



# Varipette® 4720

**Operating manual**

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# 1 Operating instructions





## 1.1 Using this manual

- ▶ Read this operating manual completely before using the device for the first time. Observe the instructions for use of the accessories where applicable.
- ▶ This operating manual is part of the product. Please keep it in a place that is easily accessible.
- ▶ Enclose this operating manual when transferring the device to third parties.
- ▶ The current version of the operating manual for all available languages can be found on our webpage [www.eppendorf.com/manuals](http://www.eppendorf.com/manuals).

## 1.2 Danger symbols and danger levels

### 1.2.1 Danger symbols


The safety instructions in this manual have the following danger symbols and danger levels:

	<b>Biohazard</b>		<b>Toxic substances</b>
	<b>Hazard point</b>		<b>Material damage</b>

### 1.2.2 Danger levels

<b>DANGER</b>	<i>Will</i> lead to severe injuries or death.
<b>WARNING</b>	<i>May</i> lead to severe injuries or death.
<b>CAUTION</b>	May lead to light to moderate injuries.
<b>NOTICE</b>	May lead to material damage.

## 1.3 Symbols used

Depiction	Meaning
1.	Actions in the specified order
2.	
▶	Actions without a specified order
•	List
<i>Text</i>	Display or software texts
	Additional information

## 2 Product description

### 2.1 Delivery package

Quantity	Description
1	Varipette 4720
1	Varitips P
1	Dispensing part (Varitips S system)
2	Maxitip (long tip, graduated)
10	Valves

### 2.2 Product overview

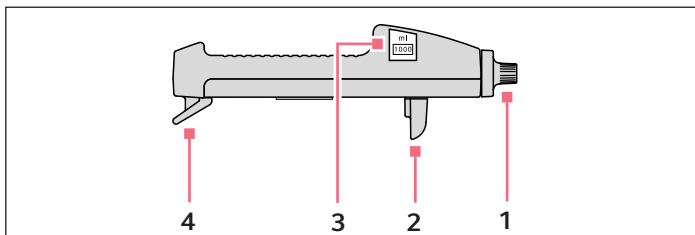


Fig. 2-1: Varipette

#### 1 Rotary knob for setting volume

#### 3 Volume display

#### 2 Control button

#### 4 Clamping lever

Liquid is aspirated by pressing down the control button as far as it will go and then dispensed by applying pressure once again.

For clamping the Varitips piston.

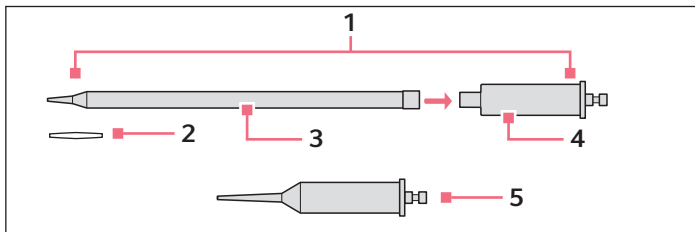


Fig. 2-2: Varitips

**1 Varitips S system**

Dispensing part (Varitips S) + Maxitip

**2 Valve**

For Maxitip

**3 Maxitip**

The Maxitip is attached to the dispensing part and can be replaced.

**4 Dispensing part**

2.50 mL – 10.00 mL

**5 Varitips P**

1.00 mL – 10.00 mL (P = positive displacement)

**2.3 Features**

The Varipette is a universal, variable milliliter pipette covering 1.00 to 10.0 mL. It may be used to accurately prepare and dispense any required volume in 10 µL increments.

This versatile Varipette can be used to dispense:

- aqueous solutions,
- organic liquids,
- liquids with increased viscosity and
- liquids whose density and vapor pressure deviate significantly from water.

The Varipette is only functional when used in combination with a Varitip: comprising a piston, cylinder and tip, the Varitip aspirates the liquid.

Varitips properties:

- Varitips P  
 Dosage volume 1.00 to 10.00 mL, with short tip and positive displacement.

**Product description**

Varipette® 4720

English (EN)

- Varitips S with Maxitip

Dosage volume 2.50 to 10.00 mL. Liquid can be removed from tall and narrow-necked vessels using the long Maxitip (diameter = 10 mm, suitable for volumetric flasks with standard taper joint 12/21). The liquid only goes as far as the Maxitip, which means samples or reagents can be dispensed one after the other without any carryover by simply replacing the Maxitip.

The valve inserted into the tip of the Maxitip facilitates the safe transfer of aggressive or toxic solutions, or liquids with radioactive or pathogenic elements.

## 2.4 Varitips areas of application

Varitips P and Varitips S complement each other in terms of function.

The recommended areas of application can be found in the table:

	Varitips P	Varitips S
Aqueous solutions	+	+
Removal of liquid from deep vessels	-	+
Organic liquids (e.g. alcohols, org. acids)	+	+
Solvents with high vapor pressure (e.g. diethyl ether)	+	+
Liquids with high density	+	+
Viscous liquids	+	-

### 2.4.1 Materials



**NOTICE!** Aggressive substances may damage components, consumables and accessories.

- ▶ Check the chemical resistance before using organic solvents or aggressive chemicals.
- ▶ Only use liquids whose vapors do not attack the materials used.

Component	Material
Piston	• Polyethylene (PE)
Cylinder	• Polypropylene (PP)
Valve	• Polypropylene (PP)



## 3 Safety

### 3.1 Intended use

The Eppendorf Varipette 4720 is intended for dispensing liquids. In-vivo applications (in or on the human body) are not allowed.

The Eppendorf Varipette 4720 may only be operated by trained specialists. All users must read the operating manual carefully and must have become familiar with the device's mode of operation.

### 3.2 Warnings for intended use

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#### **WARNING! Damage to health due to infectious liquids and pathogenic germs.**

- ▶ When handling infectious liquids and pathogenic germs, observe the national regulations, the biosafety level of your laboratory, the material safety data sheets, and the manufacturer's application notes.
- ▶ Wear your personal protective equipment.
- ▶ For comprehensive regulations about handling germs or biological material of risk group II or higher, please refer to the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, the current edition).



#### **WARNING! Damage to health due to toxic, radioactive or aggressive chemicals.**

- ▶ Wear your personal protective equipment.
- ▶ Observe the national regulations for handling these substances.
- ▶ Observe the material safety data sheets and manufacturer's application notes.



#### **CAUTION! Danger to people due to grossly negligent use.**

- ▶ Never point the opening of the device towards yourself or others.
- ▶ Only initiate liquid dispensing if it is safe to do so.
- ▶ For all dispensing tasks, make sure that you are not endangering yourself or anyone else.



#### **CAUTION! Poor safety due to incorrect accessories and spare parts.**

The use of accessories and spare parts other than those recommended by Eppendorf may impair the safety, functioning and precision of the device. Eppendorf may not be held liable or accept any liability for damage resulting from the use of accessories and spare parts other than those recommended, or from the improper use of such equipment.

- ▶ Only use accessories and original spare parts recommended by Eppendorf.
-

## 4 Operation

### 4.1 Attaching/removing the Varitips

- i** Press and hold the control button during the entire attachment/removal process.



Fig. 4-3: Inserting the Varitips

1. Keep pressing the control button until the clamping device has been pushed down completely. Keep the control button pressed.
2. Raise the clamping lever.
3. Press and slightly rotate the Varitips P or Varitips S dispensing part into the bracket (or remove from bracket when disassembling). The coupling piece of the piston automatically slides between the jaws of the clamping device when inserted.
4. If necessary, gently push in the coupling piece completely.
5. Fold down the clamping lever and press firmly.
6. Slowly slide the control button to the upper stop. Do not let the control button snap back.

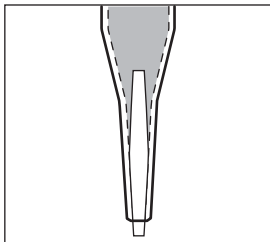


Fig. 4-4: Valve in Maxitip

7. For Maxitip: Insert either end of the valve into the Maxitip. The valve seals the tip of the Maxitip and prevents any leakage of the liquid.
8. Attach the Maxitip to the dispensing part.

## 4.2 Setting the volume



- ▶ Turn the selection dial until the required volume is displayed. The individual digits of the volume display must entirely show in the viewing window. The volume is displayed in mL in 4 digits with two decimal spaces.

Fig. 4-5: Setting the volume

## 4.3 Pre-wetting

An accurate pipetting process requires pre-wetting of the Varitips P and Maxitip.

- ▶ Aspirate and dispense the liquid three times.  
 The tip is pre-wetted.

After pre-wetting, the amount of fluid dispensed corresponds exactly to the previously recorded set volume.

## 4.4 Pipetting with the Varitips P

### 4.4.1 Aspirating liquid

1. Immerse the tip of the Varitips P in the liquid.
2. Slowly press down the pipetting lever up to the lower stop.
3. Wait for 2 seconds before letting the pipetting lever slide upward slowly.

- i** A small air bubble is left behind in the cylinder of the Varitips P after filling. This has no effect on the accuracy and precision of dispensing.

### 4.4.2 Dispensing liquid

You can dispense the liquid from the Varitips P freely or against the inner wall of the vessel.

1. Slowly press down the pipetting lever until it reaches the lower stop.
  2. Remove any residual droplets left behind on the tip by wiping the tip on the vessel wall.
  3. Let the pipetting lever slide back slowly to the upper stop.
- i** Liquids remaining in the Varitips P after pre-wetting and pipetting are not part of the dispensing volume.

## 4.5 Pipetting with Varitips S



Fig. 4-6: Aspirating the liquid



Fig. 4-7: Dispensing the liquid

There is no difference between the pipetting process for Varitips S and for Varitips P.

Please also note the following:

- ▶ Always keep the pipette in an upright position when aspirating liquid.
- ▶ When dispensing the liquid, hold the tip of the Maxitip at the tube inner wall.
- ▶ When dispensing the liquid, hold the long tip of the Varitips S at the tube inner wall.

If there is residue left in the tip from heavily wetted liquids, remove this from the tip with an additional stroke:

1. Slide the control button upwards.
2. Press the control button to pull the piston slightly upwards.
3. Press the control button again to dispense the liquid.

### 4.5.1 Pipetting with the Maxitip and valve

The valve seals the tip of the Maxitip with its own weight (density = 1.78 g/L).

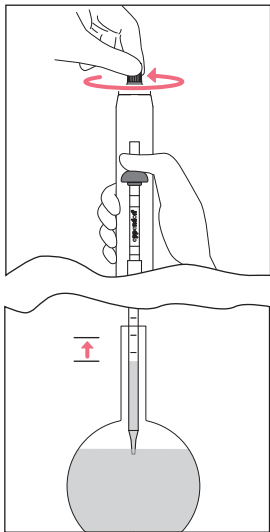
- ▶ Before aspirating the liquid, place the Maxitip tip against the tube inner wall and push back the valve once.  
 During liquid aspiration, the liquid flowing in lifts the valve.
- ▶ Keep the pipette with filled Maxitip and valve upright when transporting.
- ▶ When dispensing the liquid (generally with downflow of piston), place the Maxitip tip at an angle to the tube inner wall and push up the valve.
- ▶ Hold the source and destination vessel with your other hand.

## 4.6 Liquid with special properties

Liquids which deviate significantly from water in terms of density and vapor pressure can be dispensed with the Varitips S.

With the Maxitip, you determine the set values required.

### 4.6.1 Adjusting rotary knob for volume correction



1. Attach the Maxitip.
2. Set the preferred volume using the rotary knob.
3. Aspirate the liquid, keep the control button pressed.
4. Adjust the rotary knob until the liquid meniscus has reached the corresponding graduation mark. Turning clockwise: Raising the liquid. Turning anti-clockwise: Lowering the liquid.
5. Read the set value determined for the preferred volume at the volume display.
6. Dispense the volume from the Maxitip.

Fig. 4-8: Correcting the volume

- i** • For liquids with high vapor pressure, keep aspirating and dispensing the liquid until there are no more gas bubbles pressed from the tip.
- For viscous liquids, we recommend the Varitips P.

## 5 Gravimetric check of liquids with special physical properties

The Varipette measurement setting may be switched from volumetric to gravimetric if liquids with particularly physical properties are to be dispensed. To this end, the pipetted volume is weighed at the set value.

New set value =

$$2 \times \text{nominal value} - \frac{\text{Weight of pipetted liquid}}{\text{Density of pipetted liquid}}$$

Gravimetrically check the value determined also, and correct if necessary.

## 6 Troubleshooting

### 6.1 Error search

Error	Cause	Remedy
Pipetting lever cannot be pressed down completely.	Clamping lever is not fully pressed down.	▶ Properly insert the piston, completely press down the clamping lever.
Piston cannot be controlled via the pipetting lever.	Pipetting lever is not pressed down up to the stop.	▶ Push down the pipetting lever all the way up to the stop.
Incorrect dispensing volume.	Pipetting lever not fully pressed down during liquid aspiration.	▶ Always press down the pipetting lever up to the lower stop; the lower stop varies with the dispensing volume.
	Clamping lever is not fully pressed down.	▶ Properly insert the piston, completely press down the clamping lever.
	Liquid with deviating density, high vapor pressure.	▶ volum./grav. check
Varitip drips.	Piston does not seal.	▶ Exchange Varitip.
	Maxitip not firmly fit onto the dispensing unit.	▶ Plug in long tip.
	Liquid with high steam pressure/low viscosity.	▶ Insert valve into the Maxitip.
Droplets in the tip of the Maxitip.	Increased wetting of the plastic.	▶ Exchange Maxitip.

Regularly check the precision and accuracy of the Varipette to prevent dispensing errors. An SOP (Standard Operation Procedure) for checking pipettes can be found on our website [www.eppendorf.com](http://www.eppendorf.com).

The settings must be adjusted for such liquids whose physical properties substantially differ from those of water.

## 7 Maintenance

### 7.1 Cleaning



**NOTICE! Damage to device from unsuitable cleaning agents or sharp or pointed objects.**

Use of unsuitable cleaning agents may damage the device.

- ▶ Do not use corrosive cleaning agents, strong solvents or abrasive polishes.
- ▶ Check the compatibility with the materials used.
- ▶ Do **not** clean the device with acetone or organic solvents with a similar effect.
- ▶ Do **not** use sharp or pointed objects to clean the device.

Proceed as follows:

1. Use a soft, damp cloth and mild cleaning agent to remove any contamination from the exterior and to wipe down the housing.
2. To disinfect the Varipette, wipe down the housing with isopropyl alcohol (70%).

### 7.2 Decontamination before shipment



**CAUTION! Use of a contaminated device may result in personal injury and damage to the device.**

- ▶ Clean and decontaminate the device in accordance with the cleaning instructions before shipping or storage.

Hazardous substances are:

- solutions presenting a hazard to health
- potentially infectious agents
- organic solvents and reagents
- radioactive substances
- proteins presenting a hazard to health
- DNA

1. Please note the information in the document "Decontamination certificate for product returns".

It is available as a PDF document on our website

[www.eppendorf.com/decontamination](http://www.eppendorf.com/decontamination).

2. Enter the serial number of the device in the decontamination certificate.
3. Enclose the completed decontamination certificate for returned goods with the device.
4. Send the device to Eppendorf AG or an authorized service center.

## 8 Technical data

Model	Test tip	Testing volume	Error of measurement			
			systematic		random	
			± %	± mL	± %	± mL
2.5 mL – 10 mL	Varitips S-System	2.5 mL	1.0	0.025	0.2	0.005
		5 mL	0.4	0.02	0.2	0.01
		10 mL	0.3	0.03	0.2	0.02
1 mL – 10 mL	Varitips P	1 mL	0.6	0.006	0.3	0.003
		5 mL	0.5	0.025	0.15	0.0075
		10 mL	0.3	0.03	0.1	0.01

### 8.1 Test conditions

Test conditions and test evaluation in compliance with ISO 8655, Part 6. Tested using a standardized analytical balance with evaporation protection.

**i** The three largest testing volumes per tip (10 %, 50 %, 100 % of the nominal volume) correspond to the specifications in accordance with ISO 8655, Part 2 or Part 5. The test is to be carried out with these three testing volumes for testing of the systematic and random error in compliance with the standard.

- Number of determinations per volume: 10
- Water according to ISO 3696
- Inspection at 20 °C – 27 °C  
Maximum temperature variation during measurement ±0.5 °C
- Dispensing onto the tube inner wall

### 8.2 Ambient conditions

	Temperature range	Relative humidity
Storage without transport package	-5 °C — 45 °C	10 % — 95 %
Operating conditions	5 °C — 40 °C	10 % — 95 %



## 9 Ordering information



### **CAUTION! Poor safety due to incorrect accessories and spare parts.**

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- ▶ Only use accessories and original spare parts recommended by Eppendorf.

Order no. (International)	Description
4720 000.011	<b>Eppendorf Varipette 4720</b> with continuous volume adjustment 1 – 10 mL
0030 048.130	<b>Eppendorf Varitips P</b> Positive displacement system 100 pieces
0030 050.525	<b>Eppendorf Varitips S Starter Kit</b> 100 Maxitips, 10 dispensing parts, 10 valves
0030 050.533	<b>Eppendorf Varitips S</b> Dispensing part 30 pieces
0030 050.568	<b>Maxitip, graduated</b> for Eppendorf Varitips S 200 pieces
0030 050.541	<b>Eppendorf Varitips S</b> Valve for Maxitip 100 pieces
4981 203.009	<b>Wall mount for Multipette plus, Repeater plus, Varipette</b> with adhesive surface





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