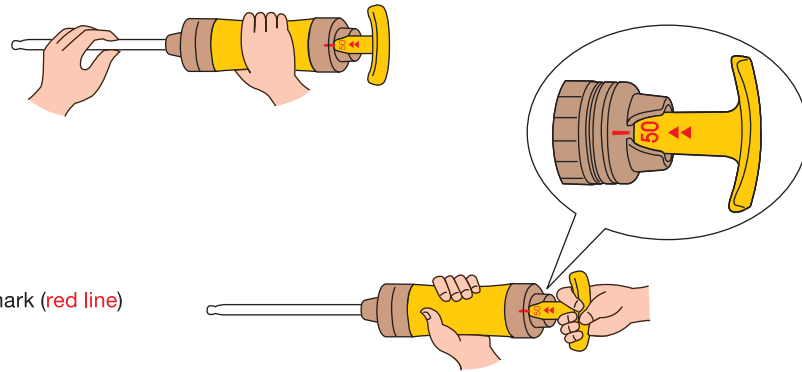


How to Use the pump

1 Inspection before starting the operation airtight test for the pump

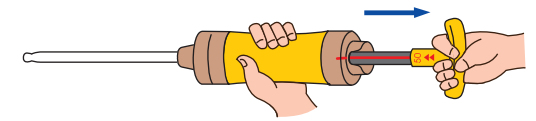
*Operate the pump with it pointing downward.

- 1 Insert a fresh unbroken tube into the detector tube insert port of the pump.



- 2 Push in the handle fully and align the guide mark (red line) with the "50▲▲" guide mark on the handle.

- 3 Pull out the handle completely in one stroke along the guideline. Since the handle is fixed, release your hand from the handle and wait for approximately 30 seconds.



- 4 Rotate the handle 90 degrees with your fingers placed on it.

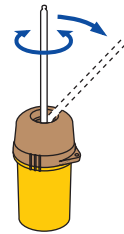


* When returning the handle, be sure to hold the handle with gripped fingers placed on it. Releasing the hand from the handle makes the handle return rapidly and may cause breakage of the gas pump and injuries. If the handle returns to near the original position—state 2, the airtightness is sufficient.

* If the handle does not return to the original position and is located more than 5 mm from the original position, it means that air is leaking. Take measures according to the Maintenance section because incorrect measured values may be obtained (refer to the "Maintenance" section on the lower right).

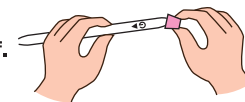
2 Measurement

- 1 Insert the tip of the detector tube in the hollow created on top of the Tip holder as shown in the figure, and rotate the detector tube to scratch the file built into the Tip holder.

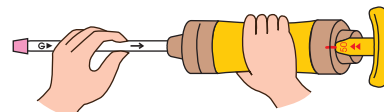


- 2 Bring the detector tube down to break off the tip. In the same way, also break off the opposite tip.
 - * When the Tip holder is filled with accumulated glass waste, put the waste in a plastic bag and discard together with the used detector tubes.

- 3 Be sure to put a rubber cap on the tip on the G marked side of the detector tube that is broken off. Put a blue rubber cap on 31E Oxygen detector tube and put a pink rubber cap on other detector tubes.

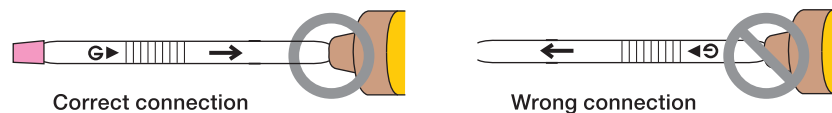


- 4 With the handle pushed in, insert the detector tube into the detector tube inserting port in a way such that the "G▶" mark and "→" arrow printed on the detector tube point to the pump.



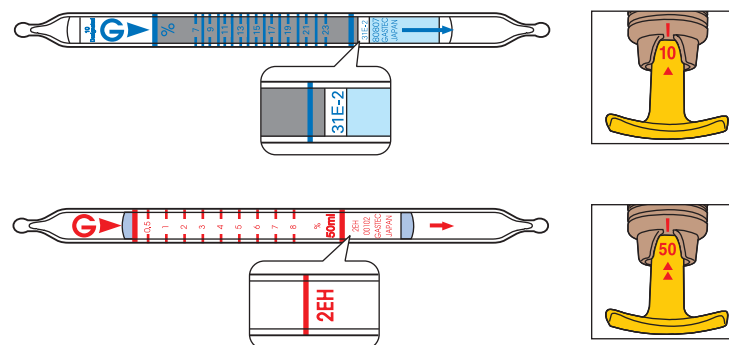
* If the procedure 4 and subsequent procedures are implemented with the detector tube placed in the wrong direction, the measurement cannot be conducted.

Refer to the "For Safety" section.



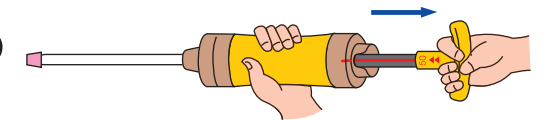
- 5 Align the guide mark (red line) with the guide mark on the handle.

Each handle has both "50▲▲" and "10▲" guide marks. Align the "10▲" guide mark for the 31E-2 Oxygen detector tube and the "50▲▲" guide mark for other detector tubes with the red line.



- 6 Check the direction of the inserted detector tube again. Pull out the handle completely at one stroke along the guideline. Since the handle is fixed, release the hand from the handle and wait for approximately one minute without moving pump from the place of experiment. (Wait for approximately 30 seconds in the case of the 31E-2 Oxygen detector tube.)

* The gas is sucked slowly for approximately one minute (for approximately 30 seconds in the case of the 31E-2 Oxygen detector tube).



- 7 While gripping the handle with your fingers, rotate the handle 90 degrees and release the lock, during this time do not pull the handle. If the handle does not return, it means the measurement is completed.

* If the handle returns, it means the measurement has not yet been completed. Therefore, rotate the handle 90 degrees from the current position to the original position, and then pull the handle along the guideline. After approximately 10 seconds, turn the handle 90 degrees again. If the handle does not return, it means the measurement is completed.

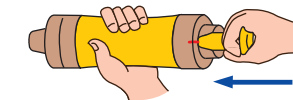


- 8 Disconnect the detector tube and read the scale. Refer to the "How to read the scale" section.

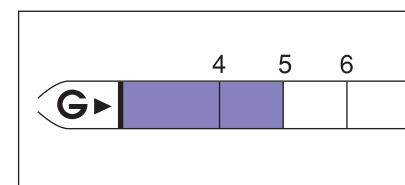
* Touching the oxygen detector tubes immediately after measurement may cause burn injuries because they are heated by the chemical reaction. Refer to the "For safety" section.

- 9 Remove the rubber cap. The removed rubber cap can be reused. Collect the used detector tube and dispose as glass, concrete, or ceramic waste.

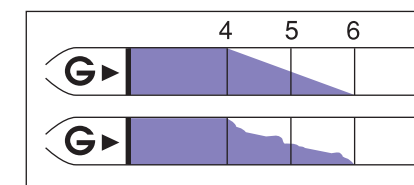
- 10 Push in the handle of the pump.



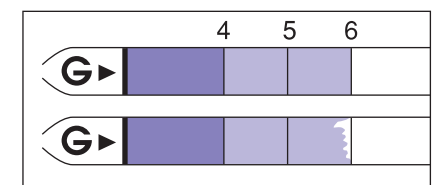
How to Read the Scale



- 1 If the border of the discoloured layer is straight, read the value at the end of the discoloured layer. In this case, the measurement value is 5%.



- 2 If the border of the discoloured layer is slanted, read the value in the middle of the slant. In this case, the measurement value is 5%.



- 3 If the border of the discoloured layer is pale, read the value halfway between the end of the dark layer and the end of the pale layer. In this case, the measurement value is 5%.