

Pipetting

Finnpiquette Novus multichannel pipette—an ideal tool in a low-throughput crystallization laboratory

This document describes the use of the Finnpiquette Novus electronic multichannel pipette in low throughput protein crystallization experiments.

Protein crystallization generally starts with a screen to search for suitable crystallization conditions. A broad range of buffers, pH and precipitants are tested. Typically, 600-800 known but randomly combined conditions are tested for each sample, but often crystals form in only 1-2% of the test conditions. When good lead conditions are found, these conditions are optimized to yield high-quality crystals which are suitable for X-ray studies.

When setting up a crystallization screen, stock solutions (e.g. from a screening kit) are transferred from a deep-well plate (mother plate) to the reagent solution wells of the crystallization plate (daughter plate). This can be done either with a liquid handling robot or manually with a handheld pipette. In a low-throughput laboratory, manual pipetting is often more convenient and cost effective. Robotic dispensing requires high throughput and is reasonable when a large amount of plates are dispensed beforehand for stock. In low-throughput laboratories, this may, however, result in expiring of the daughter plates and incur extra reagent and consumable costs.

Crystallization stock solutions typically contain liquids that are difficult to pipette. Alcohols evaporate easily and the created pressure in the tip causes them to drip out of the tip before dispensing. This may result in too small volumes to be dispensed. Pre-wetting of the tip 3-5 times before actual pipetting reduces this effect. Polyethylene glycols (PEG) and other highly viscous solutions flow very slowly in and out of the tip. Slow aspirating and dispensing or reverse pipetting techniques improve the pipetting results.

Thermo Scientific™ Finnpiquette™ Novus™ multichannel pipette is an electronically assisted pipette for a wide range of liquid handling options. Pipetting is done with minimal effort using natural index finger operation. The finger rest is adjustable 120°, enabling an optimum pipetting position for both left and right-handed users. The unique design keeps pipetting stress to a minimum.

The Finnpiquette Novus multichannel pipette provides 10 different pipetting functions, such as forward, reverse and repetitive pipetting, stepper and diluting modes. There are nine pipetting speeds to select from and both the aspirating and the dispensing speed can be set separately. This option is useful when pipetting volatile or viscous liquids.

These features make Finnpiquette Novus an ideal tool for pipetting crystallization screen solutions.

Selecting pipetting functions and speed

To select the pipetting function, press **Menu** (left selection key). Scroll the function list and select the desired function with **OK** (right selection key). In most cases, the volume can be selected simply by pressing the scroll key up or down.

Accept the volume with **OK**. In some cases, the initial piston position has to be changed and **PRESS TRIGGER** appears on the display. Press the trigger to move the piston to the new initial position. Pipetting speeds can be selected with the right selection key, whenever **SPEED** is displayed. Press **SPEED** and the aspirating speed starts to blink. Select the speed with the scroll key and accept with **OK**. Now the dispensing speed starts to blink. Select the speed with the scroll key and accept with **OK**.

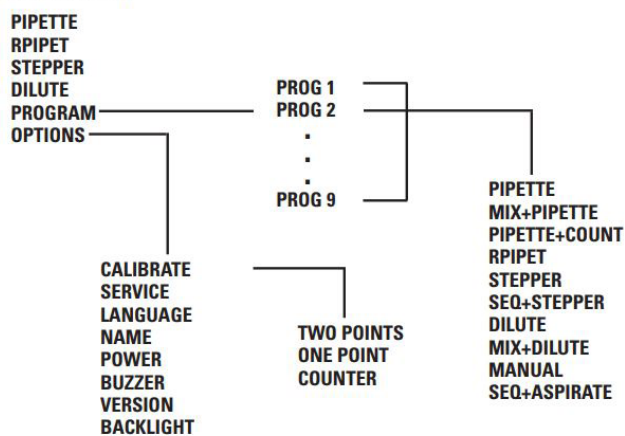


Storing the settings

The settings can be stored in programs that can be edited, stored and retrieved. Additional functions, such as mixing and counter, are available in the program mode (see the menu map below). To retrieve a program, choose **PROGRAM** from the Menu. The display shows the first program (PROG1), select the desired program with the scroll key and accept with **OK**.

If you want to change the settings, press **EDIT**. Select the function with the scroll key and accept with **OK**. Note that there are more available functions than through the main menu. After selecting the function, you can set volumes, speeds etc. as described above. When working with programs, the scroll key selects the program and provides a quick way to switch between different settings.

The Menu Map



FinnpiPETTE Novus menu map.



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