



Liquid Handling Station

PRODUCT
INFORMATION

BRAND Liquid Handling Station

Automated wiping of liquid residues

Overview

In everyday laboratory work, the pipette tip is often wiped on the destination or source vessel when pipetting liquids to ensure greater volume accuracy or to avoid cross-contamination due to falling drops. For the calibration of piston-operated pipettes according to DIN ISO 8655, wiping the pipette tip on the edge of the vessel is even mandatory. However, wiping is not possible with most pipetting robots. With the latest software update, the BRAND Liquid Handling Station is now able to wipe off liquid residues from the pipette tip. This technical note presents the new, automated wiping function of the Liquid Handling Station.

Introduction

The BRAND Liquid Handling Station (LHS) can perform a wide range of pipetting tasks precisely and automatically. However, some media tends to form a drop at the pipette tip during the pipetting process. Such drops can have a negative effect on the accuracy of the pipetted volume and can even lead to cross-contamination if the drop falls off in an uncontrolled manner. With the latest software update (V 4.3.) of the BRAND LHS software, such drops can now be wiped off the vessel wall. All that is required is a software update; no hardware upgrade is necessary. This technical note explains and demonstrates the automated wiping process in the LHS.



Scan this QR code to see the wiping process in the LHS in a video.

Material and method

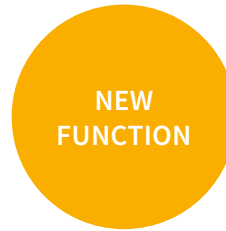
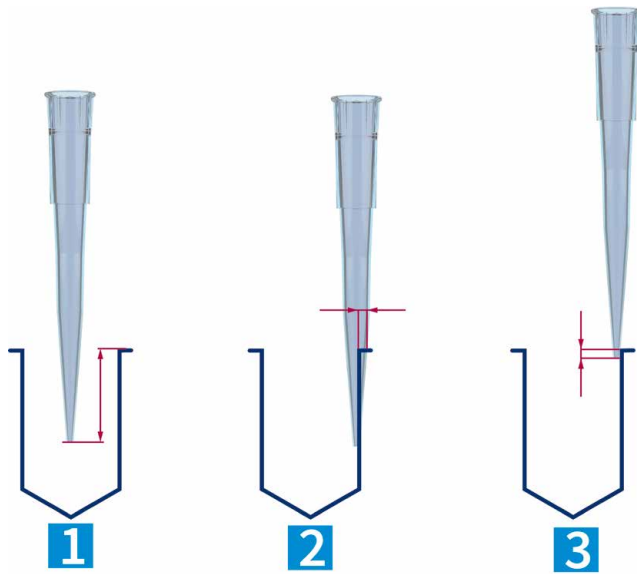


Figure 1
Schematic representation of selected wiping parameters.
Left (1): start depth, center (2): contact depth, right (3): final depth.

When wiping in the LHS, the tip is first centered at a defined height (Figure 1 left, start depth) in the vessel. The tip is then moved horizontally to the edge of the vessel so that contact is made between the pipette tip and the vessel and the tip is pressed lightly against the vessel wall (Figure 1 center, contact depth). The tip may bend slightly in the process. With a further movement, the tip is moved vertically upwards to a defined height (Figure 1 right, final depth) to generate a wiping movement. The LHS software automatically prevents the tip from moving completely out of the vessel in order to prevent the tip from returning abruptly to its starting position. In a final movement, the tip is moved horizontally into the center of the vessel. This completes the wiping movement.

The wiping function can be enabled for aspiration, dispensing, pre-wetting, and mixing. The software counts how often each tip is wiped. This makes it easy for the user to check how many wiping cycles are performed.

In most cases, the wiping function only needs to be enabled with a few clicks in the LHS software to successfully wipe off any drops.

In rare cases, however, fine-tuning the parameters can lead to an improvement in wiping. Three of these parameters are shown in Figure 1.

The start depth and final depth parameters define the start and end points of the wiping movement, measured from the top of the vessel. The difference between these two parameters gives the total length of the wiping movement. The contact depth parameter can be used to set how far the pipette tip is pressed against the vessel wall. Theoretically, a value of 0 mm is sufficient. However, due to manufacturing tolerances of the vessel diameters and the straightness of the pipette tips, the tip must be moved beyond the theoretical position of the vessel wall in order to touch the vessel wall regardless of the tolerances.

In addition to the parameters in Figure 1, two further settings can be made. The direction parameter can be used to set which side of the vessel is wiped. Several sides can also be selected simultaneously. In this case, each vessel is wiped several times. Finally, you can set whether wiping should take place before the air cushion is suctioned, after the air cushion is suctioned or in both cases.

Conclusion

The new automated wiping function of the LHS enables drops to be wiped, which can improve the accuracy and variation coefficient of the pipetted volume and reduce the risk

of cross-contamination. All that is required to use this function is an update of the LHS software. Wiping is then enabled with just a few clicks in the software.

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