

# Assembly and Calibration of the Roller Pump Quick Guide

Below are the guidelines describing how to assemble the roller pump as a part of the AutoWasher Upgrade Package to ZellScanner ONE

Note: To ensure the best results while washing, the roller pump should be calibrated after every change of the tubing, which should occur approximately once every month with continuous use.

## A. Assembly of Tubing and Pump System

1. After unpacking the pump (Fig. 1) and tubing (Fig. 2), unwrap the tubing, remove the orange tape, and gently roll it out keeping the needle on the right-hand side.
2. Place a tubing cassette (Fig. 3) upside-down on a flat surface with the groove to the left-hand side and the tongue on the right-hand side pointing upward.
3. Take the tubing by two adjacent stoppers (e.g. one black-white, one white-black), making sure the knobs on the stoppers are pointing downward and the tube is not twisted.
5. Gently pull the stoppers away from each other to elongate and thin the tubing.
6. Thread the tubing into the cassette gap until the stoppers reach the notches on the sides of the cassette. (Fig. 4 and Fig. 5)
7. Ensure that the pump is not running. When in doubt, switch it off, and remove it from the power source.



Fig. 1 | CyLink Roller Pump



Fig. 2 | Tubing for the AutoWasher

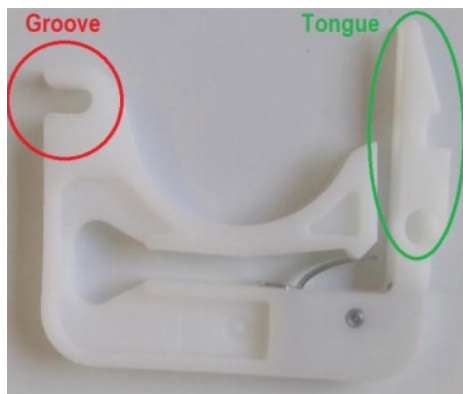


Fig. 3 | Tubing cassette

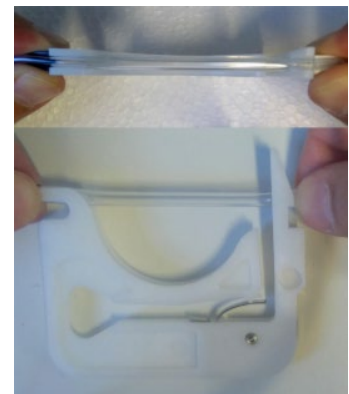


Fig. 4 | Threading tubing into cassette

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## B. Assembly of System Continued...

7. Put the cassette onto the pump head by placing the groove onto the left-hand side bar of the desired channel. (Fig. 6)
8. Fold down cassette until the tongue locks in place with an audible 'click' on the right-hand side bar. (Fig. 7)

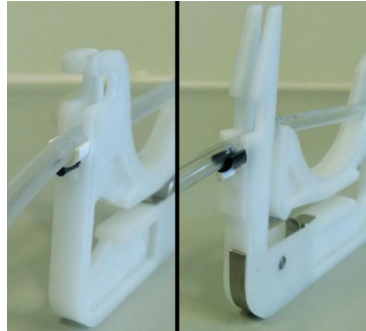


Fig. 5 | Detail showing proper alignment of tubing and stoppers in cassette, avoid twisting.

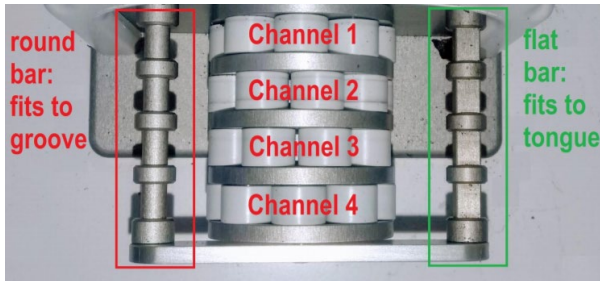


Fig. 6 | Detail view of pump head, Note the different types of bars.

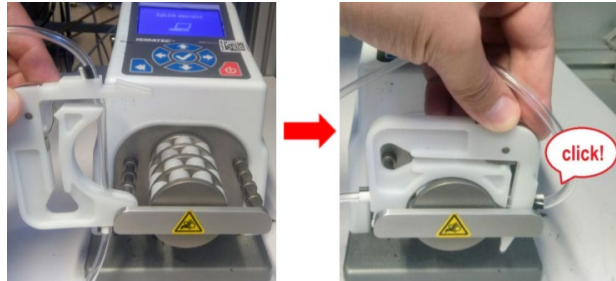


Fig. 7 | Placement of the cassette onto the pump head

9. Carefully unpack the needle so that the hole in the oblique grinding points upward when the needle is laying flat (Fig. 8)
10. Using a pair of pliers, approximately 1.5cm from the point, carefully bend the needle about 45° until the oblique grinding points forward. (Fig. 9)

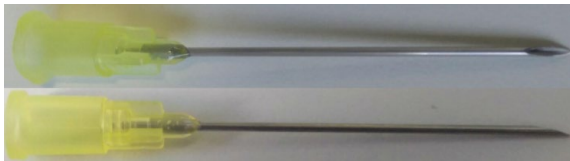


Fig. 8 | Unbent needle, top and side view



Fig. 9 | Bent needle, side view

11. Repeat steps 1-10 for each channel.
12. Place the open ends of the tubing into a bottle of ZKW Washing Buffer, ensure that the end is always submerged.
13. To release or remove the cassette, press against the tongue and lift the cassette simultaneously. If tubing is filled with buffer, close the green hose clip to prevent buffer from leaking out prior to cassette release.
14. When the pump is idle for long periods of time, the cassette should be released to allow relaxation of the tubing.
15. After 3 months of use, the position of the tubing between the stoppers should be changed to allow the stretch of the tubing that was inside the pump head to relax.

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## ***C. Calibration of the Pump Heads***

1. Place the needle inside a receptacle, such as a graduated cylinder.
2. Elevate the graduated cylinder above the level of the pump head to allow air bubbles to escape while the tubing fills with buffer.
3. Open the PumpControlApp and select your pump from the drop-down menu in the top right-hand corner.
4. Click on the gear icon in the lower right-hand corner of the head you want to calibrate. See Fig. 6 for the channel numbers.
  - i. Head 1 is located closest to the body of the pump
  - ii. Head 4 is closest to the front
5. From the drop-down menu in the top right-hand corner of the menu select the diameter of your tubing.
6. With the toggle to the left of the diameter menu, you can select the direction of flow. If you have placed the needle to the right of the pump, select clockwise.
7. To fill the tubing completely with buffer, enter the following parameters:
  - i. Flowrate: 5mL/min
  - ii. Volume: 25mL
  - iii. Time is calculated automatically
  - iv. Cycles: 1
  - v. Pause: 0 min
8. Click “Save”, click the triangular start button and observe the needle.
9. When the needle is dispensing buffer, click the square stop button.
10. Check the tubing for air bubbles. If bubbles are present, flush the tubing until all bubbles are removed or unmoving.
11. Place the needle in an empty graduated cylinder. Click the target icon next to the gear icon to start calibration. Click “yes” in the next prompt.
12. When pumping stops, enter the volume of the dispensed buffer in the prompt. Click “Accept”. The pump is now calibrated.