Millipore®

MilliSentials™
Aliquoting Pipette Controller

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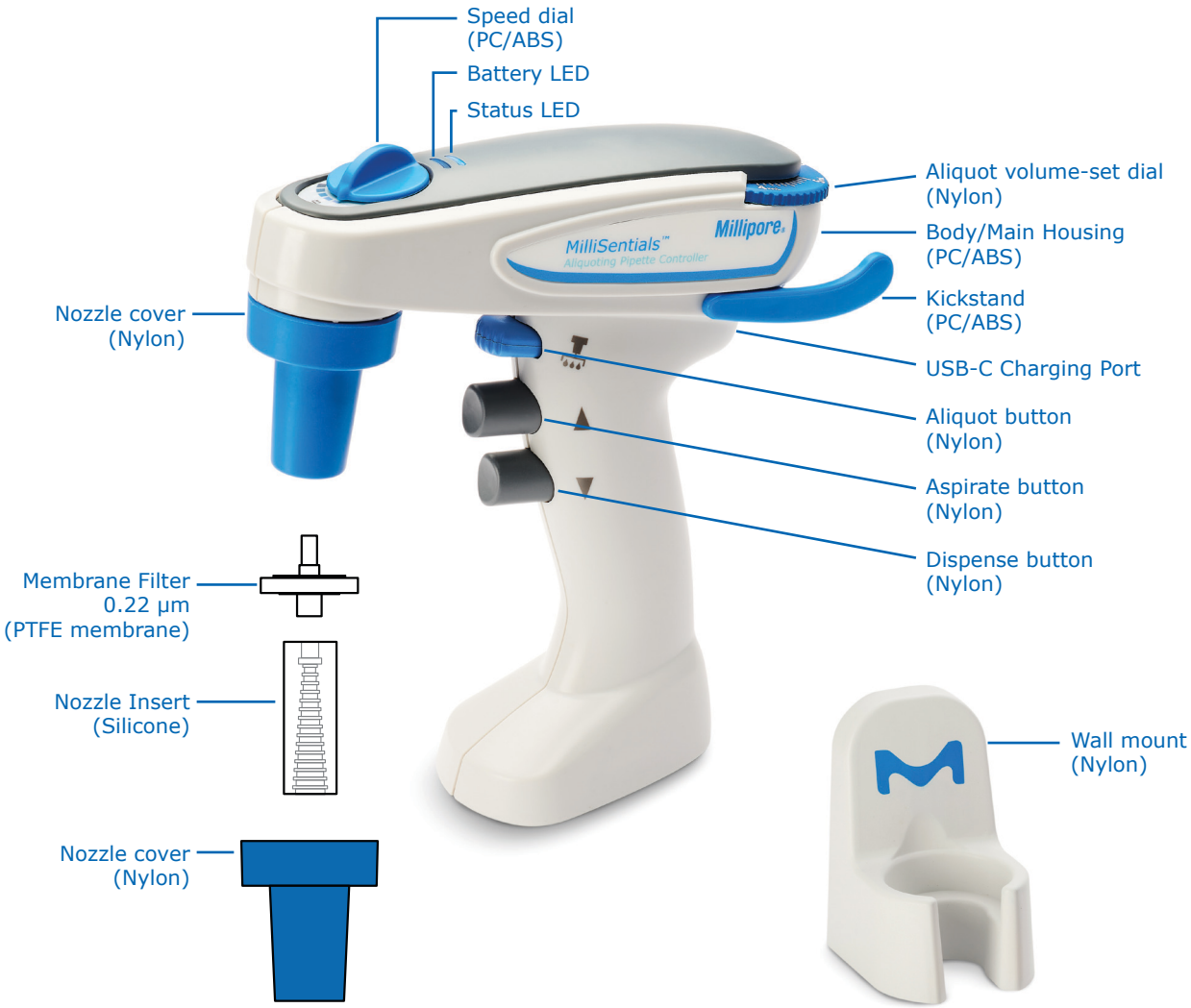
Getting Started



Package Contents

- MilliSentials™ Aliquoting Pipette Controller
- Power supply (with universal outlet adapters)
- USB-C charging cord
- Quick Start Guide/Safety Sheet
- Wall mount
- Kickstand
- 1 Replacement membrane filter
- Certificate of Calibration

Terms and Definitions

Aliquot (noun) A portion of a total amount of a solution or suspension; (verb) To separate a volume of solution or suspension into aliquots.

Aspirate To fill with liquid.

Dispense To eject liquid.

Serological pipette Disposable glass or plastic tube with volume graduations used to aspirate and dispense liquid. Sometimes spelled "pipet".

Accuracy How close the measured volume is to the target volume.

$$\%\ Accuracy = \frac{(Target\ Volume - Measured\ Volume)}{Target\ Volume}\ x100$$

Precision (CV%) How close measurements (aliquots) are to each other; independent of the target volume.

$$Coefficient\ of\ Variation\ (\%) = \frac{Standard\ Deviation}{Mean}\ x100$$

Performance Another way of referring to the unit's overall accuracy and precision.

Recharging the Battery

1. Attach the proper outlet adapter to the power supply pack and insert into wall outlet.
2. Attach the wide end of the USB-C charging cord to the power supply pack.
3. Plug the USB-C end of the charging cord into the charging port of the MilliSentials™ Aliquoting Pipette Controller (under the aliquot volume dial). MilliSentials™ Aliquoting Pipette Controller can still be used when plugged into charger.

Charge time	3 hours (from 0% to 100%)
Battery life	Approximately 2000 dispenses with a 25-mL pipette, dependent on frequency and intensity of use
Recharging Conditions	Same as Operating Conditions

WARNING Improper use of the instrument (e.g. short-circuit, mechanical damage, overheating, etc.) may cause the battery to explode.

Note: The MilliSentials™ Aliquoting Pipette Controller can still be used when connected to the charger. Precision and accuracy can be affected during charging.

Kickstand Installation

MilliSentials Aliquoting Pipette Controller can be used with the removable kickstand (included in box) even with a serological pipet inserted. The kickstand attaches securely in one orientation only. Be sure to attach so that the curved ends point up.

1. Snap the pins on the kickstand into the round dimples on the sides of the MilliSentials Aliquoting Pipette Controller body.
2. To remove, gently pinch the curved ends and pull kickstand away from body.

Wall Mount Installation

The wall mount provides a convenient storage option that minimizes damage from accidental drops and chemical spills. The MilliSentials™ Aliquoting Pipette Controller may be stored in the wall mount with serological pipettes up to 100 mL attached. The wall mount will firmly adhere to any smooth, clean, non-painted surface, such as the inside of a hood.

The wall mount and two 3M® Command™ Brand strips are included. To install:

1. Clean the wall mount and desired wall area with alcohol.
2. Pull the strips apart at the perforation to separate into two strips.
3. Remove one side of the liner and stick both Command strips to the back of the wall mount. Press firmly.
4. Remove the remaining liners. Firmly press the wall mount onto the desired wall area for about 30 seconds.
5. Wait 30 minutes for adhesive to take hold before storing your MilliSentials™ Aliquoting Pipette Controller in the wall mount.

Accessories for this product are listed in Product Ordering on page 9.

LED Indicators

Unit on battery power

LED	LED color	Status
Battery	OFF	Battery normal
	RED blink (slow)	Battery low
	RED blink (fast)	Battery critical
Status	BLUE	Ready
	OFF	Unit busy/asleep
	RED blink (fast)	Error

Unit plugged in

LED	LED color	Status
Battery	RED solid	Charging
	GREEN	Fully charged; remove charger
Status	BLUE	Ready
	OFF	Unit busy/asleep
	RED blink (fast)	Error

Note: If LED does not light up during charging, see Troubleshooting on page 10.

Note: The LEDs will change when the unit is in calibration mode. Refer to Calibration on page 8 for further infomation about this procedure.

Operation and Use

Quick Calibration

For best performance we recommend performing a quick calibration:

1. Set aliquot dial to BELOW 0.0, turn device upside-down, and hold aliquot button for 5 seconds. Three tones will sound and the status LED will be quickly blinking PURPLE. The battery LED will remain solid PURPLE.
2. Release the button, turn device upright and hold the aliquot button again for 5 seconds, until both LEDs blink GREEN.
3. Release button; both LEDs will blink GREEN 5 times.

Shipping Mode

The MilliSentials™ Aliquoting Pipette Controller is shipped from the factory in "shipping mode" for safety and to preserve battery life. Before use, wake it out of shipping mode by pressing the aliquot button with the unit in the upright position.

To put the MilliSentials™ Aliquoting Pipette Controller back into shipping mode, set the volume dial above 5mL, turn the unit completely upside down, and press and hold the aliquot button of at least 5 seconds. You will hear 3 "power down" tones. Shipping mode should only be used when shipping or transporting the MilliSentials™ Aliquoting Pipette Controller.

Sleep Mode

The MilliSentials™ Aliquoting Pipette Controller automatically goes into "sleep mode" to preserve battery life after being motionless for approximately 3 minutes. The Status LED will turn off while the unit is in sleep mode. Once the MilliSentials™ Aliquoting Pipette Controller is picked up or moved, it will automatically wake itself up and the Status LED will remain BLUE.

Pipetting Speed Control

While using conventional pipetting method, the speed that the MilliSentials™ Aliquoting Pipette Controller aspirates and dispenses liquid is controlled by the touch-sensitive aspirate and dispense buttons. Pushing the buttons with greater force increases the speed that liquid enters or exits the pipette.

Conventional Pipetting

1. **Attach serological pipette.** Hold the pipette as near to its upper end as possible and carefully insert it into the nozzle until it fits tightly. MilliSentials™ Aliquoting Pipette Controller is compatible with all brands of serological pipettes from 1-100 mL, glass or plastic.

   WARNING Using excessive force when inserting pipettes risks breakage and injury.

2. **Aspirate liquid.** Immerse the pipette's tip into the liquid. Press and hold the aspirate button and fill the pipette so that the meniscus is above the volume graduation desired. Then press the dispense button until bottom of meniscus is at the desired volume graduation.

   ATTENTION Do not fill the pipette over the maximum volume. Severe damage can occur if any liquid enters the MilliSentials™ Aliquoting Pipette Controller. Decrease pressure on aspirate button when near maximum volume level, to slow down aspiration.

3. **Dispense liquid.** Carefully position the tip of the full pipette over the receiving vessel. Press and hold the dispense button until meniscus reaches desired volume graduation or when pipette is completely empty.

   ATTENTION Never lay the MilliSentials™ Aliquoting Pipette controller on the bench or invert pipette on the bench when filled with liquid, as this will damage the device. Instead, use the kickstand.

Conventional Pipetting Accuracy and Precision

Accuracy and precision (CV%) is determined by the performance and specifications of the serological pipette chosen, as well as the user's ability to consistently visually estimate and control the liquid meniscus.

Note: The motor will activate at seemingly random times when pressing aspirate or dispense buttons, or when not in use. This is normal. For more information see Intelligent Measuring System on page 6.

Aliquot Mode

1. **Attach serological pipette**.
2. **Set the aliquot volume-set dial (A).** Turn the dial so that the arrow points to the volume you wish to aliquot.
3. **Set the aliquot speed on the blue aliquot speed dial (B).** Turn the dial so that the arrow points to the desired speed. 1 is the slowest and 7 is the fastest. 1 dispenses with the lowest force and 7 dispenses with the highest force.
4. **Aspirate liquid.** Immerse the pipette tip into the liquid. Press and hold the aspirate button and fill the pipette. Be sure to aspirate enough liquid to dispense as many aliquots as you will need. For example, if you need to dispense 10 aliquots of 2 mL, you will need to aspirate at least 20 mL of liquid.
5. **Dispense aliquots (C).** Carefully position the tip of the full pipette over the receiving vessel. Press and hold the aliquot button until the staus LED blinks GREEN and motor turns on. You will feel and hear the motor. Repeat for each aliquot.

   Note: If you release the aliquot button too soon, i.e. before the full aliquot volume has dispensed, the Status LED will blink RED and you will hear an "alert" sound. This indicates the aliquot did not dispense fully and/or properly, and will not be accurate. Repeat the aliquot. Follow the Aliquot Mode steps shown above for best results.

   Note: Discard the first aliquot for optimal precision.

Accuracy and Precision

The MilliSentials™ Aliquoting Pipette controller is calibrated to perform within the following specifications under controlled environmental conditions in an ISO 17025 certified laboratory.

Speed	Volume	Accuracy	Precision (CV%)
Speed 3	0.5 mL*	5%	4%
Speed 7	0.5 mL*	6%	3%
Speed 3	5.0 mL**	2%	1%
Speed 7	5.0 mL**	3%	1%

*dispensed with a 5-mL serological pipette (any brand)
**dispensed with a 25-mL serological pipette (any brand)

Actual results may be affected by:

- Varying environmental conditions (temperature, humidity, pressure)
- Use with different types of liquids
- Pipetting technique
- Use smallest volume serological pipette possible for the application

Intelligent Measuring System

The MilliSentials™ Aliquoting Pipette Controller aliquot mode utilizes a state-of-the art measuring system that incorporates information from multiple sensors to give real-time feedback and parameter adjustment for different variables that affect the accuracy and precision when in aliquot mode.

- **Varying environmental conditions.** Temperature, humidity and pressure all have significant effects on the performance of liquid handling devices. Our Intelligent Measuring System can sense changes in ambient conditions and compensate as necessary to ensure accurate aliquoting.
- **Varying pipette angle.** The pipette angle decreases performance of liquid handling devices due to changes in the meniscus shape and the chance of dripping. The MilliSentials™ Aliquoting Pipette Controller adjusts the dispense aliquots for varying pipette angles and ensures ergonomic handling. The Intelligent Measuring System is especially useful in a hood, where space and maneuverability is limited. Thus, performance of the MilliSentials™ Aliquoting Pipette Controller will not be affected whether the pipette is held completely vertical or tilted.
- **Varying brands/sizes of serological pipettes.** Every brand of pipette has different sizes and geometries. These geometric differences contribute to changes in the physical characteristics of the system. The Intelligent Measuring System can sense the effect of these differences and automatically compensates to optimize aliquoting performance.
- **Dispensing liquids of varied densities.** Using MilliSentials™ Aliquoting Pipette Controller with different liquids more or less dense than water, will impact the accuracy of the dispensed aliquots. The Intelligent Measuring System will maintain the precision.

Specifications

Dimensions	7.2 in. x 7.0 in. x 2.2 in. (18.3 cm x 17.8 cm x 5.6 cm)
Weight	350 g
Volume Capacity	1 to 100 mL serological pipettes
Pipette Compatibility	Compatible with glass or plastic serological pipettes
Operating Conditions	
Temperature	15 °C to 35 °C (59 °F to 95 °F)
Relative Humidity	22%–85%, non-condensing, indoor use only
Power Supply	
Input Voltage	100–240 V ~ (50/60 Hz), 1 A
Hand-held Instrument	
Battery Type	Lithium-Polymer
Voltage	5 V ⎓, 1 A
Capacity	1000 mAh
Charging Time	Approximately 3 hours (from 0 to 100%)
Number of Dispenses	~2000 dispenses with a 25mL pipette

Cleaning and Maintenance

The MilliSentials™ Aliquoting Pipette Controller requires minimal maintenance, when used as intended. We recommend performing routine maintenance and calibration verification at least once a year.

Cleaning

- **Chemical** Occasionally wipe outer housing of the MilliSentials™ Aliquoting Pipette Controller and the nozzle cover with a damp cloth of soapy water or diluted alcohol solutions (e.g. 70% isopropanol).

  Note: Check calibration of the instrument, as accuracy and CV maybe be affected by long exposures to solvents.

  WARNING: ALWAYS use protective gloves and eye protection.

- **UV Sanitizing** Exposure to UV may cause discoloration. Do not UV for over 24 hours total.
- **Autoclaving** Only the nozzle cover, nozzle insert and membrane filter can be detached from the unit and separately autoclaved at 121°C (250°F); 30 psi (2 bar absolute) with a holding time of at least 15 minutes. **NEVER AUTOCLAVE** the MilliSentials™ Aliquoting Pipette Controller.

Replacing the Membrane Filter

1. Unscrew the blue nozzle cover counterclockwise.
2. Remove the membrane filter.
3. Place new membrane filter with the thicker end facing downwards into the silicone nozzle insert and thinner end into MilliSentials™ Aliquoting Pipette Controller. The thinner opening of the silicone insert should contact the filter.
4. Screw the nozzle cover assembly back onto the MilliSentials™ Aliquoting Pipette Controller.

Replacing the Nozzle Insert

1. Unscrew the blue nozzle cover counterclockwise.
2. Remove the membrane filter and silicone nozzle insert from nozzle cover.
3. Insert new silicone nozzle insert into nozzle cover. Place membrane filter with the thicker end inserted into the silicone nozzle insert and thinner end into MilliSentials™ Aliquoting Pipette Controller.
4. Screw the nozzle cover assembly back into the MilliSentials™ Aliquoting Pipette Controller.

Calibration

The MilliSentials™ Aliquoting Pipette Controller's aliquot mode performance is calibrated to aliquot the volume set on the aliquot volume-set dial to the factory specs (see Specifications) under the following conditions:

- Temperature 20 °C - 22 °C (68 °F - 71.6 °F)
- Relative humidity 45% - 75%
- Using ISO 3696 Grade 3 purified water

Calibration Verification

We recommend performing calibration verification at least once per year or whenever conditions and equipment change. See the product web page for calibration directions. If you have questions about the process or results, contact Tech Service at SigmaAldrich.com/techservice.

Methods of Accuracy Verification

- **Gravimetric** Using a digital scale and water, determine the weight (in grams) of the dispensed aliquot. Instructions for gravimetric verification are available for download from the MilliSentials™ Aliquoting Pipette Controller web page.
- **Colorimetric** Using a spectrophotometer to measure the absorbance value of diluted dye in a solvent of controlled volume. Absorbance value then converted into a volume (µL).
- **Visual** Using an approved graduated cylinder or the volume graduations on the serological pipette as a reference of how much liquid is being dispensed. To compensate for errors in dispensed aliquots, adjust the aliquot volume-set dial up or down.

  NOTE: Most serological pipettes have ±2% accuracy of their volume graduations, so this is the least accurate way of verification.

User Calibration

If accuracy readings are determined to be outside of acceptable levels, the MilliSentials™ Aliquoting Pipette Controller may be re-calibrated by the end user. Instructions for re-calibration are available on the MilliSentials™ Aliquoting Pipette Controller product page at SigmaAldrich.com or by contacting SigmaAldrich.com/techservice.

Factory Reset

Instructions to are available on the MilliSentials™ Aliquoting Pipette Controller product page at SigmaAldrich.com or by contacting SigmaAldrich.com/techservice.

Disposal

Batteries and electronic devices must be disposed of separately from household trash (mixed municipal waste) at the end of their service life.

End of Life Instructions WEEE Directive System Dismantling and Product Recycling

In accordance with European Union directive on the management of Waste Electrical and Electronic Equipment (WEEE) and in alignment with many other global environmental initiatives, this product MUST NOT BE DISPOSED OF IN UNSORTED MUNICIPAL WASTE at the end of its life. The system, whether in part or whole, must be taken to a collection and recycling center. For further information on how and where to recycle your product and/or its associated components such as Lithium Ion Batteries in the European Union, please visit SigmaAldrich.com/weee.

Battery Precautions

Battery should not be accessed or replaced by the user unless directed to do so through SigmaAldrich.com/techservice.

- Battery and other components should only be replaced with genuine MilliSentials™ Aliquoting Pipette Controller parts.
- Do not use instrument in a humid and/or corrosive environment.
- Do not disassemble, pierce or modify the battery or subject them to unnecessary shocks that would risk damaging them.
- Do not leave near or in direct contact with a heat source (risk of leakage and/or explosion which may cause injuries and/or damage).
- In the event of leakage and direct contact with the fluid, rinse the exposed area with plenty of water and seek medical advice immediately.
- Do not put the battery in your mouth. If swallowed, seek medical advice or contact the nearest poison control center immediately.
- Do not short circuit battery to discharge it.
- Risk of explosion and fire due to overheated rechargeable batteries. Do not heat to over 80 °C and do not throw into fire.

Product Ordering

Purchase online at SigmaAldrich.com/products.

Description	Catalogue No.
MilliSentials™ Aliquoting Pipette Controller Includes power supply, wall mount, 1 spare 0.22 µm membrane filter (non-sterile)	MISEPTC0N
Replacement membrane filter, 5 pack	MISEMEMFR
Replacement silicone nozzle insert, 2 pack	MISESINZI
Replacement nozzle	MISEN0ZLE

Symbols Chart

Symbol	Definition
	Caution, Warning
	Catalogue Number
	Serial Number
	Batch code
	CE conformity marking
	Manufacturer
	European Union directive on the management of Waste Electrical and Electronic Equipment (WEEE)

Troubleshooting

Problem	Possible Cause	Suggested Fix
Slow aspiration	Membrane filter clogged	Replace membrane filter
	Not enough force on aspirate button	Press aspirate button with more force to increase aspirate speed
	Cotton from a serological pipette went into the nozzle	Remove the cotton from the nozzle and use a new serological pipette
	Cotton from a serological pipette is wet	Do not overfill serological pipette or tip pipette while lifting the device from the kickstand
Aspirating air bubbles	Pipette tip not fully immersed in liquid while aspirating	Make sure pipette tip is fully immersed in liquid throughout aspiration
	Pipette not fully inserted into nozzle insert	Gently insert pipette further into silicone nozzle
	Aspirating too fast for solution (e.g. detergents)	Lightly press the aspirate button to slow aspirate speed
Pipette drips liquid	Pipette not fully inserted into nozzle insert	Gently insert pipette further into silicone nozzle
	Crack in serological pipette	Try a new pipette
	Membrane filter clogged	Replace membrane filter
	Membrane filter not properly positioned or upside down	Insert filter properly
	Nozzle insert worn or damaged	Replace nozzle insert
	Valve not shutting properly	Send MilliSentials™ Aliquoting Pipette Controller in for repair service
	Serological pipette filled beyond the max volume or device not properly handled when using the Kickstand	Place the device gently on the Kickstand. Do not fill over the max volume for serological pipette
Pipette does not stay in device	Nozzle insert worn or damaged	Replace nozzle insert
Out-of-Calibration	Using different equipment, different density liquid, varying environmental conditions	Adjust the aliquot volume-set dial up or down depending on results of calibration verification (see Calibration Verification on page 8)
	Membrane filter clogged	Replace membrane filter
	Device was not calibrated when removed from box	Refer to Operation and Use on page 5 for instructions on calibrating the device
Motor makes alert sound when dispensing aliquots	Not holding down aliquot button long enough	HOLD aliquot button until Status LED blinks GREEN and motor starts (you will hear and feel motor)
LED blinks or does not light up when connected to charger	Instrument defective	Contact Tech Service at SigmaAldrich.com/techservice

Problem	Possible Cause	Suggested Fix
Battery does not hold charge	Power cord not inserted fully	Check power cord connection Replace power cord
	Battery defective or drained	Contact Tech Service at SigmaAldrich.com/techservice
Instrument does not turn on after charging	Instrument defective	Contact Tech Service at SigmaAldrich.com/techservice
	Internal software malfunction	Contact Tech Service at SigmaAldrich.com/techservice
Device falls over when leaned back on kickstand	Kickstand not properly attached	Refer to Kickstand Installation on page 4 to properly attach Kickstand to device
Splash back seen when dispensing aliquots or during conventional pipetting	Serological pipette is held far away from receiving vessel	Move closer to receiving vessel or turn down the speed dial if aliquoting

Notice

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Contact Information

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