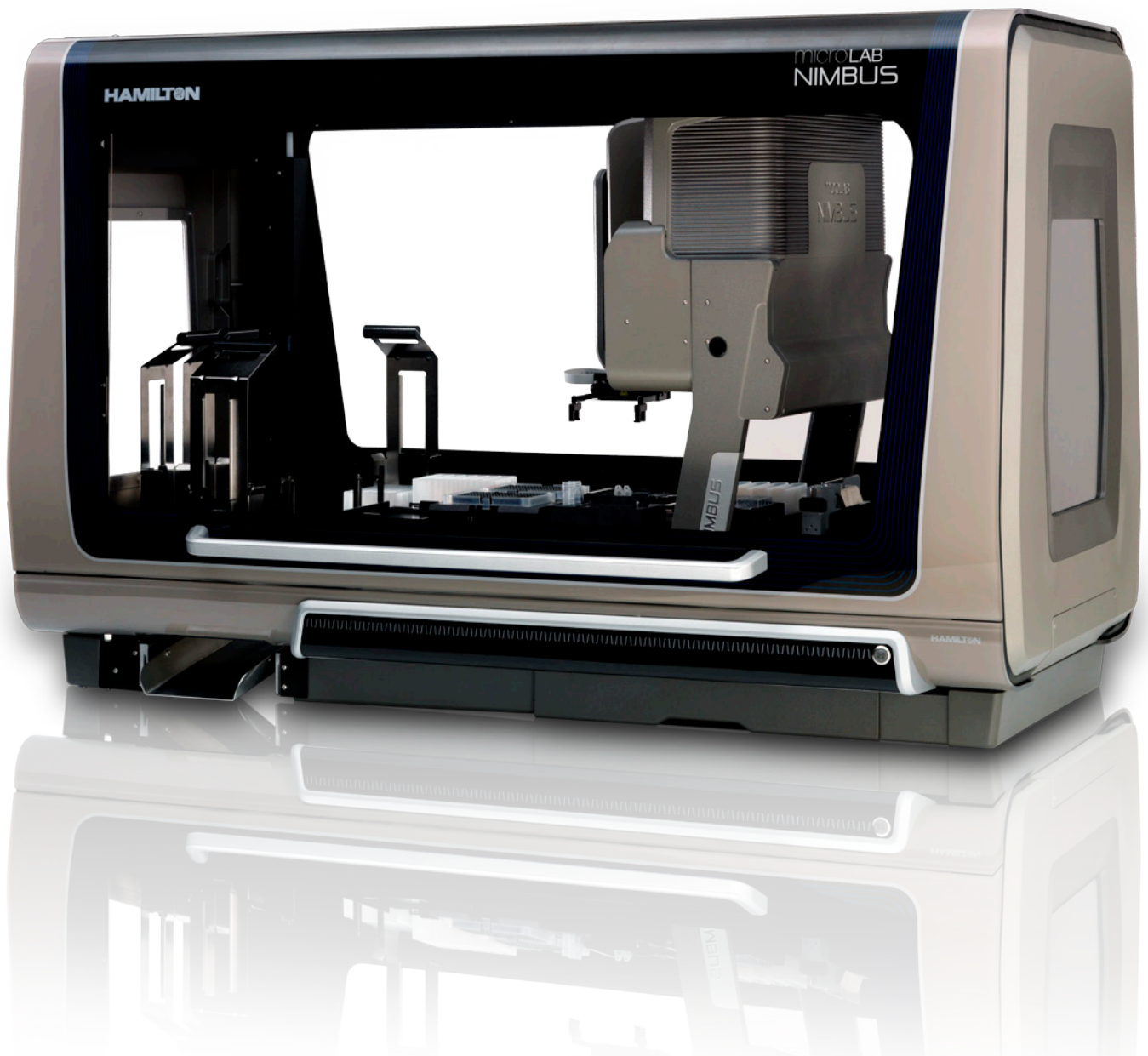


Microlab[®] NIMBUS

Personal Pipetting Workstation



HAMILTON 

Microlab NIMBUS

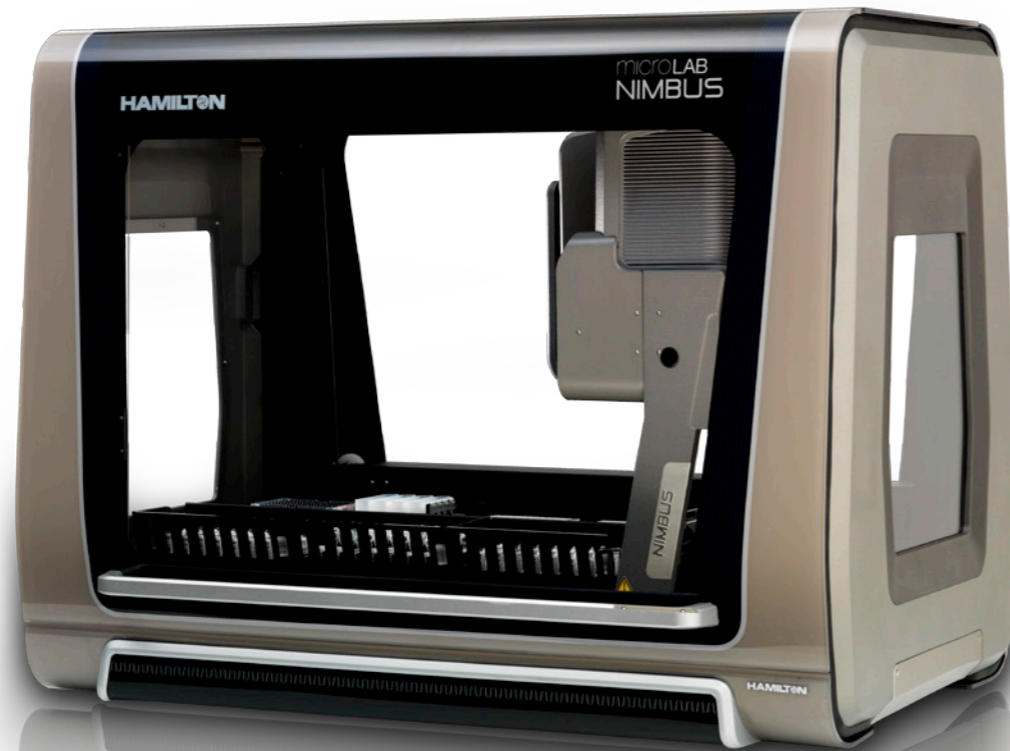
The Microlab NIMBUS is a compact, multi-channel automated liquid handler, offering speed, flexibility, ease-of-use and superior pipetting performance...at a surprisingly affordable price. NIMBUS comes available in two highly configurable base platforms:

- ▶ NIMBUS96: 96-channel multi-pipetting head (MPH)
- ▶ NIMBUS4: 1 – 4 independent 1000 µL channels

Where is Microlab NIMBUS used?

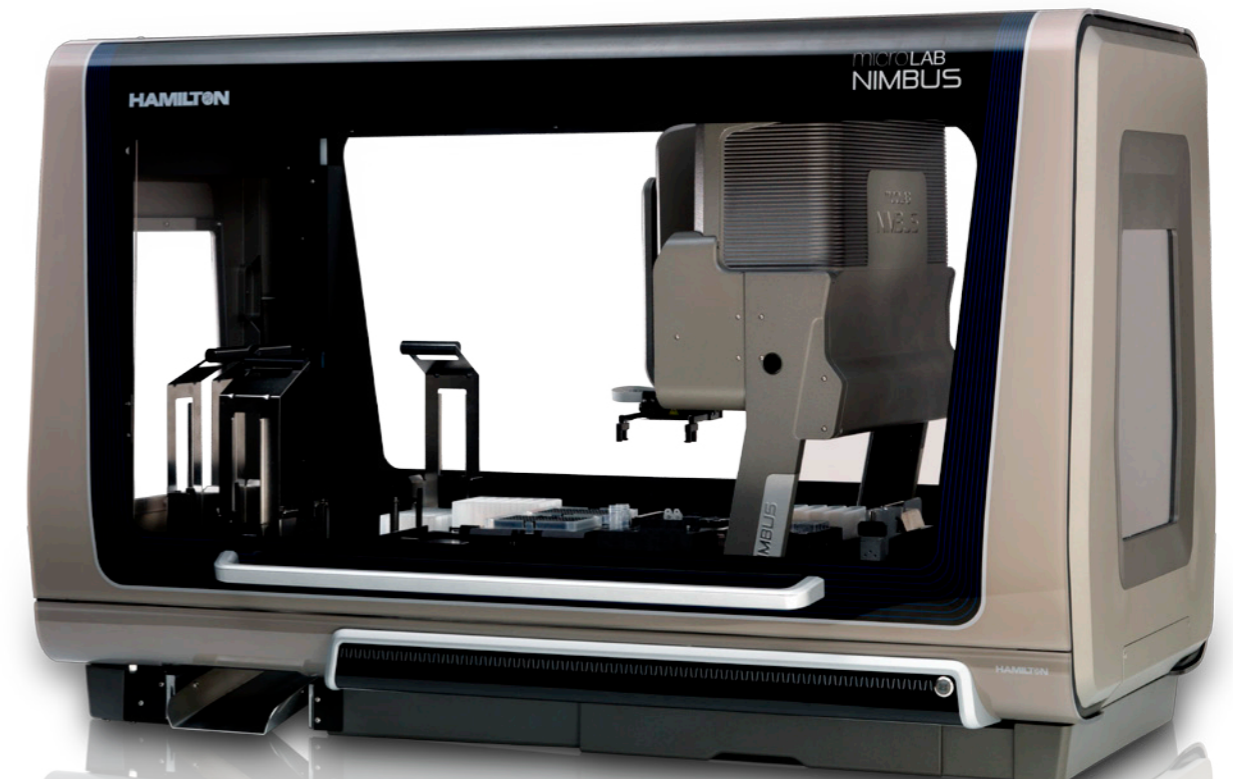
Common industries utilizing NIMBUS include:

- ▶ Drug Discovery
- ▶ Basic & Applied Research
- ▶ Biotechnology
- ▶ DNA Forensics
- ▶ Clinical Diagnostics
- ▶ Environmental Analysis
- ▶ And many others...



Why choose Microlab NIMBUS?

Integrated options, intuitive software and the backing of Hamilton's renowned service and applications support makes the NIMBUS an indispensable tool for budget and space-constrained labs. Using proven air displacement pipetting, NIMBUS offers the same liquid handling performance as higher end systems, yet at a fraction of the price.



Who uses the Microlab NIMBUS?

NIMBUS is a small-scale liquid handler designed for space and budget-conscious labs that require

- ▶ high pipetting accuracy and precision
- ▶ low/medium throughput
- ▶ small footprint
- ▶ affordability

What is a Personal Pipetting Workstation?

In today's laboratory, automation of some workflows is better served by taking a 'divide and conquer' approach.

In contrast to large, multi-integrated, high-end systems designed for automating complex workflows, NIMBUS is a small-footprint, lean-integrated, entry-level pipettor ideally suited for automating a single or select set of liquid handling routines. A flexible deck layout and a broad range of modular accessories and options makes reconfiguration for new applications quick and easy. What's more, an attractive price point makes NIMBUS very affordable, allowing even budget-challenged facilities to place multiple systems into a single laboratory.

Some of the applications the Microlab NIMBUS can perform

DNA/RNA extraction and purification	Microarray sample preparation	Cell assays & feeding	Magnetic separation
PCR setup and purification	Cloning assays	ADMET assays	Liquid-liquid extraction
Post-PCR cleanup	Protein purification & digestion	Solubility assays	ELISA preparation & processing
Sequencing assays	MALDI target spotting	Compound handling	Sample pooling
Sample normalization	CE analysis setup	Solid phase extraction	Genomics, Proteomics & Cellomics assays

Inside the Microlab NIMBUS

The newest member of the Hamilton Robotics family, the Microlab NIMBUS Enclosed, is a high-speed platform with enhanced processing security. The instrument features a 1000 μ L 96-channel MPH for fast plate-based pipetting or up to 4 independent liquid channels for flexible pipetting to and from tubes and plates. NIMBUS Enclosed uses air-displacement pipetting technology for the highest precision and accuracy, and features a locking cover set that minimizes environmental contamination.

Labware Gripper Arm

An optional labware gripper enables easy handling of single or stacked microplates, deep-well plates, lids, and Hamilton's Nestable Tip Racks (NTRs). The systems extended reach and 270 degrees of rotation allow for seamless handoffs to integrated devices located on- and off-deck.

Extension Plate (NIMBUS96)

A plate located on the left-hand side of the NIMBUS Extended Enclosed allows for 4 additional non-pipetable locations. The locations can use Hamilton stackers, pedestals and Hamilton Heater Shaker.



Door Locks

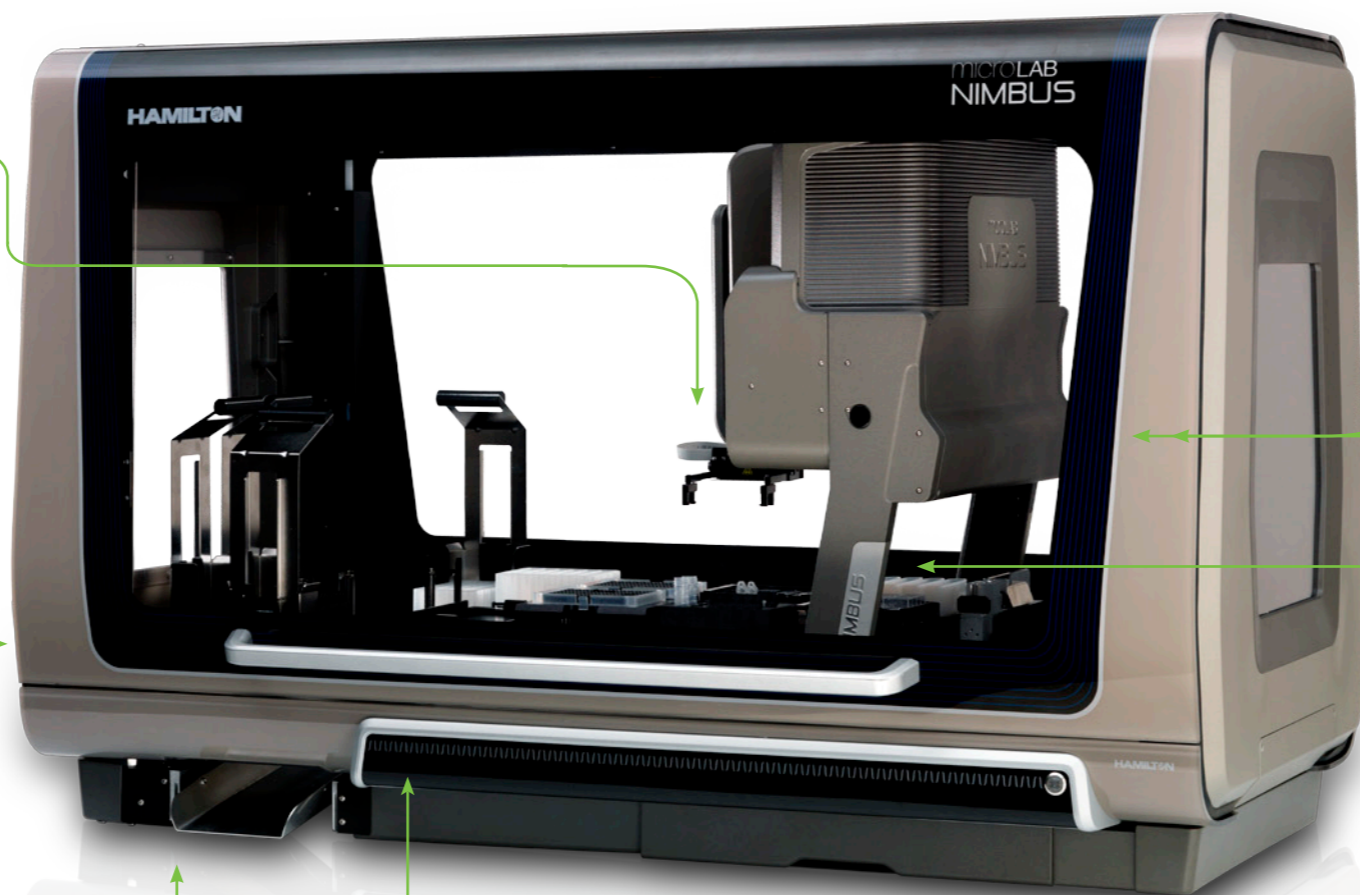
Doors automatically lock when the system is running

Waste Station

A built-in waste receptacle (not shown) accommodates used tips and empty NTRs.

Movement Indicator

Provides at-a-glance cues regarding the movement status of NIMBUS, even from across the room.



4 x Independent CO-RE Liquid Channels

Flexible channels are available in 1000 μ L, enabling independent movement in both Y and Z axes, and an unprecedented pipetting range of 0.5 μ L to 1000 μ L. Each channel features Capacitance Liquid Level Detection (cLLD) and Pressure-Based Liquid Level Detection (pLLD) to handle both polar and non-polar (organic) fluids.

CO-RE II 96 MPH

A high-speed 96-channel head ensures fast and accurate pipetting to 96- or 384-well plates across a wide range of volumes, from 1 μ L to 1000 μ L. CO-RE II also features Capacitance-Based Liquid Level Detection (cLLD).



CO-RE Paddles

Using two pipetting channels in parallel, NIMBUS can transport plates or tips across the deck without the need for a dedicated labware gripper.

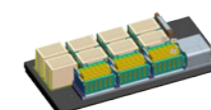
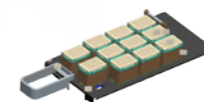
Communications & Control Panel

Simply connect the ethernet cable from your PC to the communications port, plug in the power cable and push the power button to bring NIMBUS to life. An Auxiliary Communications Panel is also featured to support integrated peripheral devices.

Main Deck

The enclosed platform allows for easy loading of pedestals, adapters, plates, tubes, and tip racks onto the high-density main deck. Choose from 2 different deck styles:

- ▶ 9+2 – 9 main deck positions and 2 subdeck positions
- ▶ Shift-n-Scan – 8 main deck positions and integrated tube barcode scanner (NIMBUS4 only)

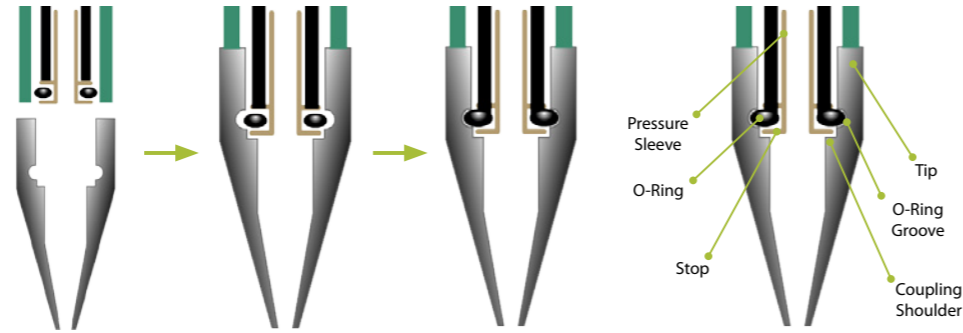


Technology

Innovative technology for higher process performance and reliability.

COMPRESSED O-RING EXPANSION (CO-RE)

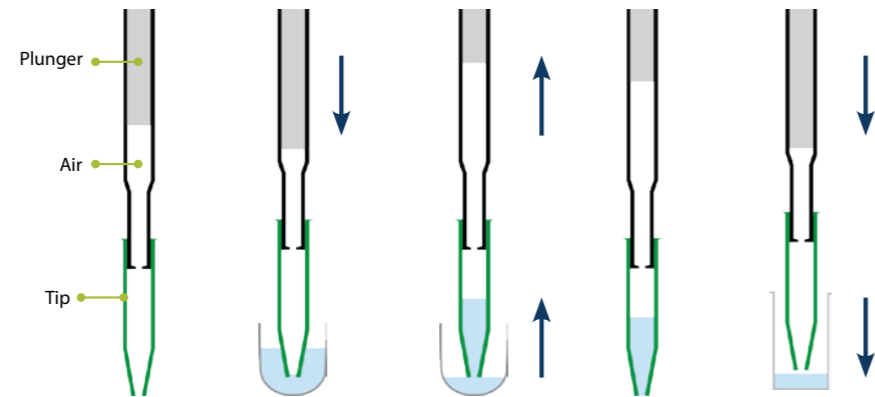
Many of today's applications require precision in tip attachment and positioning. To accomplish this, HAMILTON utilizes proprietary Compressed O-Ring Expansion (CO-RE) technology. CO-RE technology attaches disposable tips using a highly robust lock-and-key style mechanism. This enables a positional precision of $\pm 0.1\text{mm}$ on all axes. The system requires virtually no vertical force for tip attachment or ejection, thus eliminating mechanical stress and minimizing the production of aerosols. Reduced stress also improves overall system reliability and throughput.



AIR DISPLACEMENT PIPETTING

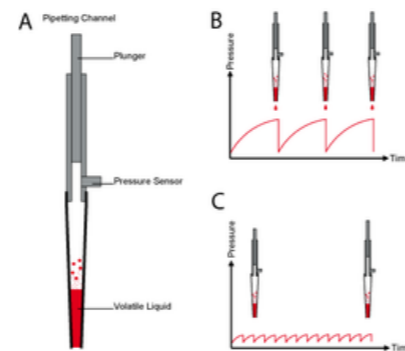
NIMBUS utilizes proven air displacement pipetting, similar to high precision hand-held electronic pipettors. Benefits of this technology include:

- ▶ Reduced risk of contamination or sample dilution (no system fluid)
- ▶ High pipetting accuracy and precision from sub-microlitre to large volumes
- ▶ Increased robustness and easier maintenance owing to lack of system liquids, diluters, valves or complicated tubing



ANTI-DROPLET CONTROL (ADC)

This technology serves to compensate in real time for pressure changes in the liquid channels caused by high vapor pressure of volatile solvents. Upon activation, ADC prevents inadvertent dripping from the channels, reducing the risk of contaminating the deck. (NIMBUS4)



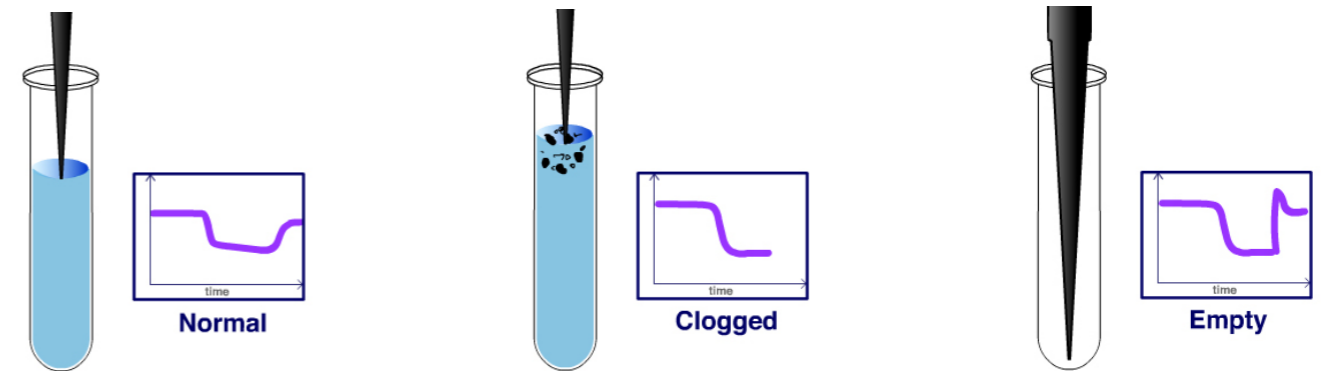
LIQUID LEVEL DETECTION (LLD)

NIMBUS uses LLD technology to determine liquid levels in tubes and plates located on the pipetting deck. There are two modes of LLD: capacitive LLD (c-LLD), used to detect most types of liquids in most types of vessels; and pressure-based LLD (p-LLD), which can detect virtually all fluid types, including foaming liquids and non-conductive organic solvents. cLLD is available on all Hamilton Robotic Systems, NIMBUS96 (MPH channels A1 & H12) and NIMBUS4 (pLLD is available on NIMBUS4 only). For even greater confidence in LLD, a dual mode LLD approach may be used (NIMBUS4 only).



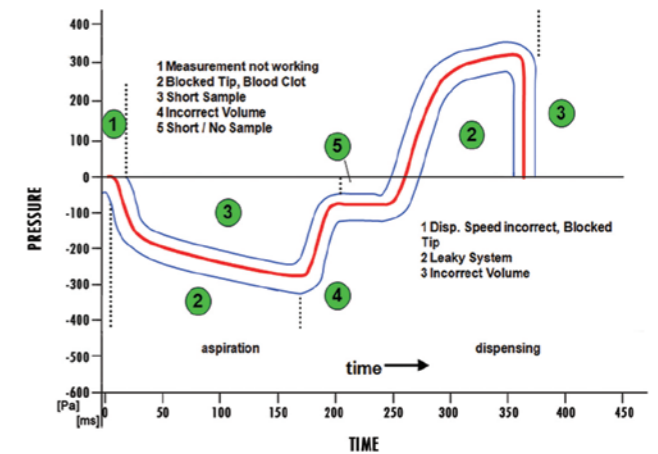
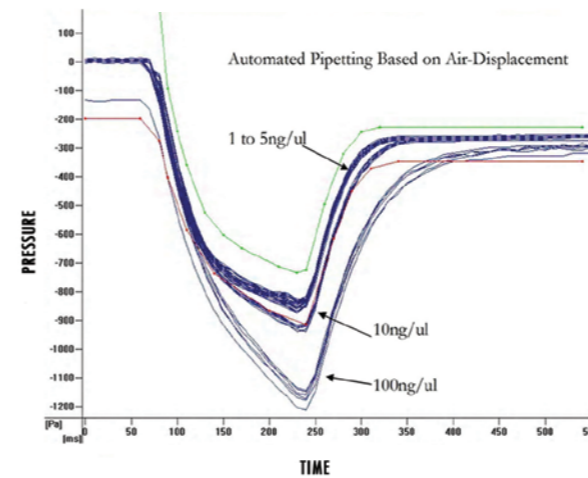
MONITORED AIR DISPLACEMENT (MAD)

By monitoring the air-based pipetting action, NIMBUS can detect clots or empty wells during the aspiration step in real time. It can also be used to pipette highly volatile solvents (NIMBUS4).



TOTAL ASPIRATION AND DISPENSE MONITORING (TADM)

During crucial sample transfers (e.g. *in vitro* Diagnostics or DNA Forensics), parameters may be set to monitor, in real time, both the aspiration and dispense steps. TADM verifies with a traceable digital audit trail that a sample has been successfully transferred (NIMBUS4).



Software

Hamilton's Microlab INSTINCT software provides an intuitive graphical user interface for simplified instrument control and streamlined method programming, allowing you to achieve results faster and with less training than ever before. Hamilton recognizes the critical role that instrument control software plays in overall system usability and end-user satisfaction.

INSTINCT SOFTWARE

INSTINCT features several tools to enhance the end-user experience:

- ▶ Labware Library – a comprehensive menu of commercially available microplates, deep well plates, reagent troughs/tubs as well as the complete line of Hamilton's CO-RE disposable tips
- ▶ Favorites Tool - enables quick selection of your most commonly-used labware
- ▶ Liquid Class Tuner – an easy to use utility for selecting optimal pipetting parameters and improved liquid handling performance
- ▶ 3-D Viewing – an intuitive tool for visualizing deck layouts

SMART PIPETTING

Combining these preferences together with other user-defined input (e.g. pipetting volume), INSTINCT's built-in intelligence provides:

- ▶ Automated deck layouts – auto-populates the pipetting deck with carriers, microplates/tubes and tips, making setup of deck layouts a snap
- ▶ Automated tip tracking – tracks tip usage, location and status of tip racks
- ▶ Smart plate movements – auto-transporting of labware to destination or waste locations

BASIC TASKS

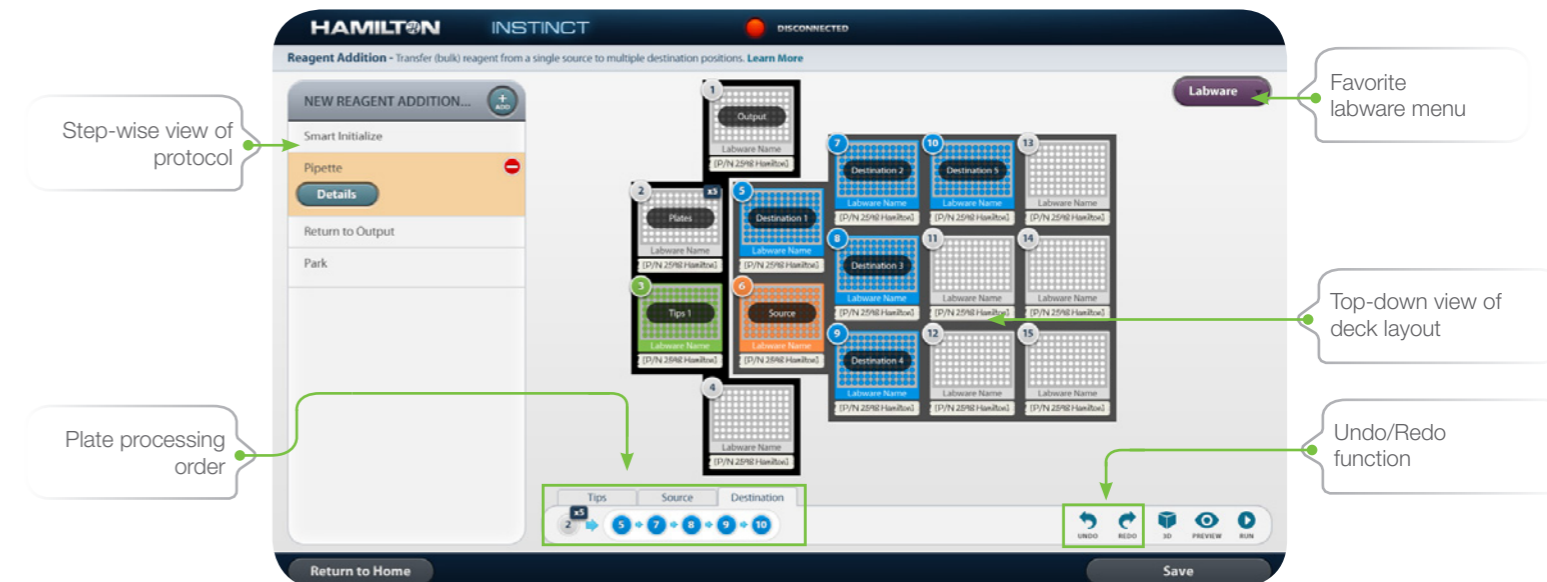
For basic tasks, INSTINCT software features a series of dedicated Wizards available for commonly performed pipetting routines, each guiding you step-by-step towards final method creation.

- ▶ Serial Dilutions
- ▶ Reagent Additions
- ▶ Plate Replications
- ▶ Tube to Plate
- ▶ PCR set-up
- ▶ SPE
- ▶ And many more...

ADVANCED PROGRAMMING

For the most sophisticated methods, powerful VENUS software is also featured as standard, providing the flexibility to create or modify a complex method from scratch, ensuring that your requirements are never compromised. VENUS also features a range of utilities for:

- ▶ Worklist importing/exporting
- ▶ Error handling and recovery
- ▶ LIMS adaptation
- ▶ Database/server controls
- ▶ Scheduling
- ▶ Integrated third party device control



- ▶ Intuitive graphical user interface
- ▶ Designed for users in busy labs from beginner to advanced

Integrated Options

LABWARE GRIPPER ARM (NIMBUS96)

The NIMBUS Labware Gripper Arm option makes for quick and easy handling of single or stacked microplates, deepwell plates, lids and HAMILTON's Nestable Tip Racks (NTRs). Extended reach and 270° of rotation allows for seamless handoffs to integrated devices located both on and off-deck.



1D BC SCANNER

Reads 1D barcodes microplates presented by Labware Gripper or CO-RE Paddles.



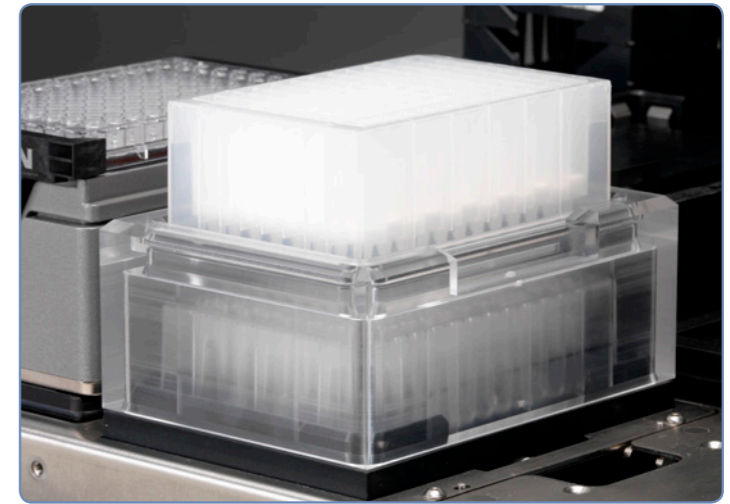
SHIFT-N-SCAN TUBE BARCODE SCANNER (NIMBUS4)

On-deck module for rapid reading of 1D barcoded tubes; accommodates wide variety of tube sizes; compatible with all major symbologies.



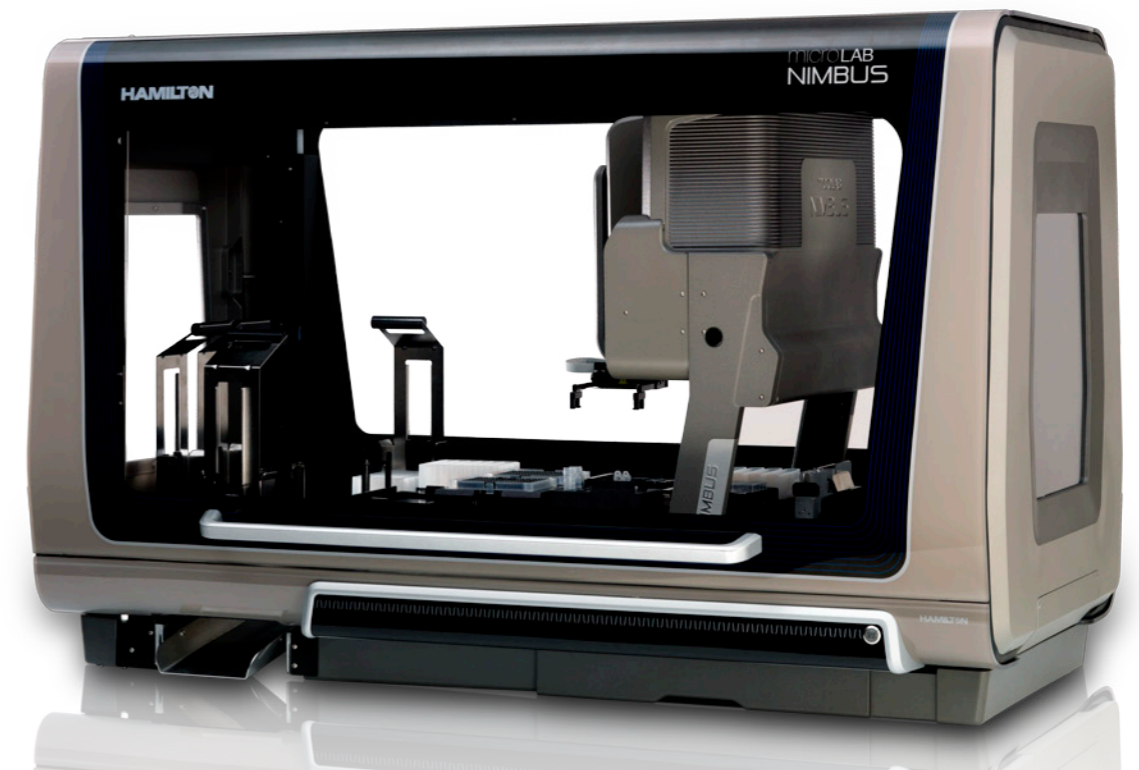
NIMBUS VACUUM STATION (NVS)

Fully software-integrated vacuum system with adjustable pressure control; allows automation of SPE and other vacuum based applications.



HAMILTON HEATER SHAKER 2 (HHS2)

HAMILTON's latest heater/shaker device offers efficient on-deck orbital shaking and heating (up to 105° C). Accommodates a variety of popular standard and deep well microplates.



Labware Handling:**CO-RE Gripper**

(NIMBUS4 only)

CO-RE grippers are a cost-effective means for the on-deck transport of labware. Using two pipetting channels in parallel, NIMBUS4 can transport plates or NTRs tips across the deck without the need for a dedicated Labware Gripper. For transfers to off-deck locations and devices, the Labware Gripper option is required.

**Labware Pedestals :****NTR Pedestal**

holds 1 - 4 x Nestable Tip Racks (NTRs); also used for Small Tube Adapters

**MTP Pedestal**

holds 1 x standard SBS microtiter plate

**DWP Pedestal**

holds 1 x standard SBS deep well plate; also used for PCR adaptors

**FTR Pedestal**

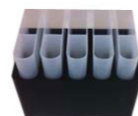
holds 1 x Framed Tip Rack of CO-RE disposable tips

**MTP Labware Gripper & Paddle Stacking Pedestals**

holds a stack of up to 5 x standard SBS microtiter plates

**Reagent Trough Pedestal**

holds up to 5 x 50 mL reagent troughs

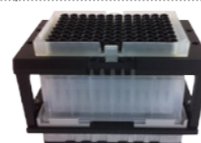
**12x75 - 13x100 mm 32 Tube Position Pedestal**

holds 32 x small sample tubes in one SBS position; accommodates the following tube sizes (diameter x height):

- ▶ 12 mm x 75 mm; 12 mm x 100 mm; 13 mm x 75 mm; 13 mm x 100 mm

**Tip Isolator Pedestal**

available for 50, 300 and 1000 µL tips with an integrated deep well plate. The pedestal prevents cross contamination between re-used tips

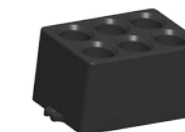
**16x75 - 17x100 mm & 15 mL Falcon Type 24 Tube Position**

holds 24 x medium sample tubes; accommodates the following tube sizes (diameter x height):

- ▶ 16 mm x 75 mm; 16 mm x 100 mm; 17 mm x 75 mm; 17 mm x 100 mm

**50 mL Falcon Like Tubes 6 Position**

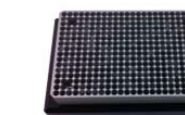
holds 6 x 50 mL (i.e. Falcon brand) tubes

**Labware Adapters:****96 PCR Tray Adapter**

accommodates most commercially available skirted, semi-skirted and unskirted 96-well PCR trays

**384 PCR Tray Adapter**

accommodates most commercially available skirted, semi-skirted and unskirted 384-well PCR trays

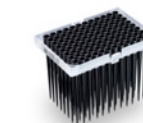
**CO-RE Tip Adapter**

holds 96 x CO-RE tips; required to access single rows/columns of all Framed CO-RE and NTR tips

**Consumables:****CO-RE Disposable Tips**

The use of superior quality tips is essential to maximizing pipetting performance of your automated liquid handling workstation. Hamilton designs and manufactures our own disposable CO-RE tips, ensuring complete control over the production process to yield only the very highest quality product. All CO-RE tips are manufactured under strict tolerances and undergo the most stringent QA inspection process in the industry.

Hamilton's CO-RE disposable tips are available in frames as well as in space-saving, stackable 96 tip Nestable Tip Racks (NTRs). CO-RE tips are available in 10, 50, 300 and 1000 µL volumes, black conductive or clear, filtered or unfiltered, 'clean' (nuclease and pyrogen-free) or sterile.



NIMBUS96 Functional & Performance Specifications:

Parameter	Specification
Input Power (Primary) Universal Supply:	100 - 240 VAC, 50-60 Hz, 5 A
Output Power (Secondary) Power: Wattage:	+42 VDC +5% 600 Watts maximum
Power supply	UL/CSA/CE approved universal power supply with IEC connection
Physical Dimensions (1000 µL) Operating Dimensions Length: Width: Height:	52.75 in. (134 cm) 29.5 in. (74.9 cm) 34.5 in. max (87.6 cm)
Weight:	253 lbs (114.8 kg) approx.

Pipetting specifications for disposable tips -
96 channel CO-RE head

Disposable tip size:	Volume	Trueness R (%)	Precision CV (%)
10 µL: 1 µL	1 µL	5.0%	5.0%
10 µL: 5 µL	5 µL	2.5%	2.0%
10 µL: 10 µL	10 µL	1.5%	2.0%
50 µL: 1 µL	1 µL	5.0%	5.0%
50 µL: 5 µL	5 µL	2.5%	2.0%
50 µL: 50 µL	50 µL	1.5%	0.75%
300 µL: 10 µL	10 µL	3.0%	2.0%
300 µL: 100 µL	100 µL	1.5%	2.0%
300 µL: 300 µL	300 µL	1.0%	2.0%
Test environment & equipment available upon request	1000 µL: 1000 µL	1.0%	0.75%

Liquid level detection
96 channel CO-RE head:

Capacitive liquid level detection (cLLD)
(Channels A1 and H12)

Deck Capacity: 11 positions

Communication type: Ethernet

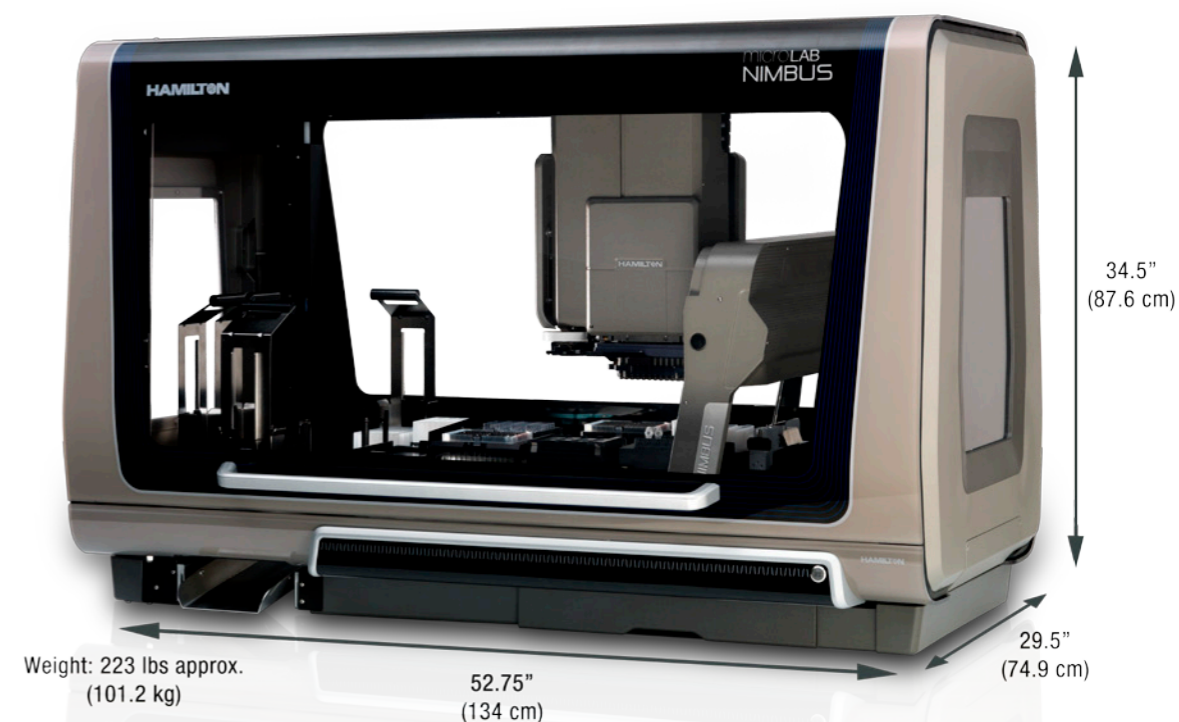
NIMBUS96 Functional & Performance Specifications (continued):

Parameter	Specification
Operating Temperature: Relative Humidity: Altitude:	15° to 35°C (59° to 95°F) 30% to 85% R.H. non-condensing 2000 m (1.2 miles) above sea level
Storage Temperature:	-20°C (-4.0°F) @ 10% humidity to 70°C (158°F) @ 90% humidity non-condensing
CSA Certification Installation category: Pollution degree:	II 2

NIMBUS96 Labware Gripper Specifications:

Parameter	Specification
Plate format	microtiter footprint plate height < 43 mm
Gripping force	5 N – 16 N (default 9 N): Labware Gripper Landscape
Transport mass	300g filled deep-well plate

NIMBUS96 Dimensions



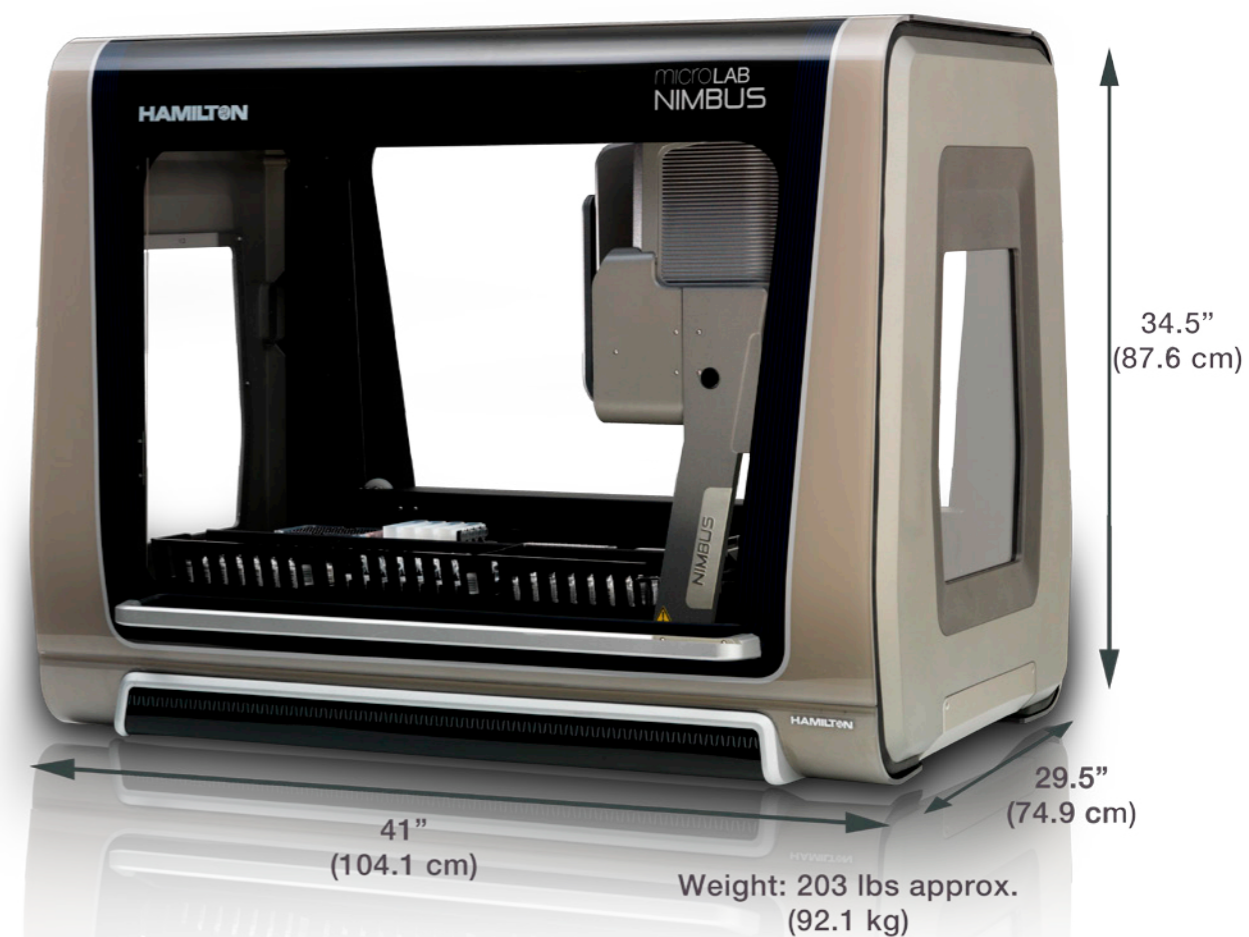
NIMBUS4 Functional & Performance Specifications:

Parameter	Specification																																							
Input Power (Primary) Universal Supply:	100 - 240 VAC, 50-60 Hz, 5A																																							
Output Power (Secondary) Power: Wattage:	+42 VDC +5% 600 Watts maximum																																							
Power supply	UL/CSA/CE approved universal power supply with IEC connection																																							
Physical Dimensions / Operating Dimensions Length: Width: Height:	41.0 in. (104.1 cm) 29.5 in. (74.9 cm) 34.5 in. max (82.5 cm)																																							
Weight	223 lbs (101.2 kg) approx.																																							
Pipetting specifications for disposable tips Disposable tip size:	<table border="1"> <thead> <tr> <th>Volume</th> <th>Trueness R (%)</th> <th>Precision CV (%)</th> </tr> </thead> <tbody> <tr> <td>10 µL: 1 µL</td> <td>5.0%</td> <td>5.0%</td> </tr> <tr> <td>10 µL: 5 µL</td> <td>2.5%</td> <td>2.0%</td> </tr> <tr> <td>10 µL: 10 µL</td> <td>1.5%</td> <td>1.5%</td> </tr> <tr> <td>50 µL: 1 µL</td> <td>5.0%</td> <td>5.0%</td> </tr> <tr> <td>50 µL: 5 µL</td> <td>2.5%</td> <td>2.0%</td> </tr> <tr> <td>50 µL: 50 µL</td> <td>1.5%</td> <td>1.0%</td> </tr> <tr> <td>300 µL: 10 µL</td> <td>3.0%</td> <td>2.0%</td> </tr> <tr> <td>300 µL: 50 µL</td> <td>1.5%</td> <td>1.0%</td> </tr> <tr> <td>300 µL: 300 µL</td> <td>1.0%</td> <td>1.0%</td> </tr> <tr> <td>1000 µL: 10 µL</td> <td>7.5%</td> <td>3.5%</td> </tr> <tr> <td>1000 µL: 100 µL</td> <td>2.0%</td> <td>1.0%</td> </tr> <tr> <td>1000 µL: 1000 µL</td> <td>1.0%</td> <td>1.0%</td> </tr> </tbody> </table>	Volume	Trueness R (%)	Precision CV (%)	10 µL: 1 µL	5.0%	5.0%	10 µL: 5 µL	2.5%	2.0%	10 µL: 10 µL	1.5%	1.5%	50 µL: 1 µL	5.0%	5.0%	50 µL: 5 µL	2.5%	2.0%	50 µL: 50 µL	1.5%	1.0%	300 µL: 10 µL	3.0%	2.0%	300 µL: 50 µL	1.5%	1.0%	300 µL: 300 µL	1.0%	1.0%	1000 µL: 10 µL	7.5%	3.5%	1000 µL: 100 µL	2.0%	1.0%	1000 µL: 1000 µL	1.0%	1.0%
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Test environment & equipment available upon request	For pipetting of less than 10 µL HAMILTON recommends 10 µL/50 µL volume disposable tips to achieve highest pipetting precision.																																							
Liquid level detection Independent Channels:	Capacitive liquid level detection (cLLD) (Pressure liquid level detection (pLLD))																																							
Deck Capacity	9+2 deck 11 positions S+S deck 8 positions																																							
Communication type	Ethernet																																							
Operating Temperature: Relative Humidity: Altitude:	15° to 35°C (59° to 95°F) 30% to 85% R.H. non-condensing 2000 m (1.2 miles) above sea level																																							
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CSA Certification Installation category: Pollution degree:	II 2																																							
Plate format	microtiter footprint plate height < 43 mm																																							

NIMBUS4 CO-RE Gripper Specifications:

Parameter	Specification
Plate format	microtiter footprint plate height < 43 mm
Transport mass	300g filled deep-well plate

NIMBUS4 Dimensions



About Hamilton Company

Hamilton Company is a global enterprise with headquarters in Reno, Nevada; Franklin, Massachusetts; Bonaduz, Switzerland and subsidiary offices throughout the world.

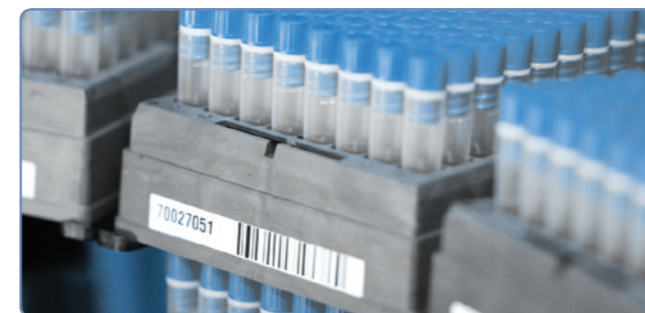
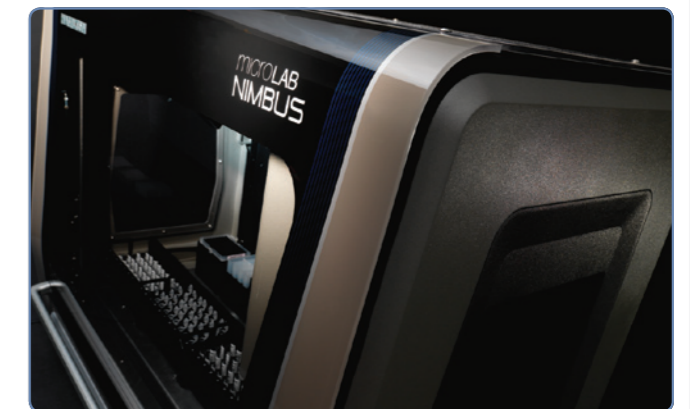
We are an industry leader in the design and manufacture of liquid handling, process analytics, robotics and automated storage solutions. For more than 60 years, Hamilton has been satisfying customer needs by combining quality materials with skilled workmanship to ensure the highest level of performance.

Hamilton's lifelong commitment to precision and quality has earned us global ISO 9001 Certification.



Founded on the technology of analytical Microliter and Gastight syringes, Hamilton has a broad offering of laboratory products including manual and semi-automated precision fluid measuring instruments, chromatography products, process sensors, laboratory electrodes, pipettes and more. Top innovations from these lines include Arc pH, DO and Conductivity Intelligent Sensors, the BioLevigator 3D Cell Culture System, Microlab 600 Diluters/Dispensers and the Microlab 300 Guided Pipetting System.

A pioneer in liquid handling equipment and laboratory automation technology, Hamilton Robotics is known for advancing life science and biotechnology industries through reliability, performance and flexibility. Hamilton is the industry leader in design and manufacturing with patented technologies such as Compression-induced O-Ring Expansion (CO-RE), Total Aspiration and Dispensing Monitoring (TADM) and Anti-Droplet Control (ADC). Hamilton's platforms include Hamilton VANTAGE, its newest vertically-integrated liquid handler, Microlab STAR, Hamilton's highest selling automated pipetting platform, and Microlab NIMBUS, the first in its class of compact, high-speed, personalized pipetting workstations.



Hamilton Storage Technologies offers comprehensive ultra-low temperature automated sample management systems for microtube and microplate storage. Hamilton's line of biobanking and compound storage solutions, as well as consumables, are designed for a broad array of life science processes. Products include BiOS, SAM and ASM, designed for sample integrity, flexibility and reliability.

Hamilton Company is focused on blending invention and accuracy to deliver customers unparalleled products.

microlab NIMBUS

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on blending innovation and accuracy
to deliver customers unparalleled products

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