

# microman<sup>®</sup>

E

## User Guide

EN



 **GILSON<sup>®</sup>**



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#### **NOTICE**

Before use, please carefully read [WARRANTY](#) on page 18 of this User's Guide!



## INTRODUCTION



The ergonomically designed MICROMAN® E positive-displacement pipettes, along with disposable capillary piston (CP) tips, provide the highest precision when pipetting viscous, volatile, or non-aqueous liquids. Capillary pistons eliminate the air cushion between the sample and disposable piston, ensuring the accuracy of the pipette is not affected by the physical properties of the sample.

Positive-displacement technology is the ideal solution to prevent from aerosol contamination or sample carry-over, thus protecting the pipette, the user, and the sample.

MICROMAN E is available as variable volume single-channel models, with six models covering a volume range from 1 to 1000 µL. M25E, M50E, and M250E, with thin and tall capillary pistons (CPs) are especially suited for use with tall or narrow vessels.

Designed with comfort in mind, MICROMAN E is a must for every workflow and application thanks to its main features:

- **QuickSnap system** for a direct fitting of the CPs: fitting is as easy as fitting a tip on an air displacement pipette
- Improved **ergonomic handle** shape that rests comfortably in hand
- **Volume control switch** to avoid any accidental volume change when pipetting
- **Complete and reliable pipetting** of challenging fluids: performances remain unaffected by the physical properties of the fluids, or at different temperatures
- MICROMAN E and CPs are the strongest barrier against residual sample carryover, aerosol contamination, and cross-contamination. They provide a **triple protection**: you, your sample, and your pipette are protected.



## Parts Checklist

Verify that the following items are present:

- MICROMAN E,
- User's Guide,
- Safety bag,
- Adhesive ID-tags (strip of 6),
- Capillary pistons (10),
- Certificate of conformity (including barcode sticker).

## Good Laboratory Practice (GLP) Features

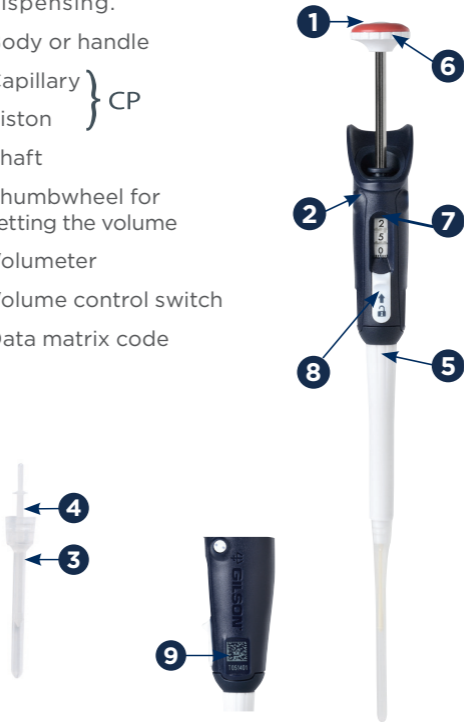
- No need to touch disposables (capillary piston).
- Serial Number: engraved on pipette body.
- Barcode: on the box and with the certificate (can be transferred).
- ID Tag (Application or User).
- Color-coded push button indicating the volume range.
- Data matrix engraved on pipette body.
- Gilson certificate of conformity according to ISO 8655.



**Figure 1**  
Data Matrix and  
Serial Number  
Location

## Description

- 1 Color-coded push button indicating the volume range for aspirating and dispensing.
- 2 Body or handle
- 3 Capillary } CP
- 4 Piston } CP
- 5 Shaft
- 6 Thumbwheel for setting the volume
- 7 Volumeter
- 8 Volume control switch
- 9 Data matrix code



**Figure 2**  
MICROMAN® E Description



# Operating Ranges and Material

## Available Models

Model	Part Number	Capillary Pistons	Volume Range
M10E	FD10001	CP10/CP10ST	1 $\mu$ L to 10 $\mu$ L
M25E	FD10002	CP25/CP25ST	3 $\mu$ L to 25 $\mu$ L
M50E	FD10003	CP50/CP50ST	20 $\mu$ L to 50 $\mu$ L
M100E	FD10004	CP100/CP100ST	10 $\mu$ L to 100 $\mu$ L
M250E	FD10005	CP250/CP250ST	50 $\mu$ L to 250 $\mu$ L
M1000E	FD10006	CP1000/CP1000ST	100 $\mu$ L to 1000 $\mu$ L

## Materials

MICROMAN® E				
Model	Spring (A)	Clamp (B)	Shaft (C)	Body (D)
M10E	SS	Be Alloy	PBT	PVDF/PP
M25E	SS	Be Alloy	PVDF	PVDF/PP
M50E	SS	Be Alloy	PVDF	PVDF/PP
M100E	SS	Be Alloy	PBT	PVDF/PP
M250E	SS	Be Alloy	PVDF	PVDF/PP
M1000E	SS	Be Alloy	PVDF	PVDF/PP

CAPILLARY PISTONS		
Model	Capillary (E)	Piston (F)
CP10	PP	LCP
CP25	PP	LCP
CP50	PP	LCP
CP100	PP	PE
CP250	PP	PE
CP1000	PP	POM

**NOTE**

For more information on chemical resistance of plastic materials, please refer to the LT800550 Gilson Guide to Pipetting - Appendix E, on [www.gilson.com](http://www.gilson.com).

### Abbreviations

SS = Stainless Steel

Be = Beryllium

PBT = Polybutylene Terephthalate

PP = Polypropylene

PVDF = Polyvinylidene Fluoride

LCP = Liquid Crystal Polymer

PE = Polyethylene

POM = Polyacetal

## Specifications

MICROMAN E is a high quality pipette that offers excellent accuracy and precision. The figures provided in the **Gilson Maximum Permissible Errors** on page 8, table were obtained using Gilson CPs. These figures are only guaranteed when using genuine Gilson CPs.

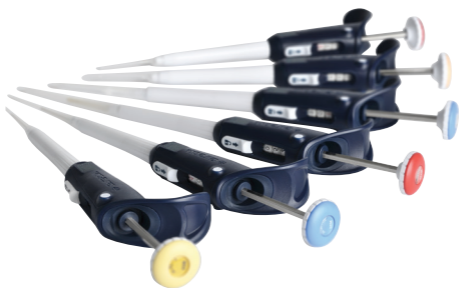
Each pipette is inspected and validated by qualified technicians according to the Gilson quality system.

Gilson declares that its manufactured pipettes comply with the requirements of the ISO 8655 standard, by type testing. The adjustment is carried out under strictly defined and monitored conditions (ISO 8655-6):

- Basis of adjustment, Ex.
- Reference temperature, 20°C
- Relative humidity, 50%
- Barometric pressure, 101 kPa
- Use of distilled water grade 3 (ISO 3696)
- Ten measurements for each test volume, which are nominal volume, 50% of nominal volume, and the minimum or 10% of nominal volume.

## Performance Tests

Each pipette is inspected and validated according to the Gilson quality assurance system. Based on extensive historical data, manufacturing conditions, and expertise, and in compliance with ISO standards relative to statistical process control, the assurance level of this instrument performing to specifications is 99.8%. Specifications rely on quality and consistency for the whole pipetting system and are guaranteed only when the pipette is used with Gilson capillary pistons.





# Gilson Maximum Permissible Errors

MICROMAN® E										
Nom. Vol. (µL)	Vol. (µL)	Vol. (%)	Maximum Permissible Errors							
			Gilson				ISO 8655-2 (Table 3)			
			Systematic Error (µL)	Random Error (µL)	Systematic Error (%)	Random Error (CV)*	Systematic Error (µL)	Random Error (µL)	Systematic Error (%)	Random Error (CV)*
<b>M10E (P/N FD10001) WITH CP10 AND CP10ST</b>										
10	1	10	±0.090	≤0.030	± 9.0	≤ 3.00	± 0.200	≤ 0.100	± 20	≤ 10
	5	50	± 0.100	≤0.030	± 2.0	≤ 0.60	± 0.200	≤ 0.100	± 4.0	≤ 2.0
	10	100	± 0.150	≤0.060	± 1.5	≤ 0.60	± 0.200	≤ 0.100	± 2.0	≤ 1.0
<b>M25E (P/N FD10002) WITH CP25 AND CP25ST</b>										
25	3	12.0	± 0.25	≤0.080	± 8.3	≤ 2.67	± 0.35	≤ 0.15	± 11.67	≤ 5.0
	10	40.0	± 0.27	≤0.080	± 2.7	≤ 0.80	± 0.35	≤ 0.15	± 3.5	≤ 1.5
	25	100	± 0.30	≤0.100	± 1.2	≤ 0.40	± 0.35	≤ 0.15	± 1.4	≤ 0.60
<b>M50E (P/N FD10003) WITH CP50 AND CP50ST</b>										
50	20	40.0	± 0.34	≤ 0.20	± 1.7	≤ 1.00	± 0.70	≤ 0.30	± 3.5	≤ 1.5
	50	100	± 0.70	≤ 0.30	± 1.4	≤ 0.60	± 0.70	≤ 0.30	± 1.4	≤ 0.60
<b>M100E (P/N FD10004) WITH CP100 AND CP100ST</b>										
100	10	10	± 0.50	≤ 0.20	± 5.0	≤ 2.00	± 1.4	≤ 0.6	± 14	≤ 6.0
	50	50	± 0.75	≤ 0.30	± 1.5	≤ 0.60	± 1.4	≤ 0.6	± 2.8	≤ 1.2
	100	100	± 1.00	≤ 0.40	± 1.0	≤ 0.40	± 1.4	≤ 0.6	± 1.4	≤ 0.60
<b>M250E (P/N FD10005) WITH CP250 AND CP250ST</b>										
250	50	20.0	± 1.50	≤ 0.30	± 3.0	≤ 0.60	± 3.0	≤ 1.0	± 6.0	≤ 2.0
	100	40.0	± 1.70	≤ 0.30	± 1.7	≤ 0.30	± 3.0	≤ 1.0	± 3.0	≤ 1.0
	250	100	± 2.50	≤ 0.50	± 1.0	≤ 0.20	± 3.0	≤ 1.0	± 1.2	≤ 0.40
<b>M1000E (P/N FD10006) WITH CP1000 AND CP1000ST</b>										
1000	100	10	± 3.0	≤ 1.6	± 3.0	≤ 1.60	± 12	≤ 4.0	± 12	≤ 4.0
	500	50	± 5.0	≤ 2.5	± 1.0	≤ 0.50	± 12	≤ 4.0	± 2.4	≤ 0.80
	1000	100	± 8.0	≤ 4.0	± 0.8	≤ 0.40	± 12	≤ 4.0	± 1.2	≤ 0.40

\*CV means Coefficient of Variation (%)

**NOTE**

With a precise pipetting technique, the M25E model can be used to aspirate volumes as low as 2.5 µL (10% of the nominal volume of the pipette).

# FITTING THE CAPILLARY PISTON

Make sure the capillary piston (CP) is compatible with the MICROMAN E model that will be used.

## CP10, CP25, CP50, CP100, CP250, and CP1000 TIPACK

Capillary pistons (CP) are delivered ready to use. To fit a capillary piston:

1. Press the MICROMAN E onto the capillary piston until it is firmly seated **1**.
2. Pick up the CP from the rack **2**.
3. Slowly press the push button until you feel and hear a **slight click** and **continue to press to the first stop** **3**.
4. Pre-wet the CP, and then aspirate the liquid.
5. Press the push button on **the second stop to eject the CP** **3**.



**Figure 3**

CP fitting on MICROMAN® E

**NOTE**

Pre-wetting the CP before pipetting helps prepare the CP for the best pipetting performance. Pre-wetting the CP helps ensure that volumes that you pipette will achieve accuracy and precision within specifications.

## CP25, CP50, and CP250 Bulk

The capillaries and pistons are delivered in two separate boxes.

To fit a capillary piston:

1. Take care not to damage the sealing tip **1** when handling the piston **3**.
2. Select a piston **3** and slide it into the capillary **4**.
3. Gently push the capillary until it snaps onto the capillary holder.
4. Attach the stem **2** by slowly pressing MICROMAN E's push button until you feel and hear a slight click and then continue to press to the first stop.
5. Pre-wet the CP, and then aspirate the liquid.



**Figure 4**  
MICROMAN® E  
Capillary Piston

### NOTICE

Never lubricate the capillary holder, capillary, or any other part of the pipette. If the capillary tends to slip off the capillary holder, clean the capillary holder with ethanol, using a medical wipe or similar soft tissue.

# Chapter 3

## PIPETTING



### Setting the Volume

The volume of liquid to be aspirated is set using the volumeter. The volumeter consists of three number dials, which are read from top (most significant digit) to bottom (least significant digit). A marker is used to set exact or intermediate volumes using the scale on the bottom dial. The dials are colored either black or red to indicate the position of the decimal point, according to the model (see examples).

M10E	M25E	M50E	M100E	M250E	M1000E
0 6 8	0 6 8	3 6 8	0 6 8	1 6 8	0 7 5
6.8 $\mu$ L	6.8 $\mu$ L	36.8 $\mu$ L	68 $\mu$ L	168 $\mu$ L	0.75 mL

The volume is set by turning the thumbwheel slowly to reach the required setting.

COLOR OF VOLUMETER NUMBERS			
MODEL	BLACK	RED	INCREMENT
M10E, M25E, M50E	$\mu$ L	0.1 $\mu$ L	0.02 $\mu$ L
M100E, M250E	$\mu$ L	none	0.2 $\mu$ L
M1000E	0.1 and 0.01 mL	mL	2 $\mu$ L

**For small volume changes**, directly and slowly turn the thumbwheel. Fine volume adjustments can be done without sliding the volume control switch. To obtain maximum accuracy when setting the volume, proceed as follows:

- when **decreasing** the volume setting, slowly reach the required setting, making sure not to overshoot the mark.
- when **increasing** the volume setting, pass the required value by 1/3 of a turn and then slowly decrease to reach the volume, making sure not to pass the setting.



#### NOTE

The volume control switch is a safety to prevent accidental volume change. The thumbwheel can still be turned when the switch is not slid, but the pipetting rod is much harder to turn, and you will hear click sounds.



**For large volume changes**, use the volume control switch and proceed as follows:

1. Slide and hold the volume control switch for an easy and quick volume setting. The thumbwheel will turn faster, without resistance and click.
2. When **decreasing** the volume setting, approach the required setting, by 1/3 of a turn. When **increasing** the volume setting, pass the required setting by 1/3 of a turn.
3. Release the unlock button button.



### Pre-Wetting the CP

Greater uniformity and precision of dispensing are usually obtained by providing identical contact surfaces for all aliquots. This is achieved by pre-wetting with the same liquid that is being dispensed.

To pre-wet, immerse the CP in the liquid and perform one pipetting step. Liquid can be dispensed back into the original reservoir or to waste.

### Aspirating

1. Press the push button to the first stop (refer to Figure 5 on page 13),
2. Immerse the capillary 2 mm into the liquid,
3. **Slowly release the push button to draw up the liquid (rest position),**
4. Wipe any liquid from the outside of the capillary, taking care not to touch the orifice.





## Dispensing

Place the end of the capillary against the inside wall of the recipient vessel,

1. Press the push button slowly to the first stop (refer to Figure 5 below),
2. Keeping the push button depressed, move the capillary away from the sidewall,

Withdraw MICROMAN E from the vessel and release the push button.

### NOTE

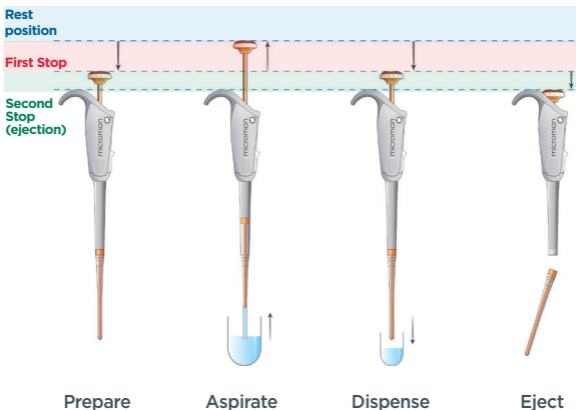
Unlike air-displacement pipettes, MICROMAN E does not have any air cushion and there is no purge needed. Pushing the push button to the second stop will eject the CP.

## Ejecting the Capillary Piston

- Once the push button has been pressed to the first stop, press down harder to the second stop; at this point the piston and capillary are ejected simultaneously (refer to Figure 5 below).

### NOTE

MICROMAN E is automatically adjusted when the capillary piston is correctly fitted. Once the volume is set, measurements will be accurate and precise.



**Figure 5**

Positive-Displacement - Forward Mode Pipetting

# TROUBLESHOOTING

You may be able to identify and correct the problem by referring to the following information. If you cannot solve the problem, please contact your local Gilson representative.

### **Leaks:**

Replace the capillary piston.

### **No stroke:**

The piston is not properly fitted into the clamp; check that the piston is seated correctly (refer to page 9). Without any capillary piston, press the push button to the first stop, and then press down harder to the second stop.

### **Difficult to fit a capillary:**

Clean the capillary holder with ethanol. Without any capillary piston, press the push button to the first stop, and then press down harder to the second stop.

### **Inaccuracy:**

Make sure the capillary is correctly mounted on the capillary holder (refer to [CHAPTER 2, FITTING THE CAPILLARY PISTON](#), pages 9).

### **Imprecision:**

Replace the capillary piston.

### **Difficult to set the volume:**

This suggests internal damage to the pipette. Contact your local Gilson representative.

### **If the problem persists...**

Contact your local Gilson representative.



# CLEANING AND DECONTAMINATION



MICROMAN E is designed so that parts normally in contact with liquid contaminants are easy to clean and decontaminate.

### Cleaning

Clean the pipette with soap solution prior to decontamination.

#### External

1. Wipe the entire pipette with a soft cloth or lint-free tissue soaked with soap solution to remove any stains. If the pipette is very dirty, a brush with soft plastic bristles may be used.
2. Wipe the entire pipette with a soft cloth or lint-free tissue soaked with distilled water.
3. Leave the parts to dry by evaporation or wipe them down with a clean soft cloth or lint-free tissue.

**WARNING**

Before returning any pipette, ensure that it is completely free of chemical, biological, or radioactive contamination. Use the safety bag provided by Gilson.

#### Internal

Only the following components should be immersed in a decontaminant solution: clamp assembly, return spring, and capillary holder (shaft).

1. Unscrew the capillary holder (shaft).
2. Remove the clamp assembly and return spring from the shaft.
3. Set aside the body (handle) in a dry and secure location.



4. Clean the individual components using an ultrasonic bath (for 20 minutes at 50°C) or with a soft cloth and brush. Small round brushes with soft plastic bristles may be used to clean the interior of the shaft.
5. Rinse the individual components with distilled water.
6. Leave the parts to dry by evaporation or wipe them down with a clean soft cloth or lint-free tissue.
7. Reassemble the pipette.

## Decontamination

You may refer to the Decontamination Procedure LT802288 available at [www.gilson.com](http://www.gilson.com).

### Chemical Decontamination

Clean the pipette prior to decontamination. Full details of recommended decontamination procedures for Gilson pipettes are available from your supplier. Whichever decontaminant you use, check with the supplier that the product is compatible with the materials used for the component parts of the pipette, and that does not attack any of the following plastics and metals: polyester, PVDF (polyvinylidene fluoride), PP (polypropylene), PBT (polybutylene terephthalate), PC (polycarbonate), SS (stainless steel), and BE Alloy (beryllium)

### Non-immersible Parts

1. Wipe the body (handle) of the pipette with a soft cloth or lint-free tissue impregnated with the chosen decontaminant.
2. Wipe the body (handle) of the pipette with a soft cloth or lint-free tissue impregnated with distilled water or sterilized water.

### Immersible Parts

Only the following components should be immersed in a decontaminant solution: clamp assembly, return spring and capillary holder (shaft).

1. Unscrew the capillary holder (shaft).
2. Remove the clamp assembly and return spring from the shaft.
3. Set aside the body (handle) in a dry and secure location.

4. Immerse the components in the decontaminant solution or wipe them down according to the instructions provided by the manufacturer or supplier of the decontaminant.
5. Rinse the individual components with distilled or sterilized water.
6. Leave the parts to dry by evaporation or wipe them with a clean lint-free tissue or a soft cloth.
7. Reassemble the pipette.





## Chapter 6

# WARRANTY

## WARRANTY

Gilson warrants this pipette against defects in material under normal use and service for a period of 12 months from the date of purchase.

This warranty shall not apply to pipettes which are subject to abnormal use and/or improper or inadequate maintenance (contrary to the recommendations given in the User's Guide), including, but not limited to pipettes which have been subjected to physical damage, improper handling, spillage or exposure to any corrosive environment. This warranty shall also be void in the event pipettes are altered or modified by any party other than Gilson or its designates. Gilson's sole liability under this warranty shall be limited to, at Gilson's sole option, repair or replacement of any defective components of pipettes or refund of the purchase price paid for such pipettes.

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