Liquid Handling

Labnet

LABmax

Bottle-Top Dispenser

Operating Manual

Please study carefully and follow step by step!

Content

1 Safety- and user precautions

1.1 General safety precautions

In order to put the device into operation as quickly as possible and free from defects, it is necessary that you read this manual carefully before using this device.

Highest safety precautions should be used when dispensing corrosive, poisonous, radioactive or hazardous chemicals.

- Observe the general safety regulations for handling chemicals (e.g. protective clothing, protective goggles).
- Use the dispenser only with regard to the chemical resistance of materials and for the purpose for which is intended.
- Always check the device for leak tightness and a firm position of the plug and socket connection before you use it.
- Never use force. Breakage of any part will lead to hazardous exposure for the user as well as for other persons.
- Clean the device every day.
- The temperature of the dispenser and reagent should not exceed 40°C (104 °F).
- The user is responsible for checking that the device is suitable for his application.
- The proper and secure function is only guaranteed by using the supplied discharge tube (see page 7, component no. 6). Do not use any other discharge tube.
- Never use damaged or deformed tubes. If the valve is damaged, the discharge tube might drop.
- The discharge tube should never face the user and a collection vessel should be placed underneath.
- Check all screw fittings approximately one hour after each assembling or disassembling for tightness. Temperature variations might lead to material expansions and therefore to leakages.
- If you are unsure about dispensing a specific chemical solution, please contact your distributor.

1.2 To be considered before initial operation

- Check device for damages in transit.
- Shorten suction tube (see page 7, 18) to proper length. It should reach the bottom of the bottle.
- Do not use the outer housing (2) for carrying the assembled dispenser.
- Attach discharge tube (7) and clip on protective sleeve (6) carefully to avoid damage.
- When screwing on/off the bottle do not hold the device at its outer housing (2), but at the screw base.
- Do not pump before the device has been assembled completely and a collecting vessel has been placed underneath.

1.3 Operating limitations

Use for:	■ nearly all liquids
Don´t use for:	■ PTFE swelling solvents ■ Hydrofluoric acid ■ Chemical solutions which react with platinum-iridium alloys

1.4 Parts in contact with reagent

The components having direct contact with the reagent are made of chemical resistant materials:
platinum spring, ceramic valve balls, PTFE piston, borosilicate glass 3.3 cylinder

2 General product description

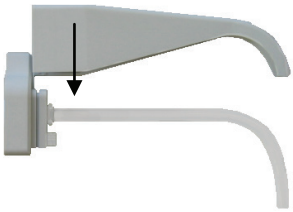
Labmax is our sophisticated dispensing system which fulfills increasing requirements in laboratories. It consists of high precision components and extreme robust materials “made in Germany”.

Labmax is an exclusive instrument with 0% loss of reagent due to air-purging and draining within a closed circuit. The valve block is 360° rotatable; therefore the label of the bottle is always visible for your added safety. Labmax has our unique 100 % drip free system for your safety at work: just turn the discharge tube at 180 ° to drain it and avoid further uncontrolled flow of liquid!

Labmax is fully autoclavable at 121 °C and can be completely disassembled for cleaning. Each device is single tested and delivered with conformity certificate.

3 Commissioning

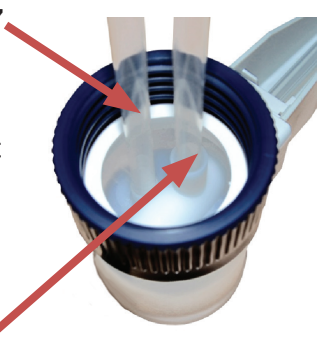
First attach the discharge tube (7) to the valve block (16) and then clip on the protective sleeve (6). Make sure it fits tightly!



Attachment of suction tube

Shorten suction tube to desired length and put it into the smaller (17) socket of the bottom part of the instrument. Check for the proper length of the suction tube (it should reach the bottom of the bottle).

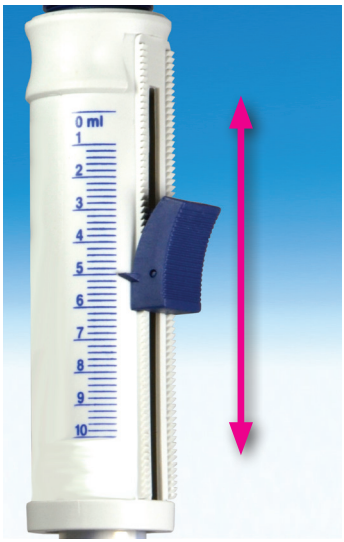
The return tube is already attached to the bigger socket (18).



4 Functional characteristics

4.1 Volume adjustment

The quick-volume-adjustment is performed with the quick lock knob (3). Push the quick lock knob, slide it down to the desired volume and release.

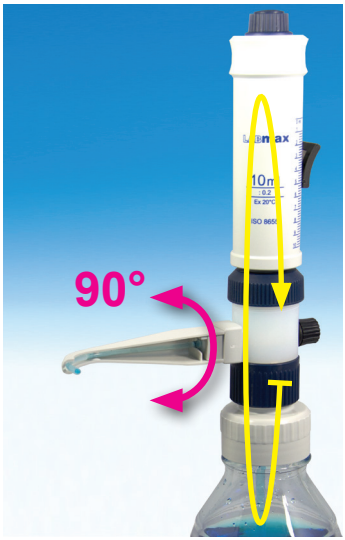


4.2 Air-purging

Turn the discharge tube to 90°. Set a small volume according to 4.1 and dispense until the cylinder is free from air. Air-purging is made in a closed circuit for zero loss of reagent.

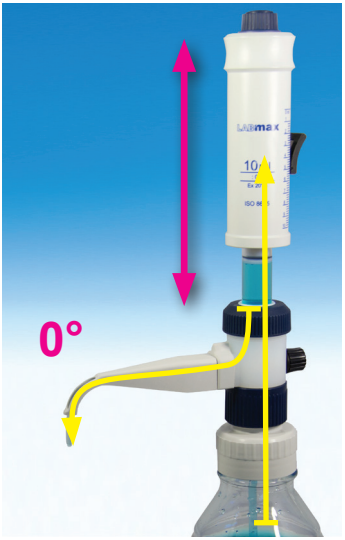
Turn the discharge tube back to 0° position and fill it with liquid to guarantee a correct dispensing volume (zero point). Then fill the cylinder up to the selected volume.

Your dispenser is now ready to use.



4.3 Dispensing

To avoid personal injury from chemicals, wear eye protection and use appropriate safety equipment and clothing. Please follow all safety instructions as well as the operating procedures in this manual.
Raise the outer housing (2) until it stops itself in according to the set volume. The set volume will be dispensed into the collecting vessel by pressing down the outer housing to the lowest point. The movements should be smooth and constant to achieve an exact ejection volume.



4.4 Anti-drip system

Turn the discharge tube at 180°. The liquid from the discharge tube will now rinse back into the bottle. Any further dispensing of liquid is not possible in this position.

Turn the discharge tube at 90° in order to seal the dispenser.

In addition you can use optional accessories to ensure protection against humidity, dust or bacteria or to avoid emitting of gases and strong smell (see p. 24).

5 Cleaning and maintenance

5.1 Description of the components

[1] Fix screw

[3] Quick lock knob

[2] Outer housing

[4] Adaptor ring

[5] Cap nut

[6] Protective sleeve

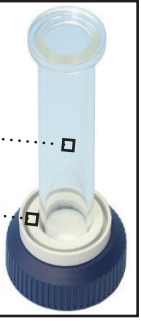
[7] Discharge tube

[13] Cylinder set:

[15] Cylinder

[4] Adaptor ring

[5] Cap nut

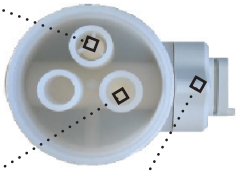


[8] Suction valve

[9] Valve star

[10] Valve ball

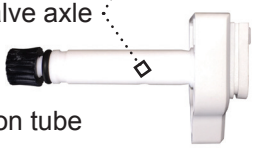
IMPORTANT: Edges on top!



[11] Ejection valve

[16] Valve block

[12] Valve axle



[17] Suction tube

[18] Return tube

[14] Piston

5.2 Cleaning

Cleaning is necessary if you want to use the dispenser for another chemical solution or if you don't use it for a longer time. During cleaning, please follow the safety instructions!

Before cleaning, remove all liquid from the dispenser without any loss of reagent following these steps:

1. Turn the discharge tube (7) to 180° and let the remaining reagent from the discharge tube flow back into the reagent bottle.
2. Screw off the dispenser from the bottle.
3. Drain the suction tube (17) by slightly tapping inside the reagent bottle.
4. Turn the discharge tube from 180° to 90° and remove all remaining liquid from the cylinder back into the reagent bottle.

For cleaning, follow these steps:

1. Attach suction tube and screw the dispenser on a bottle with distilled water or alcohol.
2. Turn discharge tube to "Dispense" mode.
3. Dispense multiple times until the device is cleaned.

If necessary, disassemble the dispenser (see 5.4 and 5.5) and clean all components.

The dispenser should be rinsed daily if used with following chemicals:

- Solutions with tend to build crystals (e.g. salts)
- Inorganic oxidizing solutions (e.g. biuret reagent)

5.3 Sterilization

After removal of return tube (18) and suction tube (17) the dispenser can be steam-sterilized (121 °C, 2 bar, 20 minutes) according to DIN EN 285.

Place the device on a cloth and avoid any contacts with hot metal surfaces.

In order to prevent loss of adjustment due to heat expansion of the different materials, the quick lock knob (3) has to be set to minimum 2/10 of its maximum volume.

After sterilization, let the device cool down to room temperature before you use it again. Also check all parts for deformations or other changes. After approximately one hour, check all screw fittings once again for tightness.

Do not use any deformed or leaking parts.

It is also possible to perform a chemical sterilization with alcohol, formaldehyde etc.

In case of deformation, please return the device including the autoclave protocols.

5.4 Disassembly

1. Follow the safety instructions!
2. Rinse the dispenser with distilled water or alcohol (see 5.2).
3. Remove the suction tube (17) and the return tube (18).
4. Remove the protective sleeve (6) and then the discharge tube (7).
5. Loosen the fix screw (1) and pull out the piston (14).
6. Pull off the adapter ring (4) from outer housing (2).
7. Press down the quick lock knob (3) and pull it out of the slot.
8. Remove the outer housing (2).
9. Loosen the cap nut (5).
10. Pull the cylinder set (13) out of the valve block (16), keep in mind that the valve star (9) and the valve ball (10) might fall out.
11. Take the valve star (9) and the valve ball (10) out of the valve block (16).
12. Pull the valve axle (12) out of the valve block (16).

5.5 Assembly

1. Push the valve axle (12) into the valve block (16).
2. Place the valve ball (10) and the valve star (9) into the suction valve. Check that the edges of the valve star (9) point upwards.
3. Attach the cylinder set (13) to the valve block (16). Check that the notches of the cylinder set are placed exactly over the spikes of the valve block.
4. Tighten the glass cylinder (15) with the cap nut (5). Check that all parts fit tightly.
5. Slide the outer housing (2) on the cylinder (15).
6. Place the device horizontally and mount the quick lock knob (3) into the slot of the outer housing (2).
7. Than clip the adaptor ring (4) to the outer housing (2).
8. Push the piston (14) into the cylinder (15) until it stops.
9. Attach the fix screw (1) to the outer housing (2).
10. Attach the discharge tube (7) to the valve axle (12).
11. Slide the protective sleeve (6) over the attached discharge tube (7+12).
12. Push the return tube (18) and the suction tube (17) into the valve block (16).
13. Screw the assembled device on the reagent bottle.

5.6 Maintenance

To avoid valve clogging, clean the dispenser when you don‘t use it for a while (see 5.2).

Release clogged valves with a thin object (wire, paper clip etc.) by pushing the upper side of the ejection valve (11) and / or the bottom side of the suction valve (8). Make sure that you rinse the valves residue-free, since clogged valves may lead to leakage of the device.

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