (4) and pulling the securing ring (3) simultaneously.
4. Remove the operating knob (4) with the piston (5) and the “Lifting spring”.
5. Clean the piston and the cylinder with a soft bottle brush and rinse with water.

Attention!

Insert the piston at a slight angle to avoid damage to the lip seal.

6. Mount the lifting spring (6) and carefully reinsert the piston (5).
7. Replace the outer sleeve (2) and press it down until it audibly locks in place.
8. Push down the securing ring (3).

9. Cleaning/replacing the valves

9.1. Cleaning/replacing the intake valve

Note:

Valve ball (9) may fall out when valve is removed

1. Unscrew the intake valve (10) using the valve tool (17).
2. Clean or replace the valve.
3. Make sure that valve ball is still in place. To reassemble, handtighten valve (10) and complete using valve tool (17).

9.2. Cleaning/replacing the discharge valve

1. Remove the discharge tube support (12).
Pull out securing clip (13) with a small screwdriver.
2. Pull out the discharge valve (14).
3. Unscrew the discharge tube securing nut (15) and pull out the discharge tube (16).
4. Clean or replace the valve.
5. To reassemble push in valve (14) by hand and insert securing clip (13).
6. Push in the discharge tube as far as possible and tighten the securing nut (15).
7. In reverse order mount the discharge tube support (12).

Warning!

Never use force during disassembly and assembly. Verify that all components fit tightly and securely. Subsequent to reassembly, gravimetrically check volume (see chapter 10).

10. Calibration

Depending on use, we recommend that gravimetric testing of the instrument be carried out every 3-12 months. This time frame should be adjusted to correspond with individual requirements. The complete testing procedure (SOP) can be downloaded at www.vitlab.com. In addition, you can also perform a function test at shorter intervals, e.g. dispensing the nominal volume into a volumetric test flask.

Gravimetric volume testing according to DIN EN ISO 8655-6 (for measurement conditions, see 'Error Limits', chapter 12) is performed as follows:

1. Preparation of the instrument

Clean the instrument ('Cleaning', chapter 8), fill it with distilled H₂O and then prime it carefully.

2. Check the volume

- a) 10 dispensing operations with distilled H₂O in 3 Volume ranges (100 %, 50 %, 10 %) are recommended.
- b) For filling pull up the piston gently until the upper stop of the volume set.
- c) For discharge depress piston slowly and steadily without force until the lower stop.
- d) Wipe off the tip of discharge tube.
- e) Weigh the dispensed quantity on an analytical balance. (Please follow the operating manual of the balance manufacturer.)
- f) Calculate the dispensed volume. The Z factor takes account of the temperature and air buoyancy.

Calculations for nominal volume V_N

x_i = results of weighings

n = number of weighings

Z = correction factor

(e. g., 1.0029 $\mu\text{l}/\text{mg}$ at 20 °C, 1013 hPa)

Mean value

$$\bar{x} = \frac{\sum x_i}{n}$$

Accuracy

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

Mean volume

$$\bar{V} = \bar{x} \cdot Z$$

Coefficient of variation

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

Standard deviation

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

11. Troubleshooting

Trouble	Possible causes	Action to be taken
Piston is difficult to move	Formation of crystals	Clean instrument (see chapter 8)
Reagent is not aspirated	Sticking filling valve	Clean intake valve; replace if necessary (see chapter 9.1)
Cylinder does not fill	Discharge valve damaged	Clean discharge valve; replace if necessary (see chapter 9.2)
Intake-/discharge tube not firmly connected	Tubes damaged	Replace intake-/discharge tube
Air is aspirated	Intake valve not firmly connected Intake tube not firmly connected or damaged Reagent with high vapor pressure has been drawn in too quickly	Tighten intake valve; replace if necessary (see chapter 9.1) Push intake tube on firmly; replace if necessary Aspirate reagent more slowly
Dispensed volume is too low	Intake valve leaks Intake tube not firmly connected or damaged	Clean intake valve; replace if necessary (see chapter 9.1) Push intake tube on firmly; replace if necessary

If these measures do not help, return instrument for repair (see chap. 13).

12. Technical data | Ordering information

12.1 Items supplied

VITLAB® piccolo 1 or VITLAB® piccolo 2 complete with discharge tube, intake tube and tool.

VITLAB® piccolo 1

(micro dispenser, fix), GL 28

Volume	Systematic error* A%	Random error* CV%	Cat. No.
100 µl	≤± 3,0	≤ 0,4	1610501
200 µl	≤± 2,0	≤ 0,4	1610502
250 µl	≤± 2,0	≤ 0,4	1610503
500 µl	≤± 1,5	≤ 0,3	1610504
1000 µl	≤± 1,0	≤ 0,2	1610506

* Values based on nominal volume.

VITLAB® piccolo 2

(micro dispenser, dual volume), GL 28

Volume	Systematic error* A%	Random error* CV%	Cat. No.
100/250 µl	≤± 2,0	≤ 0,4	1611503
500/1000 µl	≤± 1,0	≤ 0,2	1611506
1000/2000 µl	≤± 1,0	≤ 0,2	1611508

* Values based on nominal volume.

Calibration conditions:

Distilled water delivered at, 20 ± 0.5 °C

Number of testing procedures:

10 according to DIN EN ISO 8655

(Technical specifications subject to change!)

12.2 Safety symbols

Symbol on Device	
	General warning sign
	Observe the operating manual
	Use eye protection
	Use hand protection
	Use protective clothing

12.3 Accessories and Spare Parts for VITLAB® piccolo 1 + 2

Intake tube length 150 mm	1650010
Intake tube length 180 mm	1650011
Intake valve complete with ball (ETFE/Borosilicate glass)	1655011
Discharge tube	1650145
Discharge valve (PFA/Borosilicate glass/ Platinum-Iridium)	1655090
Threaded bottles, 100 ml, coated, GL28	1671505

13. Repair Service

Attention!

Transporting of hazardous materials without a permit is a violation of federal law.

- Clean and decontaminate the instrument carefully.
- It is essential always to include an exact description of the type of malfunction and the media used. If information regarding media used is missing, the instrument cannot be repaired.
- Shipment is at the risk and the cost of the sender.
- Complete the “Declaration on Absence of Health Hazards” and send the instrument to the manufacturer or supplier. Ask your supplier or manufacturer for the form. The form can also be downloaded from www.vitlab.com.

14. Warranty

We shall not be liable for the consequences of improper handling, use, servicing, operation 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 spare parts or components have been used.

15. Disposal



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

Subject to technical modification without notice. Errors excepted.

