

Automated Shake, Fire & Flow Control

Reliable Results, Every Time for Metered Dose Inhaler (MDI), Nasal Spray & Nasal Aerosol Testing

Vertus® III Range

Offering precisely controlled and repeatable delivery for Delivered Dose Uniformity (DDU) testing and Aerodynamic Particle Size Distribution (APSD) measurement, the Vertus III and Vertus III+ automate all aspects of MDI, nasal spray and nasal aerosol dose testing.

Compatible with over 40 different collection device combinations including DUSA, Next Generation Impactor (NGI), Alberta Idealised Throat and Nasal Inlets, and Spray Force Tester, the Vertus III range offers total control over the test technique, but the flexibility to apply any industry-standard shake and fire test method.













The Vertus III range offers complete control over all test parameters, including:

Shaking profile <ul style="list-style-type: none">• Speed• Angle• Duration	Time between shake and fire	Firing profile <ul style="list-style-type: none">• Force• Rise time• Hold time• Release time	Air flow through the system
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As the Vertus III range is fully compatible with DecaVertus® III, methods can be easily transferred between systems, with DecaVertus III used to alleviate the burden of through-life testing. See page 8 for more information.



Key Benefits

 <p>Ph. Eur., EMA, USP, FDA, ChP and NMPA compliant</p>	 <p>21 CFR Part 11 compliant</p>
 <p>Precise control over all test parameters</p>	 <p>Compatible with all standard collection devices</p>
 <p>Suitable for a wide range of MDIs, nasal sprays and nasal aerosols</p>	 <p>Integrated air flow</p>
 <p>Ideal for both DDU and APSD</p>	 <p>Suitable for both R&D and QC applications</p>
 <p>In situ impactor leak testing capability</p>	 <p>Extensive reporting options</p>
 <p>Stores and recalls methods</p>	 <p>Broad shake and fire parameters accommodate a wide scope of methods</p>

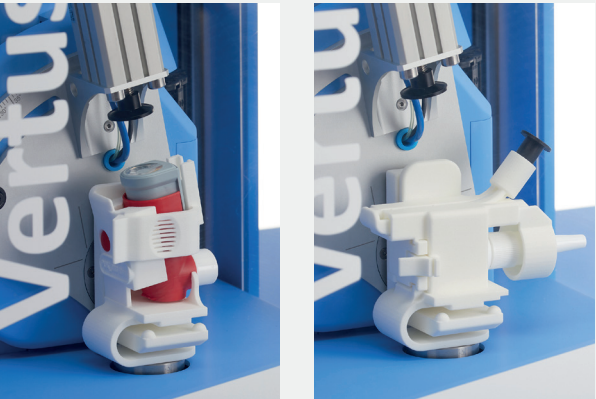
Key Features



Shot Weight Measurement

The Vertus III+ has the additional capability of measuring shot weight (the weight of the dose released during a single actuation) via an integrated analytical balance. Useful for assessing the consistency of drug release from the device, shot weight is an efficient way to detect misfiring and more broadly, for analytical troubleshooting.

Ph. Eur. (monograph 0676) requires the monitoring of Uniformity of Delivered Mass by collecting shot weights of nasal sprays through life. Automation significantly streamlines the testing process when shot weight information is required.



Exhaust Port

The exhaust port supports the efficient extraction of flammable propellants or high potency drugs where additional safety measures are required.



Interface Plates

The Vertus III range is compatible with collection devices for all compendial testing, plus other standard tests for MDIs, nasal sprays and nasal aerosols.

Interface Plates for MDIs



↑ Vertus III shown here with **DUSA Stack** and **Priming & Waste Module**

Priming & Waste Module

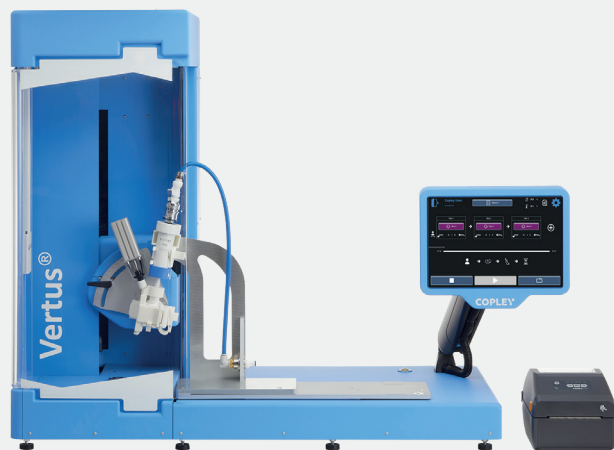
The new Priming & Waste Module integrates firing-to-waste into automated test methods, enabling compendial entire contents testing with minimal manual input.

Each interface plate can be placed directly on top of the Priming & Waste Module. Vertus III and Vertus III+ can switch automatically between priming and test levels, firing-to-waste or to dose collection as required, without operator intervention. This enables highly efficient testing procedures, most notably to meet through-life test requirements for DDU and APSD. Additionally, the Priming & Waste Module can be used as a standalone interface for waste shot collection.

Compatible Test Interfaces

			
Priming & Waste Module only	Next Generation Impactor NGI with Induction Port	Andersen Cascade Impactor ACI with Induction Port	Next Generation Impactor NGI with Adult Alberta Idealised Throat
			
Andersen Cascade Impactor ACI with Child Alberta Idealised Throat	Fast Screening Andersen FSA with Induction Port	Fast Screening Impactor FSI with Adult Alberta Idealised Throat	Glass Twin Impinger GTI
			
Thin Layer Chromatography (TLC) Plate	Fast Screening Impactor FSI with Induction Port	Spray Force Tester SFT	Plume Temperature Tester PTT

Interface Plates for Nasal Sprays & Nasal Aerosols

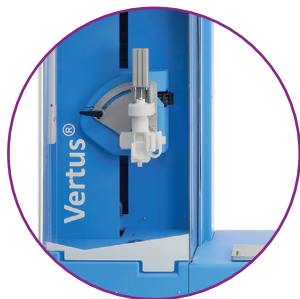


For DDU testing of nasal sprays and nasal aerosols, USP <601> recommends a 'mechanical actuation procedure' to control actuation force, speed, stroke length and for units to be 'thoroughly shaken' prior to firing the dose.

In addition to this, the 2003 FDA guidance on Bioavailability and Bioequivalence recommends automated actuation systems for BE assessments to decrease variability in drug delivery.

← Vertus III shown here with DUSA Interface Plate

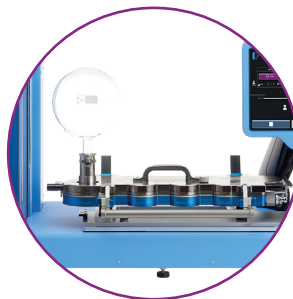
Compatible Test Interfaces



Nasal Spray Dose Collector
NSDC



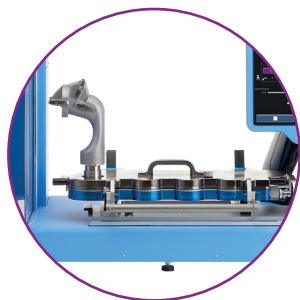
Nasal Spray Waste Collector
NSWC



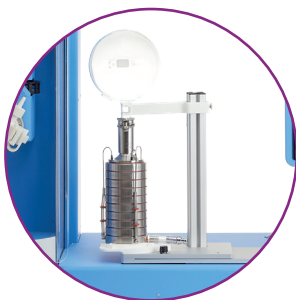
Next Generation Impactor NGI
with 2L Glass Expansion Chamber



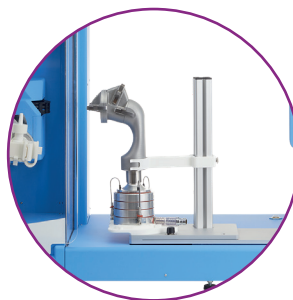
Andersen Cascade Impactor ACI with
Alberta Idealised Nasal Inlet AINI



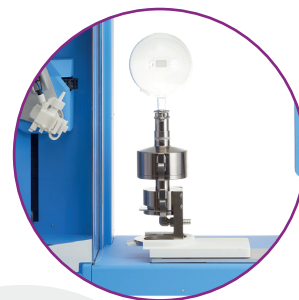
Next Generation Impactor NGI with
Alberta Idealised Nasal Inlet AINI



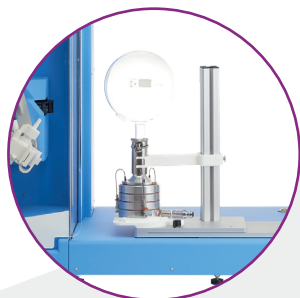
Andersen Cascade Impactor ACI
with 2L Glass Expansion Chamber



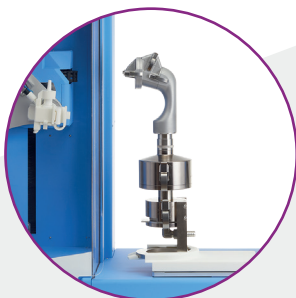
Fast Screening Andersen FSA with
Alberta Idealised Nasal Inlet AINI



Fast Screening Impactor FSI with
2L Glass Expansion Chamber



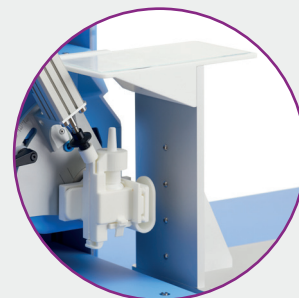
Fast Screening Andersen FSA with
2L Glass Expansion Chamber



Fast Screening Impactor FSI
with Alberta Idealised Nasal
Inlet AINI

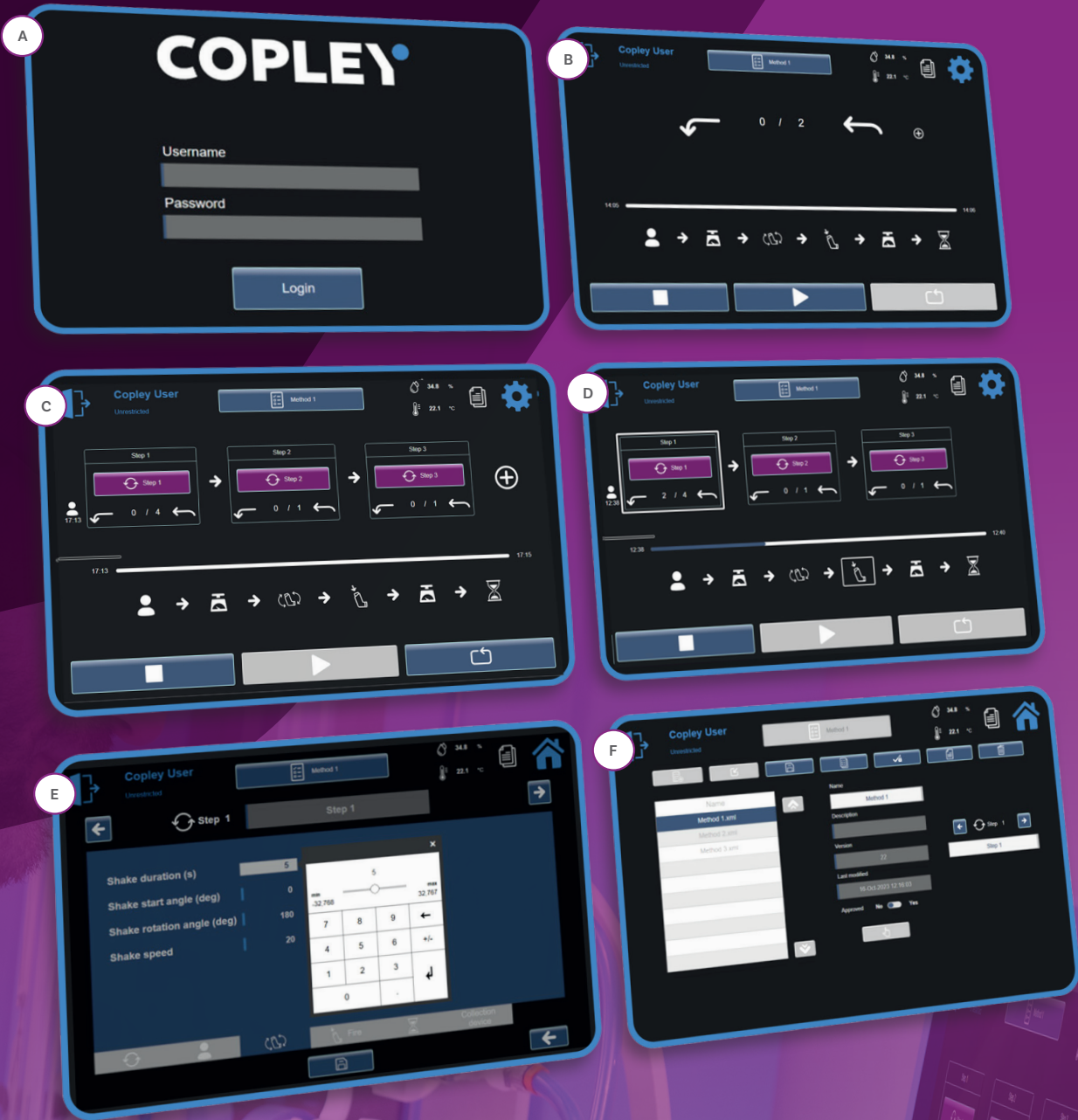


Glass Twin Impinger with
Nasal Adapter



Thin Layer Chromatography
(TLC) Plate

Vertus III: User Interface



- A User log-in screen
- B Main run test screen: single step - ready to test (Vertus III+)
- C Main run test screen: multi-step - ready to test (Vertus III+)
- D Test in progress: multi-step (Vertus III+)
- E Setting a parameter
- F Selecting a method



Technical Specifications: Vertus III & Vertus III+

Shaking parameter control includes:

Shake starting angle	✓	Shake speed	✓
Shake angle	✓	Shake duration	✓

Firing parameter control includes:

Fire force	✓	Force release time	✓
Fire rise time	✓	Firing angle	✓

Air flow parameter control includes:

Air flow rate	✓	Air flow measurement	✓
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Shot weight measurement (Vertus III+ only)

Weight range:	0.01 mg to 200 g
	Resolution: 0.01 mg

Device compatibility

MDIs:	✓	Nasal aerosols:	✓
Nasal sprays:	✓		

User interface:

10.1" colour touchscreen

Dimensions (w x d x h):

1020 x 510 x 920 mm

Connectivity:

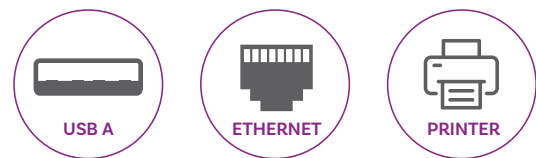
- Ethernet x 4
- USB x 3
- Run Out digital output
- Run In digital input
- RS-232
- Balance for shot weight collection
- Temperature & Relative Humidity probe
- Label Printer

Qualification & Maintenance

- Comprehensive IQ/OQ documentation
- Qualification kit available
- Extended warranty available
- Remote support and field servicing available

Vertus II & Vertus Plus: Reporting

Extensive data output options are available as standard:



Reports:

- Run report
- Audit report
- Method report

Vertus III & Vertus III+

Cat. No.	Description
9770	Vertus III Shake and Fire System
9790	Vertus III + Shake and Fire System
9765	Label printer

For a full list of catalogue numbers and pricing information, please contact sales@copleyscientific.co.uk

DecaVertus® III

Automating firing-to-waste for through life testing of up to ten MDIs per test run, the DecaVertus is a high-throughput system for reproducible, controlled testing.

Highly advantageous from the perspective of enhancing test repeatability, conserving analyst time and eliminating the risk of repetitive strain injury (RSI), the DecaVertus ensures firing-to-waste occurs under closely controlled conditions, eliminating potential sources of variability from testing.

DecaVertus III offers complete control over all test parameters, including:

Shaking profile

- Speed
- Angle
- Duration


Time between shake and fire

Firing profile


- Force
- Rise time
- Hold time
- Release time

Air flow through the system


As DecaVertus III is fully compatible with the Vertus® III range, methods can be easily transferred between systems, enabling the same parameters to be used for dose collection on Vertus III and through life firing-to-waste on DecaVertus. See page 2 for more information.




Key Benefits




Ph. Eur., EMA, USP, FDA, ChP and NMPA compliant




Precise control over all test parameters




Improves reproducibility and frees up analyst time




Stores and recalls methods




Broad shake and fire parameters accommodate a wide scope of methods




21 CFR Part 11 compliant



Suitable for a wide range of MDI devices



Independent air flow control per channel



Extensive reporting options

Key Features

Capacity for up to 10 inhalers at a time

x10



Suitable for device and can-only testing



Large, modern, and intuitive touchscreen for ease of use



Optional: External label printer



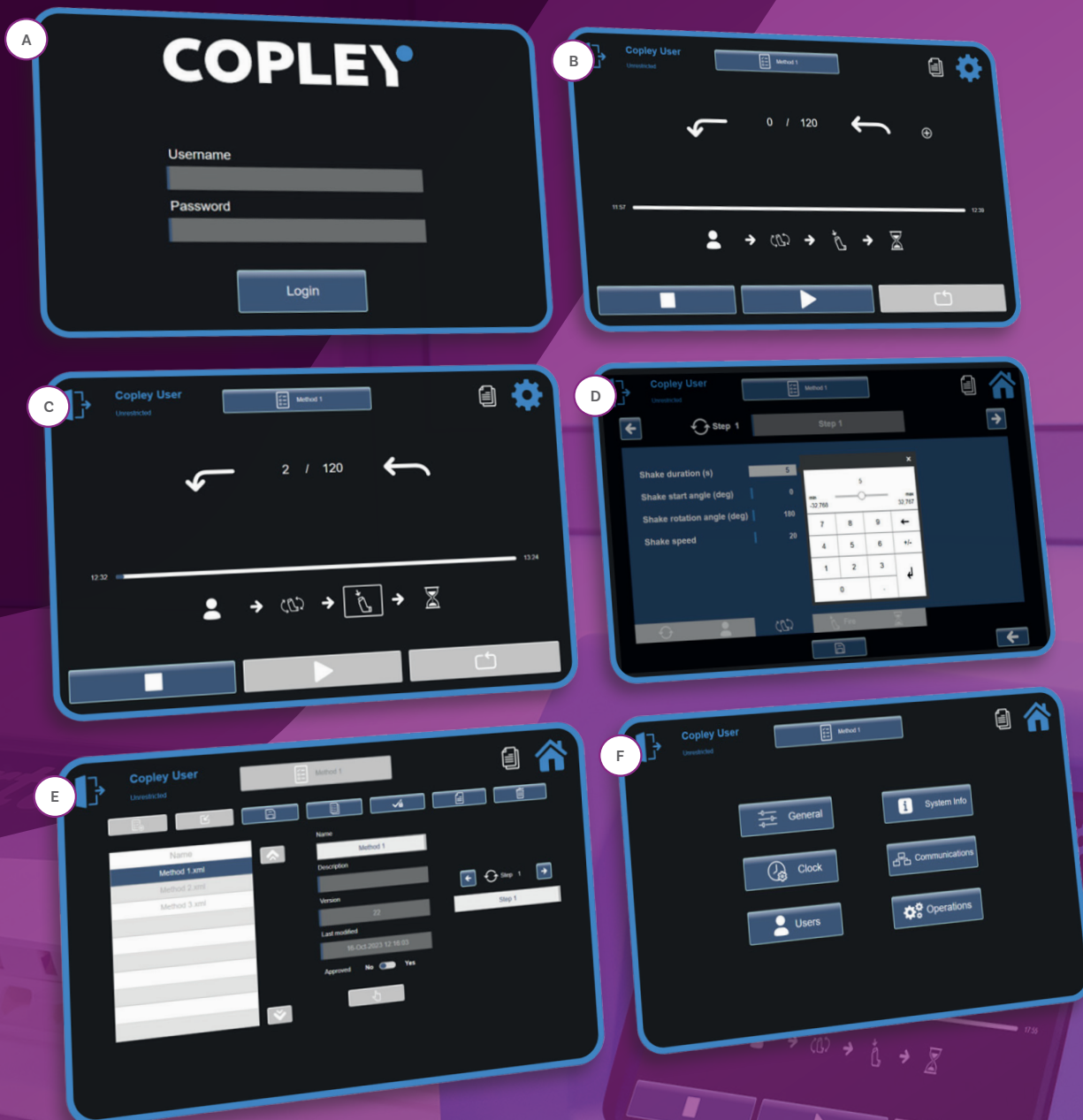
Exhaust Port

The exhaust port supports the efficient extraction of flammable propellants and/or high potency drugs where additional safety measures are required.



Independent air flow control for each channel: each inhaler has its own dedicated air flow channel to minimise clogging and enable high-volume products to be tested in a single run, reducing the need to stop and clean the filters.

DecaVertus III: User Interface



- A User log-in screen
- B Main run test screen (ready to test)
- C Main run test screen (test in progress)
- D Setting a parameter
- E Selecting a method
- F Settings menu



Technical Specifications:

DecaVertus III

Shaking parameter control includes:			
Shake starting angle	✓	Shake speed	✓
Shake angle	✓	Shake duration	✓
Firing parameter control includes:			
Fire force	✓	Force release time	✓
Fire rise time	✓	Firing angle	✓
Air flow parameter control includes:			
Air flow before firing	✓	Air flow after firing	✓
Device compatibility			
MDIs:	✓	Can-only:	✓
User interface:			
10.1" colour touchscreen			
Dimensions (w x d x h):			
1130 x 630 x 370 mm			
Connectivity:			

- Ethernet x 2
- USB x 3
- Run Out digital output
- Run In digital input
- RS-232
- Label Printer

Qualification & Maintenance

- Comprehensive IQ/OQ documentation
- Qualification kit available
- Extended warranty available
- Remote support and field servicing available

DecaVertus III: Reporting

Extensive data output options are available as standard:



Reports:

- Run report
- Audit report
- Method report

DecaVertus III

Cat. No.	Description
9870	DecaVertus III Shake and Fire to Waste System
9765	Label printer

For a full list of catalogue numbers and pricing information, please contact sales@copleyscientific.co.uk




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