

PCR Applications

with Innovadyne™ Liquid Handling Instruments

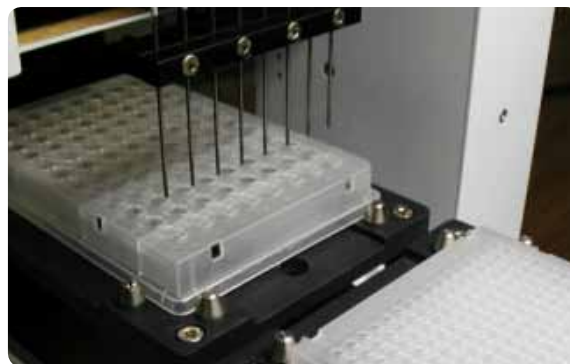
Innovadyne liquid handlers address your requirements for miniaturizing PCR reactions (20 to 50 fold reduction in total reaction volumes) without compromising data quality. Reductions in both reagent and sample consumption not only lower costs, but also increase scalability, further enabling genome-wide approaches. Innovadyne dispense technology precisely delivers low volumes, permitting direct linear reduction of reaction volumes and reagent use without dilution, thus maintaining optimal kinetics and assay performance. The valve-free fluid path design coupled with non-contact dispensing capability further enhance amplification-based methods, with opportunities for carryover in the reaction assembly process inherently minimized.

Flexible aspirate and dispense programmability, such as singletip, random access pipetting, augments Innovadyne broadcast reagent capabilities. In addition to simple reagent additions, complex reagent and template map assemblies are also possible and easily programmed. Innovadyne instruments aspirate from and dispense to a wide variety of plates, reservoirs, reagent trays, and Eppendorf-style tube holders. Innovadyne 96+8 instruments enable 96-tip template and primer transfers, and perform high throughput plate (kit) replication for molecular diagnostics, including a separate 8-tip system for “cocktail” additions.

In the application note “Miniaturizing PCR with the Nanodrop™,” a traditional liquid handling robot dispensing 10µL (total volume) amplification reactions in a 384-well format is compared against a Nanodrop assembling 1.25µL reactions using the same components. The graphs to the right show the results of this test. The chart below shows that the Nanodrop delivers comparable results while significantly reducing reagent costs and sample consumption.

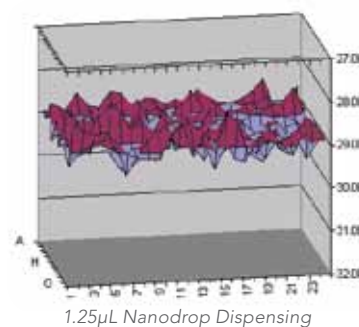
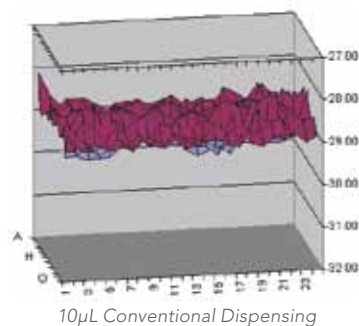
Results

	Traditional liquid handler, 10µL assay	Nanodrop, 1.25µL assay
Ct Mean	28.82	29.03
Ct St.Dev	0.22	0.3
Ct %CV	0.77	1.02
Ct Range	1.2	1.86



Nanodrop II Transferring Sample to a 384-Well Thermocycle Plate

Cycle Threshold (Ct) Values for 384 Replicates



Features (all platforms)

- ▶ 96-tip template and primer transfers and 8-tip system for “cocktail” additions (Screenmaker)
- ▶ Able to dispense to “exotic” plate maps
- ▶ Successful sub-microliter amplification assays
- ▶ Demonstrated lack of carryover
- ▶ Allows pre-dilution scale-down of reagents for sequencing
- ▶ Real time QPCR
- ▶ Sequencing
- ▶ Easy to clean using bleach or other disinfectants
- ▶ High throughput plate (kit) replication for molecular diagnostics (Screenmaker)
- ▶ Options for environmental control (Nanodrop)
- ▶ PCR applications developed in collaboration with molecular diagnostics customer
- ▶ Sequencing applications in development with well respected sequencing center

Platforms

Item	Description	Plate Positions	8-Tip Head	16-Tip Head	96-Tip Head	Syringe Channels	1,4, or 8-Tip Additions to all Wells
10808	Nanodrop I stage and fluidics	1	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
11164	Screenmaker 96+8™	5	Yes	-	Yes	16	Yes

Software

Item	Description
11727	Nanobuilder
10591	Nanodrop GUI (for Nanodrop only)

Accessories

Item	Description
11193	Reagent refill system (Nanodrop)
	Eppendorf tube holder (all platforms)

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 Range (96-Tip)	Screenmaker: 0.1-125µL
Dispensing Precision, 8-Tip Head	CV<10% at 100nL, CV<7% at 200nL, CV<5% at 1µL
Dispensing Precision, 96-Tip Head	CV<15% at 100nL, CV<10% at 200nL, CV<5% at 1µL
Dispensing Accuracy, 8-Tip Head	±10% at 100nL, ±7% at 200nL, ±5% at >1 µL
Dispensing Accuracy, 96-Tip Head	Screenmaker: ±10% at 100-500nL, ±5% at >1 500nL
Dead Volume, 8-Tip head	1.5µL/channel at 1µL across 384-well plate
Dead Volume, 96-Tip head	<1µL/channel
Syringe Capacity	500, 1000µL

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