MULTI PIPETTES SLAMED 12 CHANNEL GRMANY

User Manual











instruments for sciences

Ratiolab GmbH · Am Siebenstein 12 63303 Dreieich, Germany · Tel. +49 (0) 6103 30025-0 Fax +49 (0) 6103 30025-55 · info@ratiolab.com

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1- INTRODUCTION

MULTI MATE series of adjustable multichannel pipettes have been designed for the filling of laboi'atory microplates. The pipettes enable precise and simultaneous delivery of 8 or 12 preset-vol-unne doses of liquid.

MULTI MATE pipettes are equipped with a digital readout counter, built into the pipette's handle, for measurinq Coses, (Fig. 1F). Volume settings are continousiy adjustable and are controlled by means of the rotating calibration knob, (Fig I B). The volume range of the pipette is shown on the pipetting pushbutton, (Fig. 1A).

MULTI MATE pipettes should be used with disposable polypropylene tips, to ensure safety and accuracy, (Fig. 1C). The shafts without O-rings ensure the compatibility of the pipettes with a trroad assortment of tips, and the special ejector shape reduces the force required for their ejection. In order to protect the user against inadvertent contact with used tips, the pipettes are equipped with tip ejectors, (Fig. 1D). By turning the multichannel module clockwise in relation to the handle, (Fig. 2), it is possible to disable the ejector's operation in order to avoid accidental use, or to change its position in such a way as to make filling of microplaies more convenient.



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The specifications for accuracy and precision given in the following table are obtained using **SLAMED** tips. These figures are only guaranteed when **SLAMED** tips are used.

MULTI MATE 8 channel

	SPECIFICATIONS				
Model	Cat No.	Volume	Accuracy	Precision	
MODEI	.Gal. NO	[ul]	[%]	[%]	
ME-10	141.0	Min 1 5 Max 10	±8.0 ±4.0 ±2.0	±6.0 ±2.0 1.2 ±	
ME-50	14.1.1	Min 5 25 Max 50	±4.0 ±3.0 ±1.6	±2.5 ±1.2 ±0.6	
ME-200	-2 14.1	Min 20 100 Max 200	±3.0 ±1.5 ±1.0	±1.5 ±0.8 ±0.6	
ME-300	14.1.3	Min 50 150 Max 300	±1.6 ±1.2 ±1.0	±1.5 ±1.0 ±0.6	

MULTI MATE 12 channel

	SPECIFICATIONS				
Model	Cat No.	Volume	Accuracy	Precision	
WOUGI	.Jai. NO	[ul]	[%]	[%]	
		Min 1	±8.0	±6.0	
MT-10	14.2.0	5	±4.0	±2.0	
		Max 10	±2.0	±1.2	
		Min 5	±4.0	±2.5	
MT-50	14.2.1	25	±3.0	1.2 ±	
		Max 50	±1.6	±0.6	
	MT-200 14.2.2	Min 20	±3.0	1.5 ±	
MT-200		100	±15	±0.8	
		Max 200	±1.0	±0.6	
	_	Min 50	±1.6	±1.5	
MT-300 ⁻	.2.3	150	±1.2	1.0 ±	
		Max 300	±1.0	±0.6	

Conditions de contr6le: eau distill6e d temperature de 20+1"C.

L6s sp6cifications des performances volum6trigus de la pipette multicanaux sont le r6sultant de tests gravimetrigues rigoureux d6crits dans les recommandations de EN ISO 8655. La construction de la pipette permet a l'utilisateur le recalibrage selon les principes pr6sent6s dans le chapitre 5.

SETTING THE VOLUME

In order to set the volume of the dose to be deli-vered, the calibration knob with counter is used. The volume shown by the counter is represented by three digits, which should be read from top to bottom. Typical meter readings are shown in the following table:

Model	Counter readings	Set volume	Basic degree
ME-10 MT-10	0 3 5	pl 3.5	pl 0.02
ME-50 MT-50	0 6 <u>5</u>	pl 65	0.10pl
ME-200 MT-200	0 8 5	pl 85.0	pl 0.20
ME-300 MT-300	2 5 0	pl 250.0	pl 1.0

To achieve accurate delivery of the required volume, the operator should turn the calibration knob in the direction diminishing counter rea-dings. If the volume being currently set is higher then the previous one, the operator should turn the calibration knob 1/3 of a turn beyond the required value, and then slowly rotate it back-wards, observing diminishing readings, until the required value is achieved.

3- METHOD OF PIPETTING

Fit the tips onto cones of the multichannel mo-dule. When you put the tips on the shafts the pipette should be pressed against the tips in the box. The liquid aspirated into the tips should not flow out by gravity from properly fixed tips. While holding the pipette in vertical position, tips should be immersed in the liquid to a depth of 2-4 mm, and flushed once by drawing a dose of iiquid and dispensing it out with slow and steady movement.



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Ratiolab GmbH · Am Siebenstein 12 63303 Dreieich, Germany · Tel. +49 (0) 6103 30025-0 Fax +49 (0) 6103 30025-55 · info@ratiolab.com Nexrt, still holding the pipette vertically, the ope-rator should press the pipetting button until the first resistance point is felt, and immerse the tips in the liquid to the depth ot 2-4 mm, (Fig. 3B). Releasing the pipetting button with a slow and uniform movement during 2-3 seconds, the liquid should be drawn into the tips, (Fig. 38) which should then be lifted above the liquid's surface. The pipette should next be positioned at an angle of 10-45 degrees in relation to inner walls of the microplate cavities and tips should be emptied by pressing the pipetting button slowly until the first resistance point is felt (Fig. 3C). After waiting second, the pipetting button should be pressed to the second resis- tance point in order to expell remaining liquid (Fig. 3D). Then the tips shoutd be tiftbd out while maintaining contact between the ends of the tips and the inner walls of the cavities until the pipetting button has been relased, (Fig. 3E). Finally, pressing the ejector button, the operator should separate the tips from the cones, (Fig. 3F).

4- RECOMMENDATIONS

To achieve maximum safety, precision and reliability, the following principles should be observed:

- do not draw liquids without tips fitted on thepipette cones,
- · do not lay down ihe pipette with tips filled,
- · check if the tips are fitted properly,
- during operation, the pipette must be held vertically, tips should be immersed in liquid to the depth ot 2 to 4 milimeters and the pipet-ting buiton should be depressed and released slowly and evenly.
- new tips must be pre-wetted prior to pipetting,by drawing and expelling the liquid to be me-asured. This is especially impodant when wor-king with liquids of viscosities and densities different from that of water and in temperatu-res different from ambient temperature,

MULTI MATE PIPETTES 8 & 12 CHANNEL

- liquid which tend to wet the walls of the tips, such as serum, protein, organic solvents, should be pipetted much slower than aque-ous liquids,
- tips must be replaced with new ones, when changing from one liquid to another, or if drops of liquid remain inside the tips,

5- RECALIBRATION

SLAMED pipettes are calibrated by gravimetric at the,method, using **SLAMED** tips and distilled water temperature 20±1°C, according to EN ISO 8655.standard

In most cases an inaccuracy of the pipetted doses hetdepend on a leakage in the piston assembly or on orefcones. Therefore do not recalibrate a pipette be-.having made sure, that there is no leakage in it racy-If during pipette operation you find that the accu error (the difference between the real aspira-ted volume and the preset volume) exceeds the the permissible value given in the table in section 1, ried out-pipette recalibration procedure should be car.

Before starting the recalibration it is necessary to check whether the following requirements have been fulfilled during error determination:

- the ambient temperature, and the temperature of the pipette, tips and water was identical
- the density of the liquid used is close to that of distilled water
- the balance with appropriate sensitivity has been used

Volume checked [ul]	Balance sensitivity [mg]
10- 0.1	s 0.001
10-100	0.01>
100 <	s0.1

·mg/ul conversion factor has been taken into account
•the requirements given in sections 3 and 4 have been fulfilled racy-If the above conditions are satisfied and the accu sderror for selected volume given in section 1 excee the permissible value, the pipette recalibration .procedure should be carried out

The recalibration can be performed within one full turn of the key to the right or to the left only. Recalibration conditions:

Ambient temperature and the temperature of the pipette, tips and liquid should be within the range $20-25^{\circ}$ C and stabilised during weigh-ing within $\pm 0.5^{\circ}$ C

- Measurements should be conducted using distilled water
- Balance sensitivity should be suitable for the volume to be controlled
- Recalibration procedure:
- Set the dose volume depending on the pipettevolume according to the following table:

Model	Range of the pipette volumes [ul]	Preset volume [pl]	Permissible volumes [pl]	Volume change AV for full turn of the calibration key [pl] (increments 24)
ME-10 MT-10	1-10	1	0.92-1.08	0.33
ME-50 MT-50	5-50	5	5.2 - 4.8	1.67
ME-200 MT-200	20-200	20	19.4-20.6	6.30
ME-300 MT-300	300 - 50	50	49.2-50.8	10.00

- Perform three aspiration series (each series should include the aspirations from all chan-nels), weigh each time and calculate the aver-age value of the aspirations.
- Calculate average aspirated volume in pl mul- tiplying the average aspiration amount [mg] by the distilled water density coefficient [pllmg], which depends on temperature and pressure according to the following table:

Tama anatana [00]	Pressure [kPa]				
Temperature [°C]	95.0	101.3	105.0		
20	1.0028	1.0029	1.0029		
21	1.0030	1.0031	1.0031		
22	1.0032	1.0033	1.0033		
23	1.0034	1.0035	1.0036		
24	1.0037	1.0038	1.0038		
25	1.0039	1.0040	1.0040		



If the average aspirated volume exceeds the permissible value, the following should be done:

- Rerncve the pipetting pushbutton, (Fig. aA),
- Holding the volume setting knob to protect it against rotation, insert the calibration key into the cuts of the calibration screw, (Fig. 4Bi,
- Turn the key clockwise to reduce the aspirat-ed volume, or counter-clockwise to increase the volume. One full turn cf the calibration key changes the pipette aspiration volume by the amount given in the table, (Fig. aC),
- Take out the key and fix the pipetting push_button, (Fig. aD), Determine the average aspirated volume. The average volume should be within the permissi_ble range given in the table. If the volume exceeds the values stated, the recalibration pro_ cedure should be repeated"

6- MAINTENANCE

Cones should be kept clean using ethylalcohol.

7- PIPETTE KIT

The pipettes are delivered in the kits including:

- · Pipette
- · Instruction manual
- · Calibration key
- · Pipette holder
- · Identification labels
- .The attachment of the holder is shown in Fig. 5

8- SPARE PARTS

- The spare parts as shown, (Fig.1,4):
- 1. Pushbutton
- 2. Ejector pushbutton
- 3. Calibration knob
- 4. Ejector
- 5. Piston's assembly
- 6. Calibration key

Can be ordered from **SLAMED** representative - type of houlds the pipette and name of the parts for this pipette be specified.

Warning: The replacement of the plunger dureerequires conducting of calibration proc according to section 5.

Before returning a pipette to us for service, please ensure that the pipette is completely free of any rchemical, biological or radioactive conta-mination o ewith the information on the kind of liquids that hav been measured



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- MULTI MATE PIPETTES 8 12 CHANNEL

Warranty Certificate

The enclosed instrument incorporates an advanced pipetting mechanism built from robust components. The strictly defined production procedures and stringent quality control guarantee long term reliability of your pipette. This instrument carries a 3 year warcanty against any defects in material- and workmanship. The warranty shall be honored by your representative given that the pipette was used in accordance with the enclosed instructions and has been properly maintained as described in pipette manual. The warranty does not cover damage resulting from physical shock, extensive exposure to highly aggressive liquids or non-conventional pipette cleaning or non-conventional recalibrati-on. This warranty does not cover: the teflon seal, o-ring and the shaft. These parts naturally wear during normal use, and it is recormended that these parts are replaced during scheduled naintenance.

Servicing of your pipette

In case of any questions or problems arising from the usage of your equipment contact your representative. Any pipette returned to your representative should be decontaminated and accompanied by a complete Claims Form (contact your representative for a copy). On the Claims Form make sure to describe the conditions under which your pipette was used and the nature of the malfunction. Complete information is necessary so we may resolve any problems in the fastest and most effective manner.

ATTENTION

The Pipette construction allows to rotate the multichannel module and to eject the tips through 360°, therefore, the most convenient position may be selected to fill the microplates. It is recommended to turn the module clockwise.

BITTE BEACHTEN SIE

Die Konstruktion der Pipette erlaubt eine Drehung des Mehrkanalmoduls und den sicheren Spitzenabwurf im Bereich von 360°. Dies ermbglicht eine individuelle Position zum Befllen von Mikrotiterplatten. Es wird empfohlen, das Modul im Uhrzesgersinn zu drehen.

ATTENTION

La construction de la pipette permet de changer 'emplacement du module multicanal et d'ejecter des embouts dans le champ de 360°. ce qui donne la possibil ite de choisir la meilleure position pour remplir les microplaques. Il est recommand6 de tourner le module dans le sens des aiguilles d'une montre.

OUALITY CONTROL CERTIFICATE

ISO 9001 The enclosed liquid handling instrument has been manufactured in a facility that employs a registered and certified quality management system. This system ensures that the development and production of this product has been strictly controlled and that it meets the highest quality standards. Each instrument passes stringent validation and Control Procedures in accordance with EN ISO 8655.

Model : Serial :	MT-200 851870002	Volume (µl) :	20.000	Volume (µl) :	200.00
cat.No, :	14.2.2	Accuracy (%)	-0.570	Accuracy (%)	0.150
Date :	19.05.08	Precision (%)	0.4L6	Precision (%)	0.572
Tested by :	C16			(),	
Status:		Pa	ssed	Passed	

Passed

Passed

Calibrated and tested using the gravimetric method with distilled water: Condition of measurements:

Basis of adjustment: Ex; Reference temperature: 20°C; Relative air humidity: 50%; Barometric pressure: 101kPa



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