

VenTest 800 Series

High-performance gas flow analyzers for ventilator measurement and calibration.

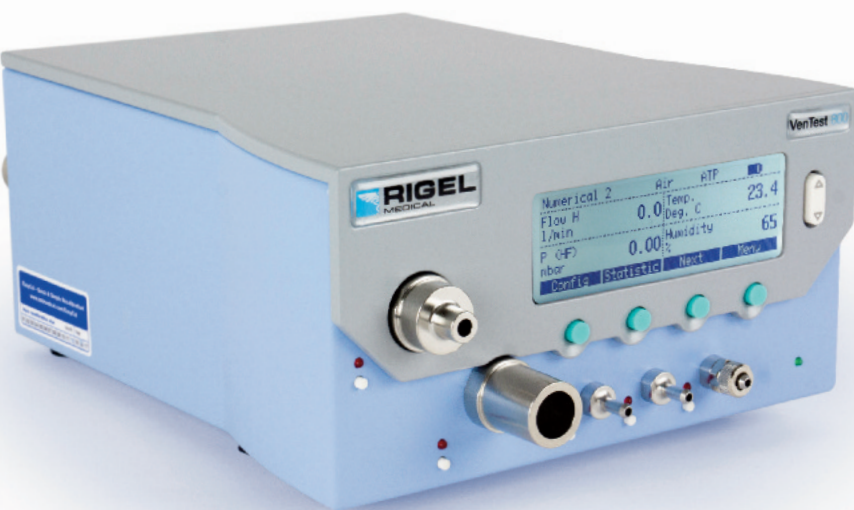
- ▶ **VenTest 800**
The standard model for universal applications.
- ▶ **VenTest 810 VAC**
Includes an additional sensor for vacuum measurements up to +/-1 bar.
- ▶ **VenTest 820 LOW**
Includes an additional sensor measuring minimal pressures up to 5 mbar.

Measuring your pneumatic equipment for reliability and precision with a dependable calibration tool is critical in avoiding fatal errors. Precision and reliability are exactly what the VenTest Series provides.

The VenTest measures flow, pressure, temperature, humidity and O₂ concentrations bi-directionally. The adult, pediatric and high-frequency ventilation measuring modes make the VenTest the ideal calibration tool for all ventilators, anesthesia machines and spirometers.

The VenTest distinguishes itself from other calibration tools by combining a simple, intuitive multilingual user interface with the most precise sensor technology.

With the push of a button, all measured values can be stored directly on the VenTest and later retrieved for documentation purposes. Optional FlowLab™ software provides a simple and useful tool to analyze all ventilation parameters including real time flow / pressure curves, functional zoom and certification papers.



Key Features

- All-in-one analyzer
- Measures and calculates all common respiratory parameters
- Compatible with gas standards and gas types
- Built-in data storage with optional software for total traceability
- USB, RS-232 and external trigger interface
- Portable with battery operation
- Instant gas concentration measurements with optional MultiGasAnalyser™ OR-703

Ventilator Analysis Test Functions

- Bidirectional flow
- High and low pressure
- Differential and barometric pressure
- Oxygen concentration
- Temperature
- Dew point
- 7 anesthetic gas concentrations (with MultiGasAnalyser™ OR-703)
- Respiratory parameters including; rate, time T_i, T_e, I:E ratio, T_i:T_{total} ratio, breadth volumes V_t, V_te, minute volumes V_i, V_e, pressure P_{peak}, P_{mean}, PEEP, P_{plateau}, Peak flow, Compliance and Adult, pediatric and HFO trigger

End User Types

- Biomed engineers involved in the maintenance of ventilators and anesthetic machines
- End of production line performance verification and calibration of ventilators and anesthetic machines
- After repair calibration and performance verification of ventilators and anesthetic machines

▶ **All-in-one analyzer**

The all-in-one adult, paediatric and high-frequency ventilation measuring modes make the VenTest the ideal calibration tool for all ventilators, anesthesia machines and spirometers.

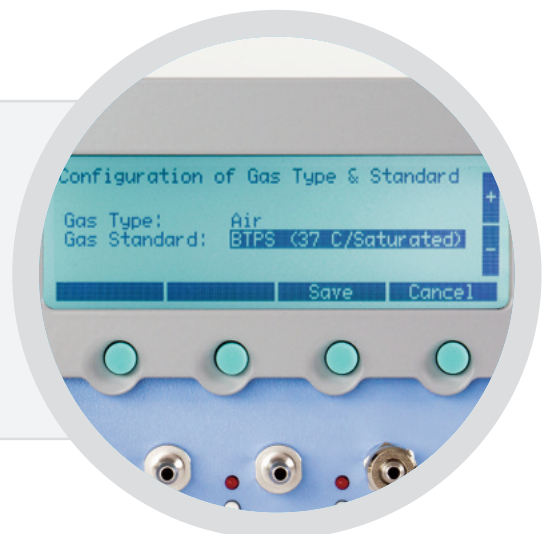


◀ **Measures and calculates all common respiratory parameters**

Flow, volume, pressure, oxygen, temperature, humidity (measured) and Vti, Vte, Vi, Ve, Ti, Te, Ti/Ttotal, Ppeak, Pmean, I:E, PEEP, Rate, PF Insp., PF Exp., Cstat, Pplateau and Delta P (calculated).

▶ **Compatible with gas standards and gas types**

Built-in compatibility for measuring ventilator performance in 13 gas standards and 10 gas types such as: Air, O₂, N₂O, He, N₂, CO₂ and Mixed: Air/O₂, N₂O/O₂, He/O₂.





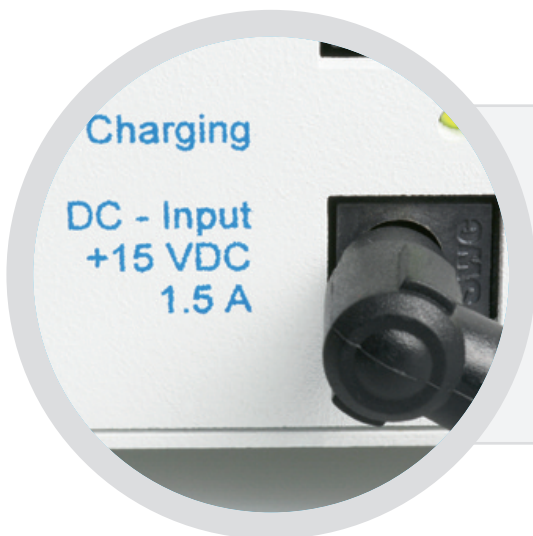
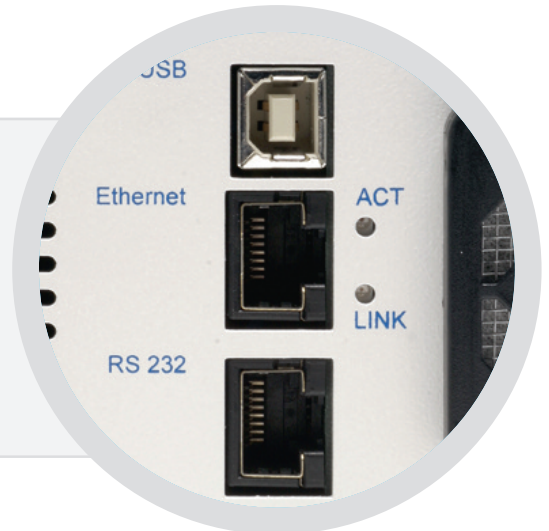
◀ **Built-in data storage with optional software for total traceability**

The VenTest has an internal memory that allows you to store up to 10 records, each containing up to 16 measurement values, eliminating the risk of manual data capture error and the hassle of paperwork.

When used with optional FlowLab™ software, over 100 hours of valuable performance information can be stored for total traceability and full analysis of ventilator performance.

▶ **USB, RS-232 and external trigger interface**

The VenTest communicates with your test software and ventilator to improve automation, increase traceability and standardize the process of testing ventilators.



► **Instant gas concentration measurements with optional MultiGasAnalyser™ OR-703**

The MultiGasAnalyser™ OR-703 provides a complete in-line, real-time monitoring system with unique versatility and design. When testing the performance and accuracy of anesthesia delivery and monitoring systems or CO2 monitoring devices, the sensor proves its absolute reliability.



VenTest 800 Series Accessories

Standard Accessories (supplied with VenTest Series)

VenTest adapter set	The adapter set assists in connecting the test object to the VenTest. The smallest possible dead space, as well as minor differences in the cross-section dimension of the flow current help increase measurement accuracy. This adapter set is included, free of charge, in your VenTest purchase.
VenTest carrying case	The VenTest case provides protection and order at work. This robust case includes storage space for your VenTest, adapter set, bacteria filter, power & USB cord, FlowLab™ software CD and user manual.

Optional Accessories

MultiGasAnalyser™ OR-703	The MultiGasAnalyser™ OR-703 measures all anesthesia and breathing gases and is the smallest multi-gas sensor in the world. It includes the most modern Microsystems technology and has a direct data interface with the VenTest. Key features include complete data collection and test reports.
SmartLung™ Adult & SmartLung™ Infant test lungs	The most intelligent and cost-effective test lungs that safely tests ventilators and anesthesia machines for function and precision. Variable patient parameters such as resistance, compliance or airway leakage can all be adjusted independently. The SmartLung™ is also extremely handy and user-friendly.

FlowLab™

FlowLab™ is the ideal software package. Its uniqueness is reflected in the simplicity of its menu.

Easy navigation using a mouse, allows you to select your preferred display mode (panels, trending or numeric). The user-configured test reports also allow all data to be conveniently collected.

Test Report

- Test report printouts with one click
- User-defined configuration
- Logo insertion available
- VenTest data automatically retrieved
- Various input options for each tested object
- Unique control number for each report

Panels

- Displayed in time-relation or as a loop
- Various cursors measure the curves
- Unique trigger used to display real-time curves in single shot, norm or auto mode
- User-defined layout and colors
- Option of setting a title, printing and saving
- Simultaneous display of up to 6 different curves

Trending

- Up to 100 hours of data logging
- User-defined trending interval
- Up to 10 values simultaneously
- Data export to Excel, etc.
- User-defined layout and colors
- Option of setting a title, printing and saving
- Automatic file size calculation

Numeric

- All measurements displayed on one page or combined with panels
- User-defined layout and colors
- Statistical data including mean, max and min for each value
- Input of target value with tolerances
- Automatic verification
- Up to 20 values displayed simultaneously

Minimum System Requirements

- Intel ® Pentium ® III 800MHz (P4 1200MHz recommended)
- Microsoft ® Windows ® 98, Me, 2000, XP, Vista, 7 (32 bit / 64 bit), 8.1 and 10
- Microsoft ® Internet Explorer 5.01 or higher
- 128MB RAM (512MB recommended)
- 160MB free space on the HD (full installation)
- CD-ROM drive
- Display 800 x 600 (1024 x 768 recommended)



VenTest Series Technical Specifications

			800	810	820		
Flow & Pressure Measurements		Range	Accuracy				
Flow	Measuring Direction	Bidirectional		■	■	■	
	Temperature Compensated	Yes		■	■	■	
	Pressure Compensated	Yes		■	■	■	
	Humidity Compensated	Yes		■	■	■	
	O ₂ Compensated	Yes		■	■	■	
	High	± 300 L/min	± 1.75%* or ± 0.1L/min**		■	■	■
	Low	± 20L/min	± 1.75%* or ± 0.04L/min**		■	■	■
Pressure	High	0 - 10bar	± 1%* or ± 10mbar**		■	■	■
	Average	± 150mbar	± 0.75%* or ± 0.1mbar**		Difference	Relative	Relative
	Low	0 - 5mbar	± 1%* or ± 0.01mbar**				■
	High in Flow Canal	0 - 150mbar	± 0.75%* or ± 0.1mbar**		■	■	■
	Barometer	0 - 1150mbar (abs)	± 1%* or ± 5mbar**		■	■	■
	Vacuum Pressure	± 1000mbar	± 0.5%* or ± 2mbar**			■	
Measuring Unit	Flow	L/min, L/s, cfm, mL/min, mL/s		■	■	■	
	Pressure	bar, mbar, cmH ₂ O, inH ₂ O, Torr, inHg, hPa, kPa, mmHg, PSI		■	■	■	
Additional Measuring Values		Range	Accuracy				
Oxygen	Concentration	0 - 100%	±1% O ₂ **		■	■	■
	Pressure Compensated	Yes		■	■	■	
Temperature	High in Flow Canal	0 - 50°C	± 1.75%* or ± 0.5°C		■	■	■
Dew Point	High in Flow Canal	-10 - 50°C	± 2%* or ± 1°C		■	■	■
Humidity	High in Flow Canal	0 - 100%	± 3%**		■	■	■
CO ₂ , N ₂ O, HAL, ISO, ENF, SEV, DES	Concentration	See MultiGasAnalyser™ OR-703 specification for details		With OR-703	With OR-703	With OR-703	
Gas Types	Air, Air/O ₂ , N ₂ O/O ₂ , Heliox (21% O ₂) He/O ₂ , N ₂ , CO ₂ , customized gas types			■	■	■	
Gas Standardisation	ATP, ATPD, ATPS, AP21, STP, STPH, BTPS, BTPS-A, BTPD, BTPD-A, 0/1013, 20/981, 15/1013, 25/991, 20/1013, NTPD, NTPS			■	■	■	
Respiratory Parameters ¹⁾		Range	Accuracy				
Rate		1 - 1000bpm	±1bpm or ±2.5%**		■	■	■
Time	T _I , T _E	0.05 - 60s	±0.02s		■	■	■
I:E Ratio		1:300 - 300:1	±2.5%		■	■	■
Ti/Ttotal		0 - 100%	±5%		■	■	■
Breath Volumes	V _{ti} , V _{te} (@FlowLow)	± 10L	±1.75% or ±0.10mL (>2.4L/min)		■	■	■
	V _{ti} , V _{te} (@FlowHigh)	± 10L	±1.75% or ±0.20mL (>6.0L/min)		■	■	■
Minute Volumes	V _i , V _e	0 - 300L/min	±2.5%*		■	■	■
Pressure	P _{peak} , P _{mean} , PEEP, P _{plateau} , Delta P	0 - 150mbar	±0.75%* or ±0.1mbar**		■	■	■
Peakflow	Peakflow Insp./Exp.	± 300L/min	±1.75%* or ±0.1L/min**		■	■	■
Compliance	C _{stat}	0 - 1000mL/mbar	±3%* or ±1mL/mbar**		■	■	■
Trigger		Adult, Pediatric, HFO Adjustable on flow or pressure curves with user-defined limits.		■	■	■	

*Tolerance related to the measured value }
 **Absolute tolerance } The greater tolerance is valid
 ***Non-condensing }

¹⁾Tolerance related to the optimal calibration of the trigger.
 Subject to technical changes.

MultiGasAnalyser™ OR-703 Specification

Measurements	Range	Accuracy
CO ₂	0 - 10%	± (0.2% ABS + 2% REL)
	10 - 20%	± (0.3% ABS + 4% REL)
N ₂ O	0 - 100%	± (2% ABS + 2% REL)
HAL, ISO, ENF	0 - 8%	± (0.15% ABS + 5% REL)
	8 - 12%	± (0.2% ABS + 10% REL)
SEV	0 - 10%	± (0.15% ABS + 5% REL)
	10 - 15%	± (0.2% ABS + 10% REL)
DES	0 - 22%	± (0.15% ABS + 5% REL)
	22 - 25%	± (0.2% ABS + 10% REL)
Response Time	CO ₂ <90ms, N ₂ O, AA <300ms, O ₂ <300ms	
Monitoring	Numerical data available with the VenTest	
	Numerical data and real-time curves available with FlowLab™ software	
	Interface	Through RS-232 port
Physical Data	Weight	<30g (excluding cable)
	Size	3.70 x 2.7 x 2.5cm (1.45 x 1.1 x 0.9")
Environmental Data	Operating Temperature	10 – 40°C
	Storage Temperature	-20 – 50°C
	Humidity	10 – 95%, non-condensing
	Atmospheric Pressure	700 – 1200mbar (3048m)
Compliance and Approvals	CE marked according to the 93/42/EEC MDD	
	ISO 11196:1997, EN 864:1996, EN 12598:1999, ISO/DIN 21647:2003	
	ISO 7767, ASTM-F 1452-92, ASTM-F 1456-92 and ASTM-F 1462-93	

VenTest Series General Specifications

Electrical & Physical Data

AC Input	90 - 260VAC, 50-60Hz
Battery (Lead Rechargeable Battery)	3 hrs (with OR-703 2 hrs)
Power Consumption	23VA
Weight	3.7kg / 8lbs
Dimensions (W x D x H)	22 x 25 x 12cm / 7 x 10 x 5"

Data Storage	All parameters (measured as well as respiratory values)
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Display

Graphic Display	Intuitive user interface with numerical measuring values, statistics, volume trigger configuration, gas type selection and calibration menus.
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RT-200 Emulation Mode

Simulates RT-200 style commands over the RS-232 interface.

Communication Interfaces

USB for Windows Software FlowLab™, RS-232 for individual communication, TTL for external trigger and TSI4000 Protocol.

Conditions

Ambient Temperature	15 - 40°C (59 - 104°F)
Humidity	10% - 90% RH not condensing
Air Pressure	700 - 1060 mbar

Storage and Transport

Temperature	-10 - 60 °C (14 - 140°F)
Humidity	5 - 95% RH

Approvals	CE, CSA
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Service & Warranty

VenTest comes with a standard 12 month warranty.

Standard Accessories (Supplied with VenTest)

Adapter Set
Carry Case

Optional Accessories available

MultiGasAnalyser™ OR-703 (800A942)
SmartLung™ Adult (800A948)
SmartLung™ Infant (800A950)
FlowLab™ (800A953)

Optional Accessory kits available

Standard Kit Contains:
VenTest 800, 810 or 820 unit
SmartLung™ Adult
FlowLab™ software

Elite Kit Contains:
VenTest 800, 810 or 820 unit
MultiGasAnalyser™ OR-703
SmartLung™ Adult
FlowLab™ software

Part Numbers

VenTest 800	800A9311
VenTest 810	800A9321
VenTest 820	800A9331
VenTest 800 Standard kit	800A9251
VenTest 810 Standard kit	800A9261
VenTest 820 Standard kit	800A9271
VenTest 800 Elite kit	800A9281
VenTest 810 Elite kit	800A9291
VenTest 820 Elite kit	800A9301



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