

Diagnostic Kit Manufacturing Application Overview

The liquid handling requirements for diagnostic test kit production are exacting and, with the advancement of molecular diagnostic technologies, increasingly complex. New diagnostic kit technologies may require the precise deposition of multiple reagents, difficult-to-dispense reagents (such as particulates or beads) and/or costly genetic samples, sometimes in complex dispense patterns.

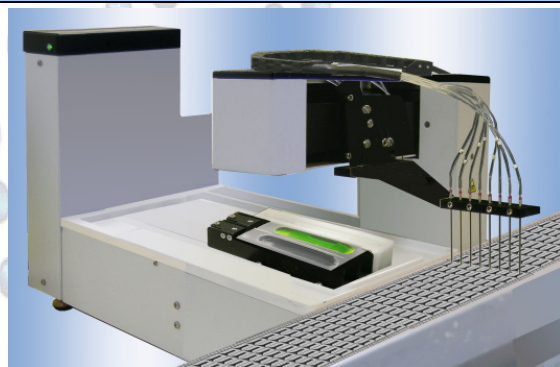
Additionally, system downtime and difficult-to-reproduce dispensing results are anathema to the exacting world of diagnostic test kit production. Traditional (flow-through) low-volume liquid handling technologies frequently suffer either from the effects of inline manifolds or valves located in the fluid path. These systems have poor precision and accuracy, poor reliability and require large dead volumes.

Innovadyne's aspirate and dispense architecture, with a valve-free fluid path, creates a flexible device that is capable of dispensing a wide variety of reagents with much less maintenance than flow-through systems. Innovadyne's proven fluid path technology isolates the syringes and solenoid valves so that they remain in a pristine system fluid environment (degassed, de-ionized water) and so reagents never come in contact with these parts. Combined with tip washing by means of an integrated wash station, an Innovadyne Nanodrop stage can dispense multiple reagents without cross-contamination and function maintenance-free inside a containment cabinet for long periods of time.

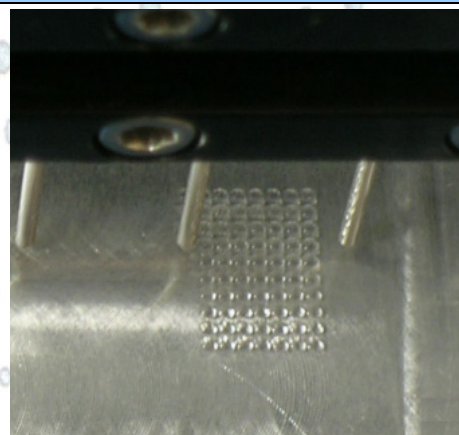
Innovadyne instruments address the following diagnostic kit production needs in different ways:

- Conveyor and reel-to-reel dispensing can be performed with a small-footprint Nanodrop MD-8 or MD-16 stage
- Complex slide dispense patterns can be dispensed with any Nanodrop system, onto SBS-footprint slide-holder plates. Dispense patterns and parameters can be controlled with software ranging from a simple GUI to fully programmable .NET based Nanobuilder sequences.
- Existing motion control systems can be retrofitted to use an 8-channel or 16-channel Nanodrop fluidics module

Nanodrop MD-8 Stage for Reel-to-Reel, Rail and Conveyor Systems



Nanodrop Dispensing a Grid of 50 nL Drops 1mm Apart on a Slide



Application Notes

- **Solving the Challenges of Automated SPA YOx Bead Dispensing (M063)**
- **Developing a Sterile, Reliable Laboratory Setup for Low-Volume Tuberculosis Antibiotic Discovery Assays (M065)**

Technology Briefings

- **High Precision, Non-Contact Dispensing (M002)**
- **Low-Volume Dispensing with the Nanodrop (M021)**

Features

- Small footprint 8-tip and 16-tip stages available that cantilever out over reel-to-reel and conveyor systems
- Single tip access for rare compounds
- Independent channel spotting enables spotting of unique dispense maps
- Easy to maintain and clean
- Flexible aspirate and dispense settings
- User defined syringe speeds and pressure set points
- Ability to clean nozzles between runs
- Low-dead volumes
- Large dynamic volume range: 100 nL-40 uL
- 96, 384, 1536, 3456 plates (including low-profile and deep well)
- User-friendly software
- Simple to integrate with drivers available from most integrators

Platforms

Item	Description	Plate Positions	8-Tip Head	16-Tip Head	Syringe Channels	1,4, or 8-Tip Additions to all Wells
	Nanodrop 8-channel fluidics only	-	-	-	8	-
	Nanodrop MD-8 stage and fluidics	-	Yes	-	8	-
10591	Nanodrop ExtY stage and fluidics	1	Yes	-	8	Yes
11638	Nanodrop II stage and fluidics	2	Yes	-	8	Yes
12056	Nanodrop Express stage/fluidics	1 or 2	-	Yes	16	Yes

Software

Item	Description
11727	Nanobuilder
10591	Nanodrop GUI

Accessories

Item	Description
11193	Reagent refill system (Nanodrop)
	Wide-bore tip set (200 µm)

Specifications (all platforms)

Return-To-Spot Accuracy	0.1 mm
Aspiration Range, 8-Tip Head	0.1-500µL
Dispensing Range (8-Tip Non-Contact)	0.1-40µL
Dispensing Precision, 8-Tip Head	CV<10% at 100nL, CV<7% at 200nL, CV<5% at 1µL
Dispensing Accuracy, 8-Tip Head	±10% at 100nL, ±7% at 200nL, ±5% at >1 µL
Dead Volume, 8-Tip head	1.5µL/channel at 1µL across 384-well plate
Syringe Capacity	500, 1000µL