

Vmax[®] Encore system

Help move data, not patients

The versatile Vmax[®] Encore system can be configured to meet the demands of various settings. The Vmax Encore system features:

- Spirometry testing.
- Comprehensive pulmonary function testing (PFT) and respiratory mechanics.
- Cardiopulmonary stress testing.
- Energy expenditure data.

Extensive software applications, including:

- Advanced SentrySuite[®] software workflow.
- SentryConnect EMR connectivity.
- Sentry.NET software remote data access.



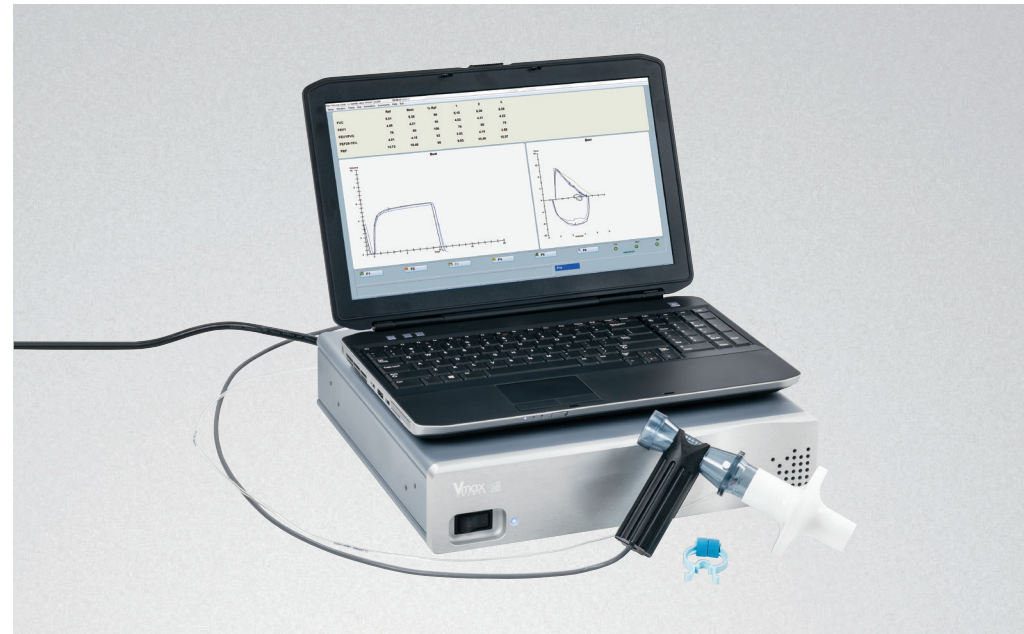
A choice in spirometers

All instruments come standard with basic spirometry (FVC, SVC, MVV), pre/post medication testing and animation incentive programs. The Encore 20c spirometer is your entry-level instrument into the Vmax Encore family and provides:

- Quality, repeatability criteria prompts.
- Portability by integrating with a notebook computer and small footprint ICU cart.
- Expandability to include comprehensive PFT, exercise and energy expenditure testing capabilities.
- Guidelines for pre-school spirometry.

Other CareFusion spirometers can also integrate spirometry data into the database of record, including:

- MicroLoop® and MicroLab® portable handheld spirometers that feature clear touch screens and easy icon-driven menus.
- The Vmax Vyntus™ SPIRO that plugs directly into a USB port and uses SentrySuite software to improve workflow and data management.





Impulse Oscillometry System (IOS)

IOS enables patient evaluations with effort-independent pulmonary function testing, only requiring that the patient breathe quietly during measurement. As a result, IOS is easy for both the patient and the technician to complete. A Vmax Encore system operator can easily detect subtle changes in the patient's airway resistance and response to bronchodilator administration. The IOS system is more sensitive than spirometry in measuring airway hyper-reactivity to air temperature changes, bronchochallenge testing or post-bronchodilator effects. It's applicable to a wide range of patient populations from children as young as two years old, to adults, to geriatric patients, and it's able to help differentiate between central and peripheral airway obstruction.

Aerosol Provocation System (APS Pro)

The integrated APS Pro design allows bronchial provocation protocols to use a single concentration of the challenge substance, making bronchial provocation testing cost effective, simplified and more efficient. Key features include:

- Computer-controlled nebulization.
- Real-time visualization of dose administration and breathing patterns.
- Two modes of administration (*pulse or continuous nebulization*).

Vmax Encore 22 comprehensive PFT system

The Vmax Encore 22 comprehensive pulmonary function testing (PFT) system delivers an efficient and extremely flexible design, containing all the tests, features and capabilities you require in one fully integrated, compact platform. The comprehensive system offers:

- Highly accurate and stable testing data, including flow sensing real-time BTPS correction.
- Efficient testing procedures and new SentrySuite software reporting and workflow, leaving clinicians more time with patients.
- Enhanced automatic data interpretation.
- Automated quality assurance, including real-time monitoring/alerts, an automated sensor stability check, measured CO₂ cross-sensitivity and a data manager to view error codes.



Vmax Encore PFT on console, with Vmax IOS impulse spirometry and Vmax APS Pro nebulizer



Vmax Encore PFT with table configuration



Vmax Encore PFT on ICU cart with laptop computer for portability

In addition to spirometry, the Vmax Encore 22 performs all the essential PFT tests, including:

- Lung volume by nitrogen washout with automatic leak detection.
- Diffusing capacity, ATS recommended real-time single breath and intra-breath (*validated, non-breath holding*).
- Maximum inspiratory and expiratory pressures.
- P0.1 for measuring CO₂ response.
- Closing volumes.

Improve accuracy by incorporating the simple 20-second breathing maneuver of the MicroCO handheld monitor to measure the % COHb and adjust Vmax DL_{CO} results for the level of CO already attached to the patient's RBC due to smoking.



Vmax Encore Autobox cabin

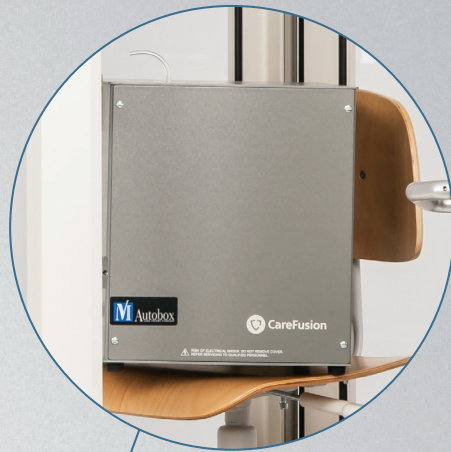
Plethysmographic testing provides fast, precise measurements of both thoracic gas volume (VTG) and resistance (Raw). Unlike traditional gas dilution methods, which rely on airway patency to conduct tracer gases to non-obstructed areas of the lungs, lung volumes using plethysmography VTG will not be underestimated. Airway resistance referenced to absolute lung volume is an essential indicator of lung volume change to bronchodilation not typically reflected in FEV1. Bronchoprovocation testing can effortlessly be completed without repeated forced maneuvers, which aids patient compliance.⁴ Key features include:

- Lung volume, resistance and spirometry tests.
- Two cabin sizes—standard and 1,400 L wide body plethysmograph.
- All tests can be performed in the box, including gas dilution, so “trapped gas” (*difference between body box lung volume and gas dilution lung volume*) can be quantified.
- Both VTG and Raw can be obtained via the conventional panting technique or quiet breathing technique.
- Transmural (*through the wall*) patient breathing allows compression-free FVL measurements that accurately determine patient effort.

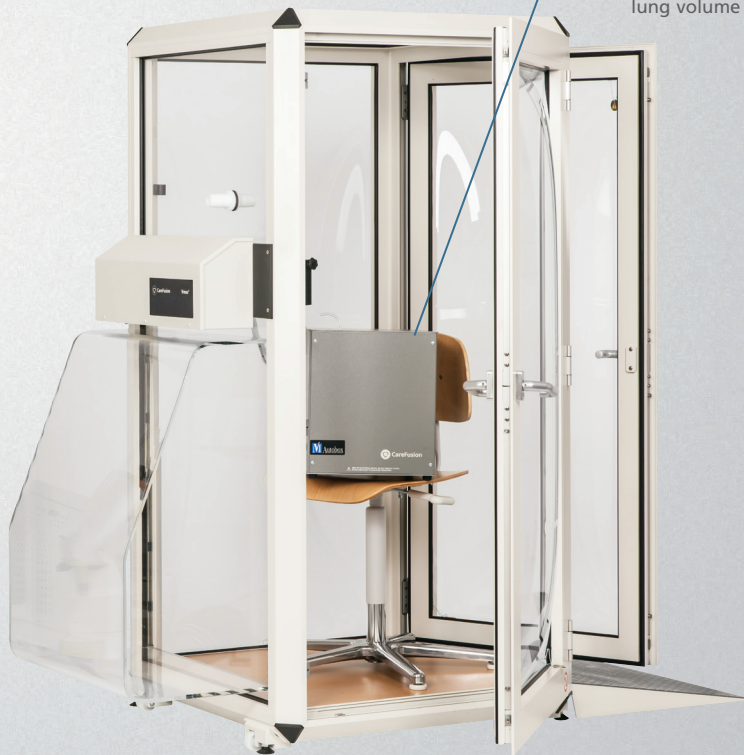


Vmax V62J Encore
Autobox cabin





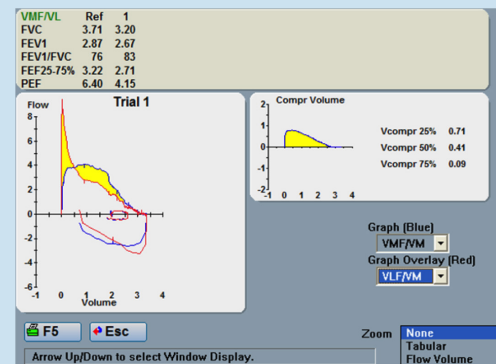
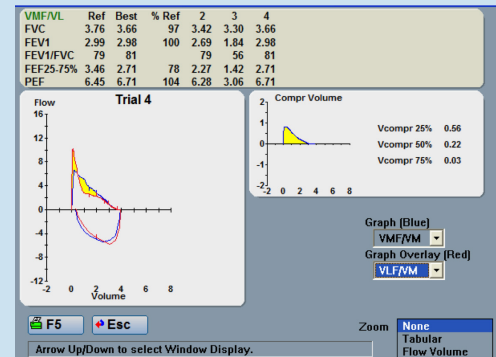
Optional isothermal lung volume standard



Vmax V62W wide body cabin

Compression-free flow volume loops

For patients with airflow limitations, flow rates at specific lung volume have been shown to be erroneous if volume is derived at the mouth only. Vmax compression-free flow/volume loops calculate the traditional flow/volume loop and simultaneously measures the total flow/volume loop by including the compression volume as a function of the cabin volume displaced by the chest movement. This is an excellent indicator of patient effort not discernible with traditional flow/volume loops.



Cardiopulmonary exercise testing

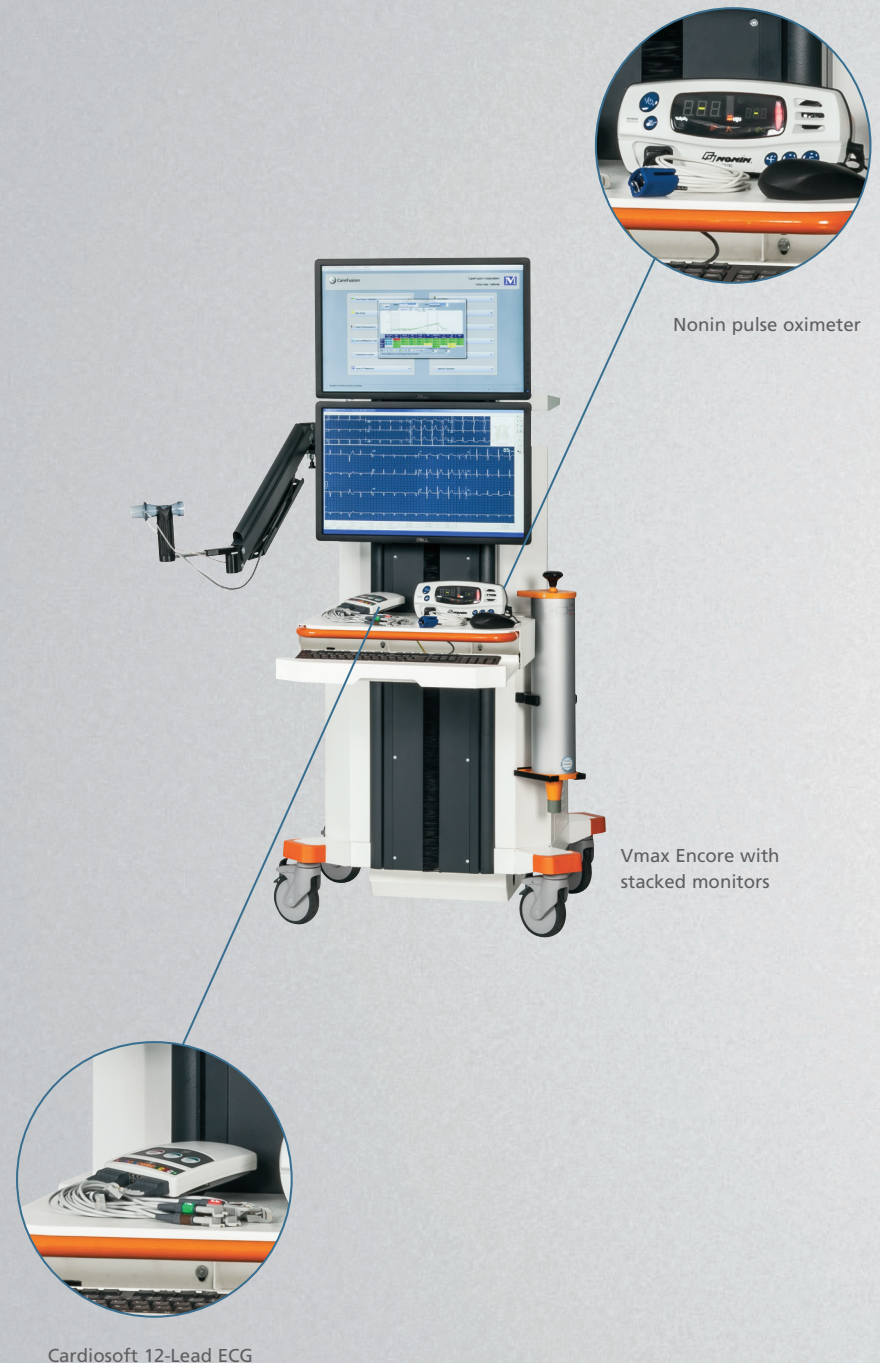
The Vmax Encore system helps increase your capabilities by acquiring data via breath-by-breath, mixing chamber and dilution modes. Key features include:

- Interface options to improve testing comfort and quality.
- Graphic overlay for up to four patients' statuses for training and rehabilitation.
- Built-in PhysioCal for instrument performance verification and test quality.
- Customizable exercise interpretation.
- Automatic metabolic slope calculation exercise-response quantification.
- Simultaneous exercise diffusing capacity and exercise tidal breathing flow/volume loops.
- Eight-channel analog input and output for flow, volume and gas concentrations and device integration (e.g., pulse oximeter).
- Spreadsheet-style automatic color coding and real time or post-test data entry.

Energy expenditure

The Vmax Encore Metabolic Cart provides highly accurate resting energy expenditure (REE) and substrate metabolism test data on patients varying from healthy ambulatory athletes to critical ventilator patients. Key features include:

- Mixing chamber or breath-by-breath technology to determine REE.
- Ventilator bias-flow VO_2 and VCO_2 calculation with simple, trouble-free patient interface.
- Real-time steady state notifications that automatically calculate steady state conditions (up to four levels).
- Substrate partitioning and computer-assisted interpretations.
- Pressure-corrected gas sample lines.



Nonin pulse oximeter

Vmax Encore with stacked monitors

Cardiosoft 12-Lead ECG



Vmax Encore with ICU cart



Vmax Encore with horizontal monitors



Tango® automated blood pressure screen



VIAprint™ bike



Trackmaster TMX428CP treadmill



Lode Corival adult and pediatric cardiopulmonary exercise device

Vmax Encore system software

Your data is an important aspect of your system, and the Vmax Encore system has a solution to match your particular lab needs. For example, our SQL server database solution yields extensive data management in a network environment and provides data access. The Vmax Encore system offers an integrated solution that:

- Offers a paperless diagnostic lab solution.
- Reviews, reports and provides quick data trends from almost any location.
- Maximizes efficiency in the interpretation process.
- Features seamless HL-7 message integration with the HIS/EMR using a bidirectional single click sign and send.
- Offers active directory compatibility.

1. As patient records move through your workflow, their status icon automatically changes color.

Date	Time	Last Name	First Name	ID	HIS Visit ID	HIS Order ID	Status
11/16/2013	09:24AM	Spungen	Steve	007			Testing
11/16/2013	08:58AM	Spungen	Steve	007			Testing Complete
Vmax <PFT: Single Page>, 12/10/2013 09:13AM							
11/17/2013	12:02PM	Test	Rehana	02041981			In Review
Vmax <Spirometry Report>, 12/10/2013 09:14AM							
11/17/2013	09:05AM	Lanier	Larry	jt1334			Testing Complete
Vmax <PFT Report: Complete>, 12/10/2013 09:14AM							
11/16/2013	01:36PM	Roxas	John	04241989			Testing Complete
Vmax <Spirometry Report>, 12/10/2013 09:16AM							
11/16/2013	11:48AM	Buan	James	1234			Testing Complete
Vmax <Spirometry Report>, 12/10/2013 09:17AM							
11/15/2013	02:53PM	aarc4	aarc4	aarc4			Final
Vmax <PFT Report: Complete> Signed, 12/10/2013 09:34AM							
11/11/2013	10:58AM	AARC3	AARC3	AARC3			Corrected
Vmax <Spirometry Report> Signed, 12/10/2013 09:35AM							

2. The Vmax Encore system with SentrySuite software allows quick filtering of the SQL database and easily identifies patients to be reviewed. To filter information about a specific patient, click the filter button on the top left.

The filter form includes the following fields and options:

- Filter** (button)
- Today** (date)
- 05/21/2013** (date)
- 12/10/2013** (date)
- Day** (radio button)
- Week** (radio button)
- Month** (radio button)
- Filter by date**
- ID** (text input)
- HIS Visit ID** (text input)
- Last Name** (text input)
- First Name** (text input)
- Physician** (dropdown menu)
- Ref. Physician** (dropdown menu)
- Technician** (dropdown menu)
- Location** (dropdown menu)
- Filter visit status**
- New**
- Testing**
- Testing Complete**
- Test Review**
- In Review**
- Final**
- Corrected**
- Filter detailed report status**
- Preliminary**
- Final**
- Correction**
- All** (dropdown menu)
- All** (dropdown menu)
- All** (dropdown menu)
- Clear Screen** (button)

3.

User-definable templates and macros speed the interpretation process.

CareFusion Corporation
Yorba Linda, California

PFT Lab Report

ID: 12345
 Name: DOREME, Jenny
 Age: 22 Height(in): 67
 Weight(lb): 195 Gender: Female
 Race: Hispanic
 Date: 04/19/13
 Technician: Jennifer
 Physician: Physician Name 4
 Diagnosis:

	Ref	Pre	% Ref	Post	% Ref	% Chg
Spirometry						
FVC Liters	4.31 (3.5 - 5.2)	3.97	92	3.92	91	-1
FEV1 Liters	3.46 (2.7 - 4.2)	3.30	95	3.20	92	-3
FEV1/FVC %	80 (68.8 - 91.3)	83		81		
FEV3 Liters		3.81		3.77		-1
FEF25-75% L/sec	3.89 (2.4 - 5.4)	3.62	93	3.19	82	-12
PEF L/sec	7.03 (4.2 - 9.9)	7.28	104	7.99	114	10
FET100% Sec		6.75		7.01		4
FIVC Liters	4.31 (3.3 - 5.3)	3.81	88	3.68	85	-3
FVL ECode		000000		000000		
MVV L/min	120 (87.7 - 153.3)	133	110			
f BPM		95				
MVV ECode		001000				
Lung Volumes						
TLC Liters	5.79 (5.0 - 6.6)	(4.93)	(85)			
VC Liters	4.31 (3.3 - 5.3)	3.97	92			
IC Liters	2.81 (2.4 - 3.3)	2.80	99			
FRC N2 Liters	2.80 (1.9 - 3.8)	2.13	76			
ERV Liters	1.41 (1.2 - 1.6)	(0.75)	(53)			
RV Liters	1.75 (1.0 - 2.5)	(0.97)	(55)			
RV/TLC %	28 (16.0 - 39.5)	20				
LVol ECode		000000				
Diffusing Capacity						
DLCO mL/mmHg/min	28.8 (20.5 - 37.1)	22.1	77			
DL Adj mL/mmHg/min	28.8 (20.5 - 37.1)	22.1	77			
DLCO/VA mL/mmHg/min/L	4.77 (2.9 - 6.6)	5.04	106			
DLVA Adj mL/mmHg/min/L		5.04				
VA Liters		4.39				
IVC Liters		3.50				
DLCO ECode		0000				

4.

Digital signature capability permits digital signing of patient record and data movement to your EMR as preliminary, final or corrected. After digital signing, a proof of electronic signature screen appears.


CardioPulmonary Exercise Graphs: 9-Plot

Name: EXAMPLE, EXERCISE
 Date: 05/10/07
 Age: 12

ID: CPX
 Height(in): 68
 Weight(kg): 59.1

The above screens display the complete library of pulmonary function, CPET and metabolic testing reports.



 **WARNING:** U.S. Federal Law restricts this device to sale by or on the order of a physician.

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