



1-CONTHR-3

PicoPipet Controller

# Instruction Manual



# Important Information



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This product is authorized for laboratory research use only, not medical product. The product has not been qualified or found safe and effective for any human or animal diagnostic or therapeutic application. Uses for other than the intended use may be a violation of applicable law.

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The PicoPipet is an electronic ultra-small-pipetting device that has an electroosmotic pump in its pipette part. The special pump can easily control microfluidic flows without pulsation. This manual provides instructions for proper setup and operation of the 1-CONTHR-3 PicoPipet Controller and its components.

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# 1 Checking the Package

- (1) x 1-CONTHR-3 PicoPipet controller



- **Accessories**

- (1) x PicoPipet cable



- (1) x Power adapter and power cord



- (1) x Instruction Manual (this manual)



## 2 Related Products

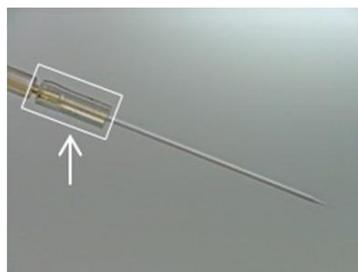
### ■ PicoPipet pipette part



It is connected to the PicoPipet controller through the PicoPipet cable. This pipette has a special electroosmotic pump that makes it possible to precisely control microfluidic flows without pulsation.

Cat #	Description
1-PPD-SP	PicoPipet pipette part

### ■ Silicone tubing



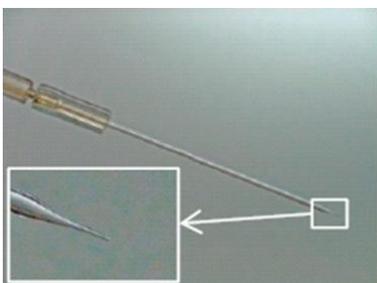
It is for the connection between the PicoPipet pipette part and a glass micropipette. The tubing needs to be cut into a 1.5-cm piece before use. The inner diameter is 0.8 mm and the outer diameter is 4 mm.

Cat #	Description
1-ST-D	Silicone tubing, 1.5 m

### ■ Glass micropipettes

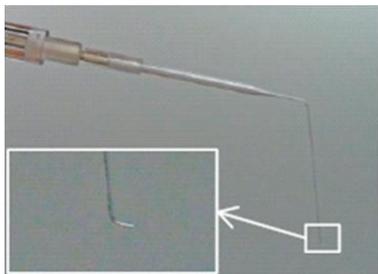
The glass micropipette is connected to the PicoPipet pipette part through the silicone tube.

#### Straight shape for dishes/microscope slides



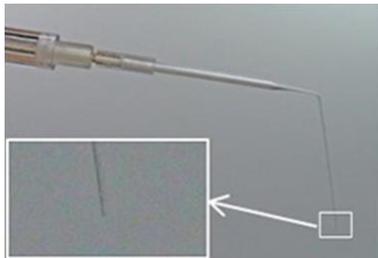
Cat #	Description
1-GS15-10	10 pcs glass micropipettes, straight shape, tip ID 15 um
1-GT30-10	10 pcs glass micropipettes, straight shape, tip ID 30 um
1-GT50-10	10 pcs glass micropipettes, straight shape, tip ID 50 um
1-GT75-10	10 pcs glass micropipettes, straight shape, tip ID 75 um

**S shape for multiple-well plates/PCR tubes**



Cat #	Description
1-GT30S-5	5 pcs glass micropipettes, S shape, tip ID 30 um
1-GT50S-5	5 pcs glass micropipettes, S shape, tip ID 50 um
1-GT75S-5	5 pcs glass micropipettes, S shape, tip ID 75 um

**L shape for microdevices or micro liquid applying/spotting**



Cat #	Description
1-GS15L-10	10 pcs glass micropipettes, L shape, tip ID 15 um
1-GT30L-10	10 pcs glass micropipettes, L shape, tip ID 30 um
1-GT50L-10	10 pcs glass micropipettes, L shape, tip ID 50 um
1-GT75L-10	10 pcs glass micropipettes, L shape, tip ID 75 um

**PicoPipet holders**



The PicoPipet holder is for holding the pipette part and being attached to a manipulator. The light weight helps precise manipulations by a manipulator. The position of the pipette part can be flexible because the angle of holding the pipette part can be changed freely. There are three different holder lengths; 40 mm, 80 mm, and 150 mm. The 15 mm version has a clamp for fixing the holder to a manipulator.

Cat #	Description
1-PPH4	PicoPipet holder 40 mm
1-PPH8	PicoPipet holder 80 mm
1-PPH415-1	PicoPipet holder 150 mm with clamp

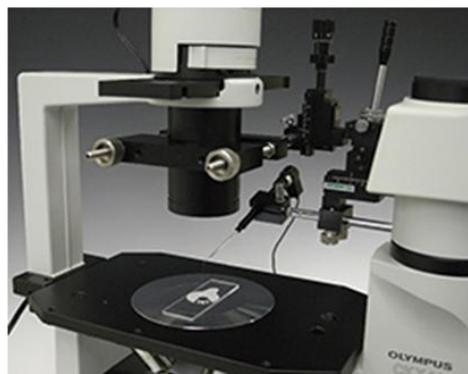
## ■ Joystick manipulator



The joystick manipulator is a manual control micromanipulator that has a joystick bar to intuitively operate the PicoPipet pipette part at XY axis. The brass bracket part enables the manipulator shape to be flexibly changed according to the microscope environment.

Cat #	Description
1-XYZJ-2	Joystick manipulator

## ■ Joystick manipulator with lens/condenser mounting clamp



This includes a clamp that can fix the joystick manipulator on the lens/condenser of user's microscope like the picture below. The available outer diameter of the lens/condenser is 40-70 mm. Compared with the magnetic stand kit (the next item), it saves space and allows easy setting up.

Cat #	Description
1-VADB-2	Joystick manipulator with lens/condenser mounting clamp

■ Joystick manipulator with magnetic stand kit



This includes poles, a magnetic stand and an iron mat that are for the use of the joystick manipulator with user's microscope. Compared with the lens/condenser mounting clamp, the manipulator can be positioned flexibly. A place for the iron mat (250 mm x 200 mm) is needed next to the microscope.

Cat #	Description
1-VADB-2	Joystick manipulator with lens/condenser mounting clamp

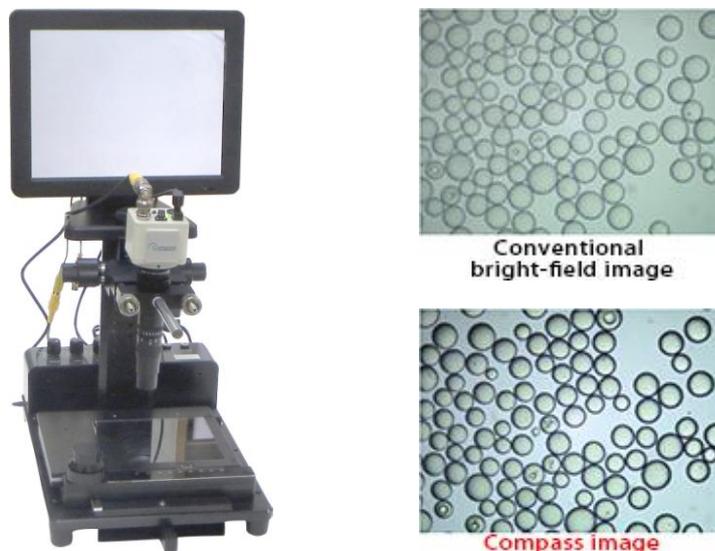
■ Zrobo z axis automatic control device



Zrobo is a device that controls z-axis movements of the PicoPipet pipette part automatically. A manipulator can be attached to the horizontal bar of the Z robo. 4 different heights can be saved and recalled by touching the buttons on the control panel. During the use of the PicoPipet, the pipette part need to be moved to fixed heights repeatedly. The Zrobo is used to significantly reduce this troublesome manual-z-axis work. The customers who already have the MPP-200A/200B/100 can add the Zrobo to their system and combine the Zrobo with it.

Cat #	Description
1-TKRK-B1	Zrobo z axis automatic control device

## ■ Compass video microscope



The Compass is a video microscope that works by a unique pattern-projection method. The images of transmissive objects like cells can be high-contrast and 3D-shape views under the simple optical system. With the PicoPipet, you can conveniently transfer a cell from one container to another while monitoring the process on the screen. The total magnification is 52x-425x (similar to microscope objective 20x).

Cat #	Description
3-OMN-N1	Compass video microscope

## ■ Compass Z Zrobo-mounted video microscope



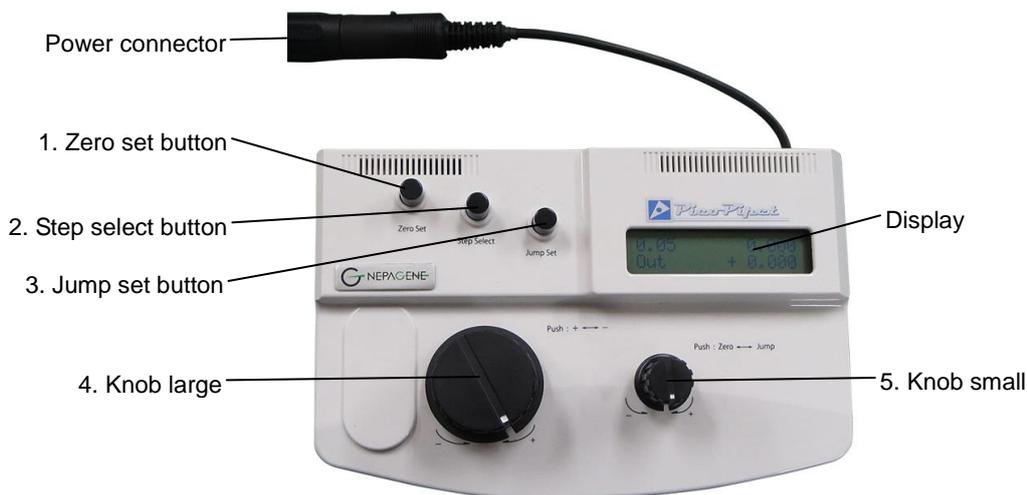
The Zrobo motor that enables automatic z-axis movements is mounted on the Compass video microscope. The height of the PicoPipet pipette part can be automatically changed to the intended height by touching the button on the control panel. (If you have the Compass, it can be upgraded to the Compass Z.)

Cat #	Description
3-OMN-Z1	Compass Z Zrobo-mounted video microscope



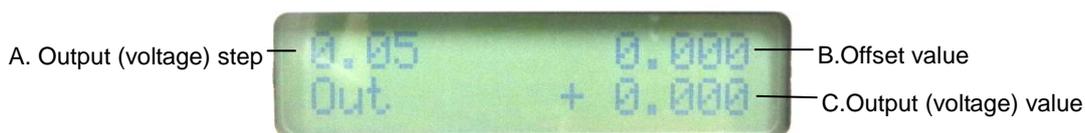
# 3 Part Names

## ■ PicoPipet Controller Top



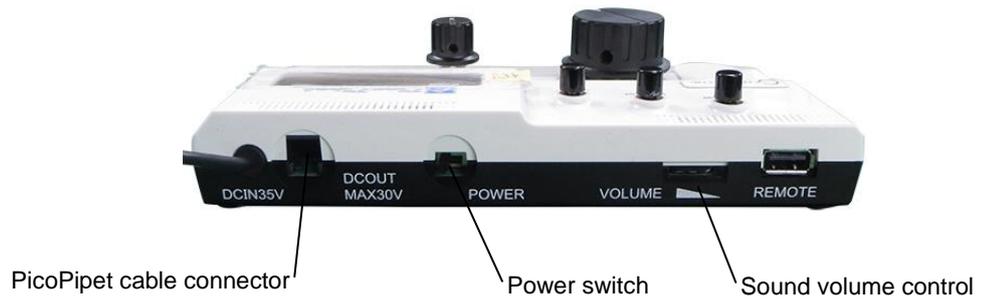
1. Zero set button	The current Output (voltage) can be set as a new zero value and added to the Offset value.
2. Step select button	The Output (voltage) increment of Knob large can be changed. (0.05→0.01→0.001)
3. Jump set button	The displayed Output (voltage) value can be saved as Jump value.
4. Knob large	The Output (voltage) value can be changed by turning the knob. *Fine adjustment (0.05/0.01/0.001) +/- Output (voltage) can be reversed by pressing the knob.
5. Knob small	The Output (voltage) value can be changed by turning the knob. *Coarse adjustment (0.25) The Output (voltage) value can be changed to the <b>set</b> zero value by pressing the knob. The Output (voltage) value can be changed to Jump value by pressing the knob when the Output (voltage) value is zero.

## Display



A. Output (voltage) step	The current Output (voltage) increment. The increment can be selected from 0.05, 0.01 and 0.001
B.Offset value	The distance from the default zero value of Output (voltage).
C.Output (voltage) value	The current Output (voltage) value that indicates a distance from the <b>set</b> zero value of Output (voltage).

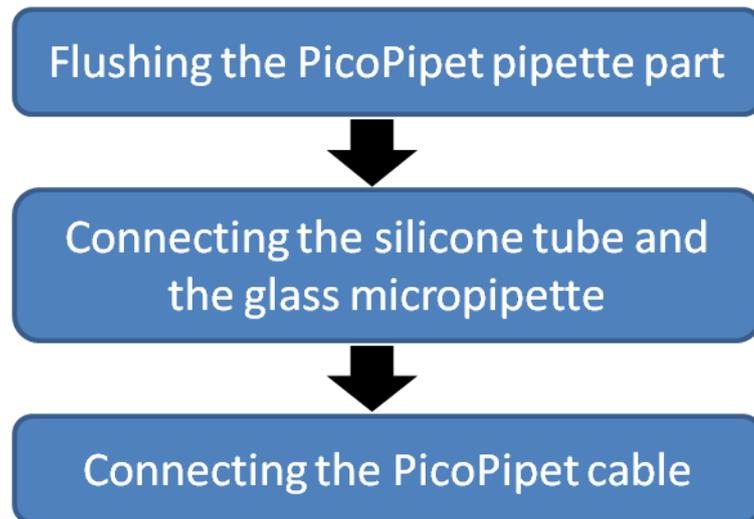
■ PicoPipet Controller Rear



# 4 Preparation of PicoPipet pipette part

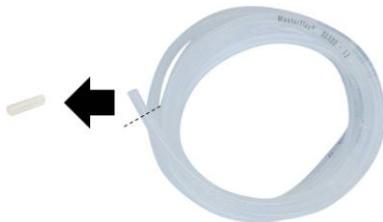
## 4.1 Overview

The PicoPipet pipette part must be connected to the PicoPipet controller to do the experiment. Before starting the experiment, please follow the steps below:



## 4.2 Preparing the silicone tube

- 1 Prepare a 1.5 cm-long piece of the 1-ST-D silicone tubing by cutting out the tubing.

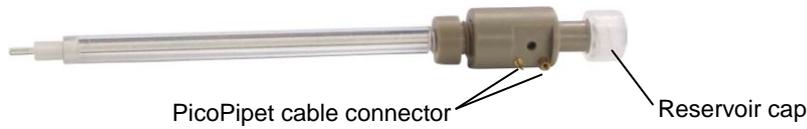


## 4.3 Flushing the PicoPipet pipette part

The residual water and air inside the pipette part need to be flushed out with fresh ultrapure water using a luer lock syringe. The special pump part inside the pipette needs to be filled with fresh ultrapure water.

- 1 Prepare the included luer lock syringe or a commercial luer lock syringe (e.g. BD 309657 3mL syringe, Terumo SS-02LZ 2.5mL syringe) and fill the syringe with ultrapure water.

- 2 Take out the pipette part from the pipette box.



- 3 Remove the reservoir cap.

- 4 Connect the syringe to the pipette part.



- 5 Push the plunger to push out the residual water and air completely in the pipette part and fill the pipette part with fresh ultrapure water. Until air bubbles in the pipette disappear thoroughly, keep pushing the plunger.



You may see water coming from the PicoPipet cable connector as well as the tip of the pipette, but it is not a problem. Leave it until pushing out the residual water and air in the pipette.



- 6 Connect the cut silicone tube to the tip of the pipette.



- 7 Push the plunger to push out water and air until they come out.



- 8 Connect the glass micropipette to the silicone tube.



- 9 Push the plunger to push out water and air until they come out.



- 10 Remove the syringe from the pipette.

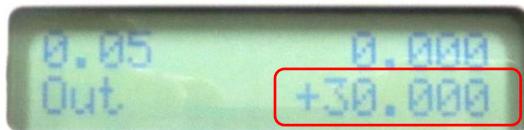


## 4.4 Connecting the PicoPipet cable

- 1 Connect the PicoPipet cable to the pipette part and the controller.



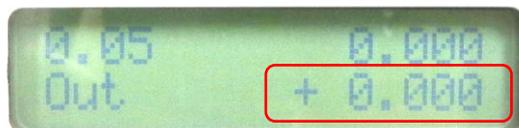
- 2 Power on the PicoPipet controller.
- 3 Turn the Knob small clockwise to increase Output to +30.



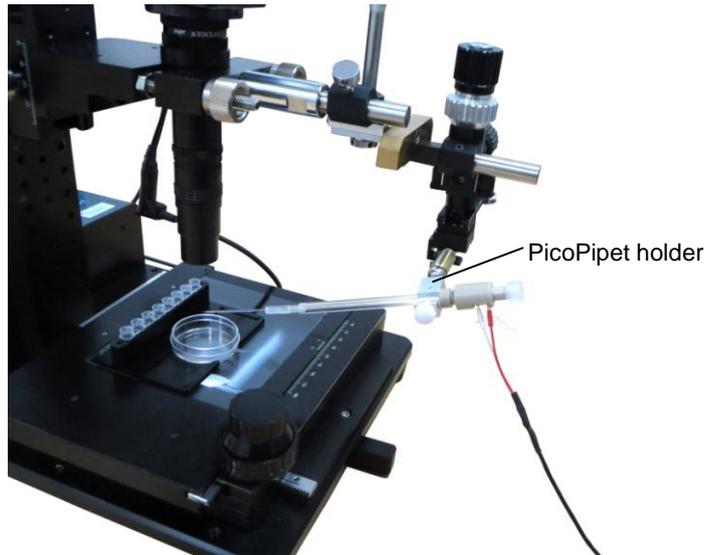
Confirm water coming from the tip of the glass micropipette.



- 4 Press the Knob small clockwise to change Output to 0.



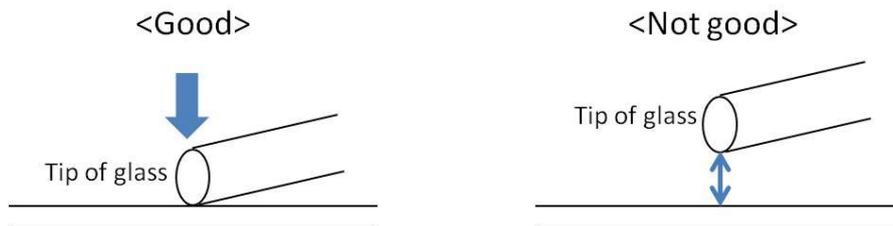
- 5 Set the pipette on the PicoPipet holder.



- 6 Adjust the position of the tip of the glass micropipette to focus the microscope.

**[NOTE]**

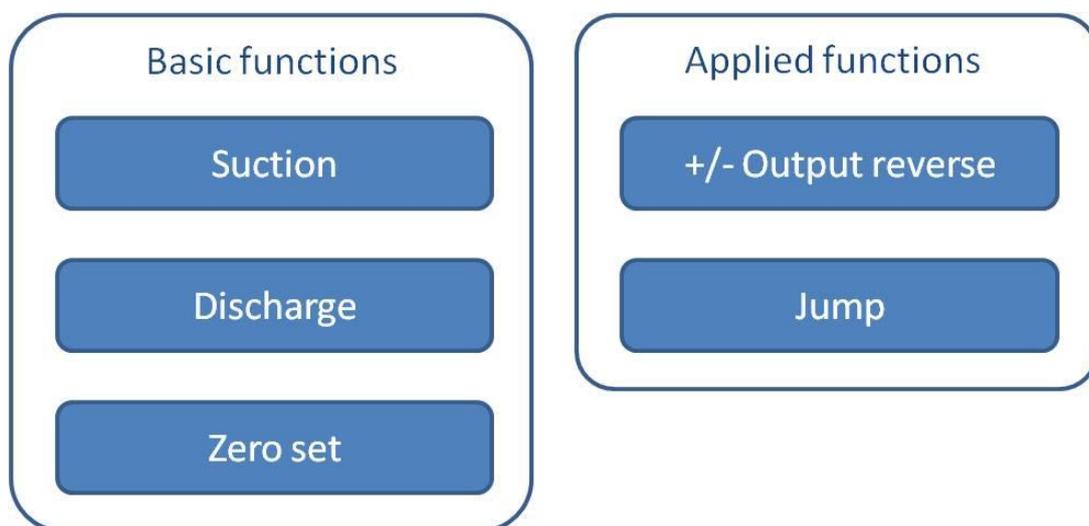
- Lower the position of the tip of the glass micropipette enough to attach to the bottom.





# 5 Operating Instructions

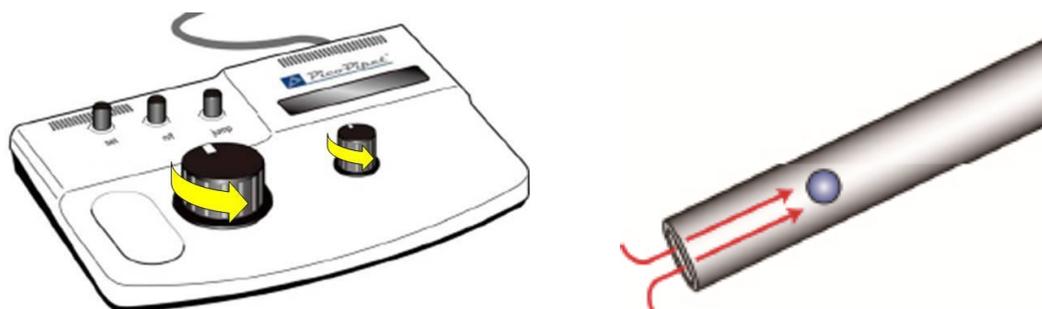
## 5.1 Overview



**[NOTE]**

- Before pipetting the target, suction culture media/buffer for 1 minute at Output -10 (= 1-2 $\mu$ L) to avoid the target being in ultrapure water.

## 5.2 Suction



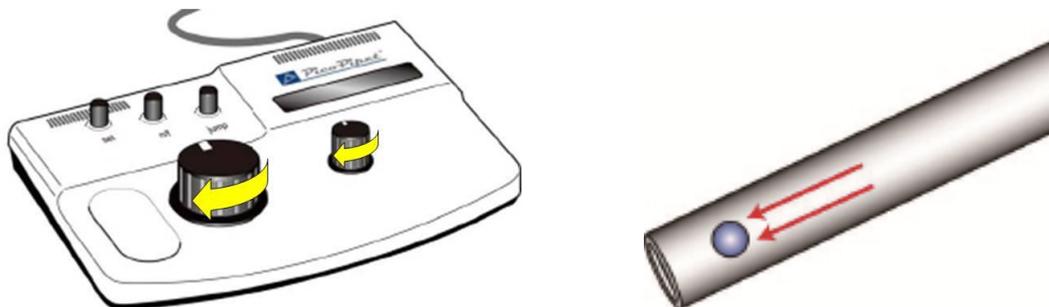
- Decrease the Output value on the display by turning Knob large or Knob small counterclockwise
- The Output range is from -30 to +30.
- The Output increment can be changed by pressing the Step select button.  
Knob large: 0.05, 0.01 or 0.001    Knob small: 0.25
- A beep sounds when the Output value is minus.

**[NOTE]**

During waiting time (leaving the PicoPipet without power off), be sure to change the Output to the set zero value (see 5.4.2 on this manual) to avoid extra suction.

The suctioned targets/liquid going into the pump in the pipette may cause damage to the pump.

## 5.3 Discharge



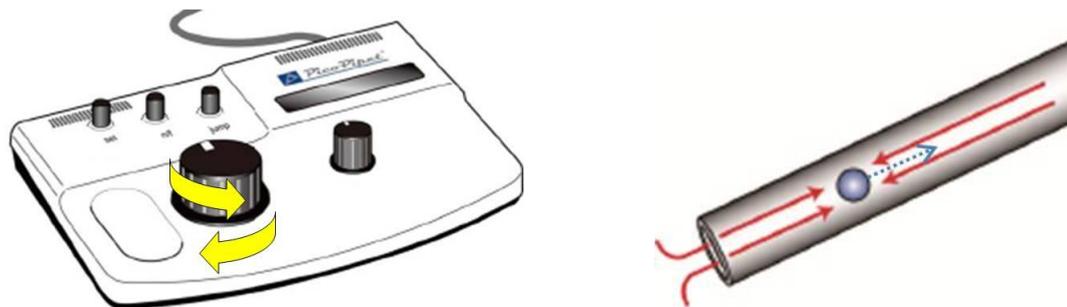
- Increase the Output value on the display by turning Knob large or Knob small clockwise
- The Output range is from -30 to +30.
- The Output increment can be changed by pressing the Step select button.  
Knob large: 0.05, 0.01 or 0.001 Knob small: 0.25

## 5.4 Zero set

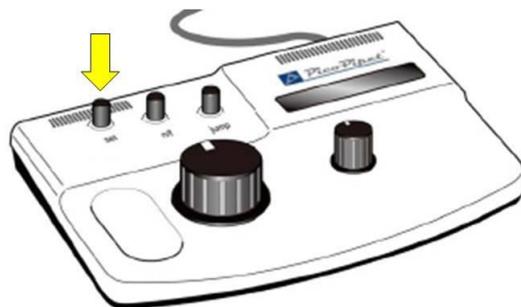
### 5.4.1 Setting a new zero value

Small flow in the glass micropipette can arise at the default zero value of Output. To achieve the best flow for stopping the target, the Output value should be adjusted.

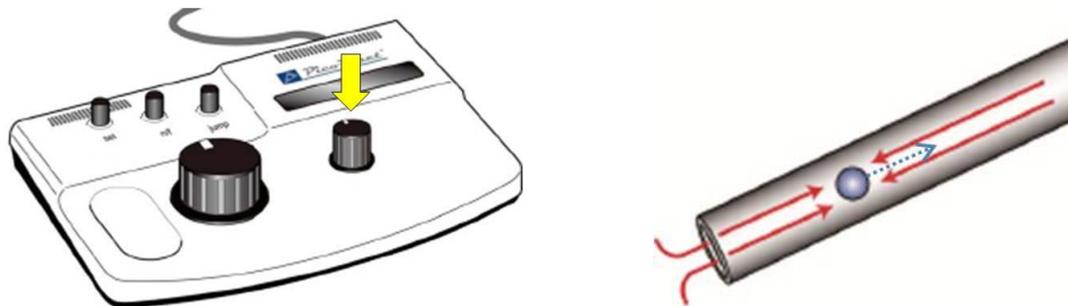
- 1 Pick up the target.
- 2 Turn Kob large clockwise or counterclockwise to stop the target in the glass micropipette. It would be better not to stop the target completely but let the target suctioned just a little.



- 3 Press the Zero set button. Then the current Output will be set as a new zero value and added to the Offset value, and the values on the display change accordingly.



### 5.4.2 Recalling the set zero value

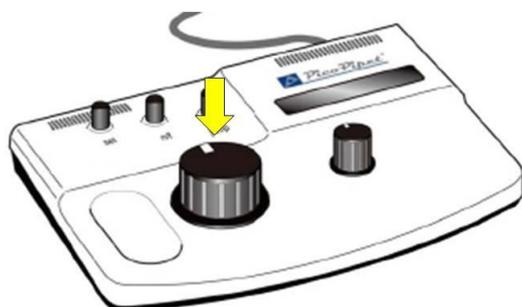


- When the displayed Output value is not zero, press Knob small. Then the Output value will be changed to the set zero value and the display will change accordingly.
- The target/liquid in the glass micropipette will stop.

**[NOTE]**

During waiting time (leaving the PicoPipet without power off), be sure to change the Output to the set zero value to avoid extra suction/discharge.

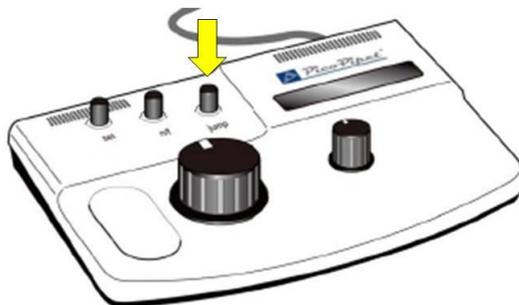
### 5.5 +/- Output reverse



- + or - at the Output value is changed to the other without change of the absolute value by pressing Knob large.

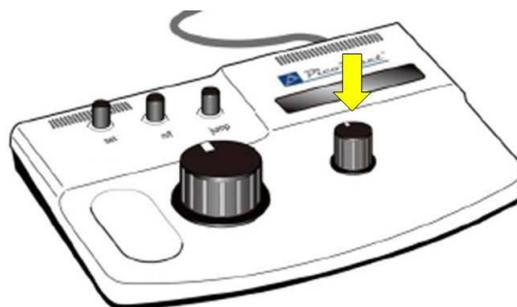
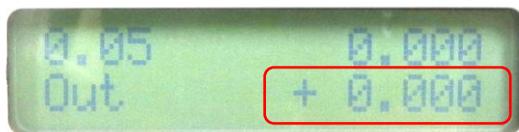
## 5.6 Jump

### 5.6.1 Setting Jump value



- The displayed Output value is saved as Jump value by pressing the Jump set button.

### 5.6.2 Recalling Jump value



- When the displayed Output value is zero, press the Knob small. Then the Output value will be changed to Jump value.

Every time the Knob small pressed, the Output value changes as follows;  
Jump value - set zero value - Jump value - set zero value...

## 5.7 Post operation

### 5.7.1 Washing with ultrapure water

- 1 Power off the PicoPipet controller
- 2 Disconnect the PicoPipet cable.
- 3 Disconnect the silicone tube and the glass micropipette.

#### [TIPS]

When disconnecting the glass micropipette from the silicone tube, rotating the glass micropipette helps it detached from the silicone tube smoothly

- 4 Connect the syringe to the pipette part.



- 5 Push the plunger to push out the residual water/medium/buffer and air in the pipette part and fill the pipette part with ultrapure water. Until air bubbles in the pipette disappear, keep pushing the plunger.



- 6 Cover with the reservoir cap



- 7 Put the pipette part back into the pipette box.



# 6 Specifications

Flow Rate	1 nL/min to 10 $\mu$ L/min with PicoPipet pipette part
Output Voltage Settings	Knob large: 0.05 / 0.01 V increments Knob small: 0.25 V increments Zero set +/- polarity reverse Jump set
Output Voltage Range	-30 to +30 V
Input Rating	Power adapter: AC100-240V 50/60Hz
Operating Environment	Temperature: 5-40°C, Humidity: 80%RH Max (Non-condensing)
Dimensions	187 (W) x 124 (D) x 46 (H) mm
Weight	0.3 kg



# 7 Warranty

## ■ Limited warranty for products

Nepa Gene Co., Ltd., warrants that its products, as delivered, shall conform to its specification and be free of defects in materials and workmanship when used in accordance with their intended use. This warranty is limited to twenty-four (24) months from the product's original date of shipment from Nepa Gene Co., Ltd.. The warranty for non-durable products is limited to thirty (30) days from the product's original date of shipment from Nepa Gene Co., Ltd.. Further, this warranty does not apply to modifications made to the products by the customer, or damage to products resulting from modifications or repairs effected by customer or other personnel not authorized by Nepa Gene Co., Ltd. to perform such work. This warranty shall not apply to damage resulting from (I) loss or damage in transit, (II) unreasonable use, (III) customer's negligence, or (IV) accident. Nepa Gene Co., Ltd. reserves the right to examine the alleged defective goods in order to determine whether the warranty is applicable.

## ■ Limited warranty and disclaimer

Nepa Gene Co., Ltd. warrants that all services supplied hereunder will be performed in a workmanlike manner, except for the express warranties provided to customer under the above "limited warranty for products", Nepa Gene Co., Ltd. makes no other warranties or conditions, expressed or implied, as to the services or parts supplied hereunder, and Nepa Gene Co., Ltd. expressly disclaims all warranties or conditions of merchant-ability or fitness for a particular use.

## ■ Limitation of liability

Nepa Gene Co., Ltd. liability under this agreement is limited to the expense of providing product repair, neither Nepa Gene Co., Ltd. nor its employees or agents shall be liable for indirect, special, incidental, or consequential damages, including without limitation, business interruption, loss of profits or loss of revenues, loss of wages or injury to persons, property or customers. Furthermore, Nepa Gene Co., Ltd. categorically states that the sole and exclusive remedy for nonconforming goods shall be replacement of defective goods or, at Nepa Gene's option, refund of the purchase price to customer. The parties acknowledge that the price of Nepa Gene Co., Ltd.'s products would be much greater if Nepa Gene Co., Ltd. undertook more extensive liability.

Any action by customer for any alleged breach of the warranty stated in this section must be brought to the attention of Nepa Gene Co. Ltdl within 90 calendar days after the end of the warranty period.

### **Notice:**

Products returned to Nepa Gene Co., Ltd. for repair or replacement shall be received prepaid.

If found not to be defective under the terms of warranty a charge will be made for repair or replacement and freight costs will be at customer's expense.

Specifications are subject to change without notice. For this reason and at its sole discretion, Nepa Gene Co., Ltd. reserves the right to upgrade products during a repair process. Prices for out of warranty repairs are subject to change without notice.



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## Contact

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### Instruction Manual

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