

# Technical data

## VT900A + VAPOR

The Fluke Biomedical VT900A + VAPOR is designed to efficiently and reliably perform a full anesthesia machine PM, from ventilators to vaporizers.

### One Solution

VT900A + VAPOR is a comprehensive test setup that can be used to test anesthesia machine ventilators and vaporizers. All flow, concentration and pressure parameters are accurately measured without any additional equipment, allowing you to lighten your load and simplify your test procedure. Calibration and servicing is made easy with one manufacturer for all anesthesia test equipment. Streamline anesthesia machine testing with one test setup to meet all your needs.

### Auto-detection to Help Ensure Patient Safety

VT900A + VAPOR automatically detects and identifies CO<sub>2</sub>, N<sub>2</sub>O, sevoflurane, isoflurane, desflurane, halothane and enflurane. Two agents can be displayed simultaneously to comprehensively analyze any anesthesia flow stream so that only one agent is being delivered. Automatic agent identification helps enhance patient safety by eliminating the need for user input and providing a means to test interlock systems and vaporizer contents. Keep patient safety the priority by testing anesthesia machines with equipment you can trust.



### Key benefits and features

- Streamline your testing procedure by performing a complete anesthesia machine PM with one test setup
- Avoid confusion with auto-detection of anesthetic agents and color-matched gas identification
- Reduce bulk and improve ease of transport with a convenient carrying case for the lightweight accessory and gas flow module
- Operate on-the-go with durable, robust design
- Simplify calibration and servicing with one manufacturer for all anesthesia test equipment
- 7-inch color touch screen, quick-connect fitting and complete anesthesia hosing accessory kit
- Confidently test with accuracy that meets vaporizer manufacturer recommendations
- Enhance patient safety with automatic detection and measurement of CO<sub>2</sub>, N<sub>2</sub>O and five commonly used anesthetic agents



## Easy-to-Use

VAPOR seamlessly integrates with the VT900A test system, allowing you to quickly and easily transition from ventilator to vaporizer testing. Set up test procedures easily and read results from up to 6' (1.8m) away with the 7" (17.8 cm) touchscreen display. Auto detection and color-matched agent identification. Intuitive user interface and simple equipment setup. Anesthesia testing made easy.

## Reliable Testing Anywhere

VT900A + VAPOR is a versatile, portable test solution equipped for use in a wide range of environments. Thorough drop testing and a 5-hour (minimum) battery life help it perform during rigorous field service. With best-in-class temperature, pressure, and humidity operating ranges and a convenient carrying case, VT900A + VAPOR can go wherever you do, continuing to perform accurate measurements that meet vaporizer manufacturer recommendations. Trust your results no matter where you test.

## Specifications

Complete and up-to-date specifications, including footnotes, found in the Safety Instructions.

Features	
Weight	0.5 kg
Measured Gases	CO <sub>2</sub> , N <sub>2</sub> O, HAL, ISO, ENF, SEV, DES
Gas Corrections	Pressure and temperature
Size	191 x 96 x 57 mm
Interface	RS-232
Measurement Technology	NDIR side stream
Warmup Time ISO, full spec	45 sec / 10 minutes
Measurement Time	< 20 sec
Concentration (full accuracy*)	
CO <sub>2</sub> % ABS range, accuracy	0-1, 0.1
	1-5, 0.2
	5-7, 0.3
	7-10, 0.5
	> 10, Unspecified
N <sub>2</sub> O % ABS range, accuracy	0-20, 2
	20-100, 3
HAL % ABS range, accuracy	0-5, 0.2 + 15 of gas level
	> 5, Unspecified
SEV % ABS range, accuracy	0-1, 0.15
	1-5, 0.2
	5-8, 0.4
	> 8, Unspecified
DES % ABS range, accuracy	0-1, 0.15
	1-5, 0.2
	5-10, 0.4
	10-15, 0.6
	15-18, 1
ISO % ABS range, accuracy	> 18, Unspecified
	0-1, 0.15
	1-5, 0.2
ENF % ABS range, accuracy	> 5, Unspecified
	0-1, 0.15
	1-5, 0.2
	> 5, Unspecified
Environmental	
Operating temperature	10-40 °C
Operating humidity	10-90%

\* warm-up accuracy is lower than full accuracy

Features	
Battery life hours	8 hrs
Charge time in hours	5 hrs, typical
Memory	internal memory
Connection type	USB, Micro-B device port
Weight	3.6 lb (1.6 kg)
Display	7 in (17.8 cm)
Single full-range channel	✓
Ultra-low flow ports	±750 ml/min
Ultra-low pressure port	0 to 10 mbar
Flow	
Full range flow channel (includes both low and high flow, flow specifications are with laminar flow input)	
Range	0 to ±200 slpm
Accuracy	±2.0% of rdg or 0.04 slpm
Range	200 to 300 slpm, -200 to -300 slpm, -22 to -14 slpm, +7.5 to +9.5 slpm
Accuracy	±2.5% of rdg
Ultra-low flow channel	
Range	±750 ml/min
Accuracy (air)	±1.7 % or 0.01 slpm
Volume	
Range	±100 l
Accuracy	±2.0 % or 0.02 l
Pressure	
High pressure	
Range	-0.8 to 10 bar
Accuracy	±1 % or ±0.007 bar
Differential low pressure	
Range	±160 mbar
Accuracy	±0.5 % or ±0.1 mbar
Ultra-low pressure	
Range	0 to 10 mbar
Accuracy	±1 % or ±0.01 mbar
Airway pressure	
Range	±160 mbar
Accuracy	±0.5 % or ±0.1 mbar
Barometric pressure	
Range	550 to 1240 mbar
Accuracy	±1 % or ±5 mbar
Other	
Temperature	
Range	0 to 50 °C
Accuracy	±0.5 °C
Resolution	0.1 °C
Humidity	
Range	0 to 100 % RH
Accuracy	±3 % RH (20 to 80 % RH) ±5 % RH (20< or >80 % RH)
Oxygen	
Range	0 to 100 %
Accuracy	±1 %

Breath parameters	
Inspiratory tidal volume range	0 to 60 l
Inspiratory tidal volume accuracy	±2.0 % or 5 ml
Expiratory tidal volume range	0 to 60 l
Expiratory tidal volume accuracy	±2.0 % or 5 ml
Minute volume range	0 to 100 l
Minute volume accuracy	±2.0 % or 5 ml
Breath rate range	1 to 150 bpm
Breath rate accuracy	±1 %
Breath rate range	150 to 1500 bpm
Breath rate accuracy	±2 %
Inspiratory to expiratory time ratio (I:E) range	1:300 to 300:1
Inspiratory to expiratory time ratio (I:E) accuracy	±2 % or 0.1
Peak inspiratory pressure (PIP) range	±160 mbar
Peak inspiratory pressure (PIP) accuracy	±0.75 % or 0.1 mbar
Inspiratory pause pressure range	±160 mbar
Inspiratory pause pressure	±0.75 % or 0.1 mbar
Mean airway pressure range	±160 mbar
Mean airway pressure accuracy	±0.75 % or 0.1 mbar
Positive end expiratory pressure (PEEP) range	±160 mbar
Positive end expiratory pressure (PEEP) accuracy	±0.75 % or 0.1 mbar
Lung compliance range	0 to 1000 ml/mbar
Lung compliance accuracy	±3 % or 0.1 ml/mbar
Inspiratory time range	0 to 60 s
Inspiratory time accuracy	0.02 s
Inspiratory hold time range	0 to 60 s
Inspiratory hold time accuracy	1 % or 0.1 s
Expiratory time range	0 to 90 s
Expiratory time accuracy	0.5 % or 0.01 s
Expiratory hold time range	0 to 90 s
Expiratory hold time accuracy	0.02 s
Peak expiratory flow range	±300 lpm
Peak expiratory flow accuracy	±2.0 % or 0.04 lpm
Peak inspiratory flow range	±300 lpm
Peak inspiratory flow accuracy	±2.0 % or 0.04 lpm
Environmental	
Operating temp	10 °C to 40 °C
Storage temp	-20 °C to 60 °C
Operating humidity	10 to 90 % non-condensing
Storage humidity	5 to 95 % non-condensing
Gas corrections	
ATP (ambient temp/pressure, actual humidity)	Air
ATPD (ambient temp/pressure, dry)	Nitrogen (N2)
ATPS (ambient temp/pressure, saturated)	Nitrous Oxide (N2O)
STP20 (20 °C temp/pressure 760 mmHg, actual humidity)	Carbon Dioxide (CO2)
STP21 (21 °C temp/pressure 760 mmHg, actual humidity)	Oxygen (O2)
STPD0 (0 °C temp/pressure 760 mmHg, dry)	Argon
STPD20 (20 °C temp/pressure 760 mmHg, dry)	Heliox (21 % O2, 79% He)
STP or STPD21 (21 °C temp/pressure 760 mmHg, dry)	Oxygen/Nitrogen
BTPS (body temp 37 °C/ambient pressure 760 mmHg, saturated)	Oxygen/Nitrous Oxide
BTPD (body temp 37 °C/ambient pressure 760 mmHg, dry)	Oxygen/Helium



## Ordering information

### Includes:

- Bacterial filter (1)
- 1.2 m (4 ft) silicon tubing (2)
- 22 mm ID x 22 mm ID tubing adapters (2)
- 22 mm OD x 22 mm OD tubing adapters (2)
- 15 mm OD x 22 mm OD tubing adapters (2)
- DISS hand tight nut/nipple to 6.4 mm (1/4 in) ID hose barb adapter (1)
- USB serial cable
- AC power adapter
- Detachable carrying handle
- Detachable shoulder strap
- Certificate of Calibration with test data
- VAPOR Anesthesia Tester



Accessory Tee

### Optional accessories

- ACCU LUNG Test Lung
- ACCU LUNG II Test Lung
- VESA Mounting system/test arm



## About Fluke Biomedical

Fluke Biomedical is the world's leading manufacturer of quality biomedical test and simulation products. In addition, Fluke Biomedical provides the latest medical imaging and oncology quality-assurance solutions for regulatory compliance. Highly credentialed and equipped with a NVLAP Lab Code 200566-0 accredited laboratory, Fluke Biomedical also offers the best in quality and customer service for all your equipment calibration needs.

Today, biomedical personnel must meet the increasing regulatory pressures, higher quality standards, and rapid technological growth, while performing their work faster and more efficiently than ever. Fluke Biomedical provides a diverse range of software and hardware tools to meet today's challenges.

## Fluke Biomedical regulatory commitment

As a medical test device manufacturer, we recognize and follow certain quality standards and certifications when developing our products. We are ISO 9001 and ISO 13485 medical device certified and our products are:

- CE Certified, where required
- NIST Traceable and Calibrated
- UL, CSA, ETL Certified, where required
- NRC Compliant, where required

## Fluke Biomedical

*We empower our everyday heroes to focus only on protecting lives.*

**Fluke Biomedical**  
6920 Seaway Boulevard  
Everett, WA 98203

**For more information, contact us at:**  
(800) 850-4608 or Fax (440) 349-2307  
sales@flukebiomedical.com  
flukebiomedical.com

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