Technical data

VT650 Gas Flow Analyzer

Accurately test gas flow equipment including ventilators with the all-in-one, portable Fluke Biomedical VT650 Gas Flow Analyzer.

Accurate

The VT650 Gas Flow Analyzer offers high accuracy* and reliability for testing gas flow and respiratory medical equipment, including neonatal, mechanical, and high-frequency ventilators. The single, full-range ±300 lpm air flow channel offers built-in oxygen, temperature and humidity measurements to streamline your testing procedure. Designed and tested to world renown Molbloc-L calibration specifications to help ensure traceability to global regulatory standards with measurements you can rely on.

Portable

Everything you need to perform tests is included in the VT650 – no extra modules or components are required. Weighing only 3.6 lb (1.6 kg), this compact, all-in-one device is highly portable. The snap-in carrying handle/shoulder strap, small unit size, and rugged design allow you to quickly and easily test on-the-go. With AC and DC power options and an 8-hour battery life, this tester is perfect for both clinical and field environments where AC power may not be available, but high accuracy* is needed.

*See specifications

Key features

- Avoid confusion and help ensure accuracy with one channel, full-range air flow functionality
- Streamline your testing procedure, reduce errors and quicken your test time with the ability to create customized test profiles
- Easily transport and store the lightweight 3.6 lb/1.6 kg), all-in-one device—no extra modules for different tests
- Have more control over your medical equipment testing by selecting your own trigger point with the external trigger input
- Quickly access menu options, interpret results and see measurements at a distance up to 6’ (1.8 m) with the large, easy-to-read 7” (17.8 cm) color touch screen
- Operate on-the-go all day with 8 hours of battery life
- Record and save data with the on-board memory
- Reduce testing time with built-in line sensors which automatically test humidity, temperature and oxygen while compensating for atmospheric pressure and environmental conditions

Easy-to-use

The VT650 has a large 7” (17.8 cm) touchscreen display, allowing you to view multiple measurements at once and quickly access menu options. Review results in real-time with either color graphs or numerical data. The global user interface makes operating this device straightforward and uncomplicated.

Traceable

The large onboard memory allows testing of multiple medical devices back-to-back without having to transfer data off between tests. Record and store test data, save time and streamline your testing needs by creating customized test profiles. When you are finished with your testing, simply save and transfer the data via USB to a PC and upload the test file to your CMMS for easy reporting.

Onboard memory and USB for easy data transfer and test file upload to your CMMS

7” (17.8 cm) color touchscreen showing real-time graphs and test data. Allows for customizable test profiles (by user, test type, or model) and data logging

Portable, light (3.6 lbs/1.6 kg) and rugged design with 8 hours of battery life

High and differential low-pressure ports. All sensors have the best accuracies on the market, reliably calibrated using Fluke Molbloc-L system

Full-range ±300 lpm air flow channel with built-in oxygen, humidity, and temperature measurements

Specifications

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	√
Flow	
Full range flow channel (includes both low and high flow, flow specifications are with laminar flow input) *only valid for Air, Nitrogen (N_2), and Oxygen (O_2)*	
Range	±300 slpm
Accuracy (air)	1.7 % or 0.04 slpm [1]
Volume	
Range	±100 l
Accuracy	±1.75 % 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
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	±2 %

Specifications Continued

Breath parameters	
Inspiratory tidal volume range	0 l to 60 l
Inspiratory tidal volume accuracy	±1.75 % or 0.005 l
Expiratory tidal volume range	0 l to 60 l
Expiratory tidal volume accuracy	±1.75 % or 0.005 l
Minute volume range	0 l to 100 l
Minute volume accuracy	±1.75 % or 0.005 l
Breath rate range	1 to 1500 bpm
Breath rate accuracy	1 % [2]
Breath rate range	150 to 1500 bpm
Breath rate accuracy	2 % [3]
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	±1.7 % or 0.04 lpm
Peak inspiratory flow range	±300 lpm
Peak inspiratory flow accuracy	±1.7 % or 0.04 lpm
Environmental	
Operating temp	10 °C to 40 °C
Storage temp	-20 °C to 60 °C [4]
Operating humidity	10 to 90 % non-condensing
Storage humidity	5 to 95 % non-condensing

Specifications Continued

Gas corrections
ATP (ambient temp/pressure, actual humidity)
ATPD (ambient temp/pressure, dry)
ATPS (ambient temp/pressure, saturated)
STP20 (20 °C temp/pressure 760 mmHg, actual humidity)
STP21 (21 °C temp/pressure 760 mmHg, actual humidity)
STPD0 (0 °C temp/pressure 760 mmHg, dry)
STPD20 (20 °C temp/pressure 760 mmHg, dry)
STP or STPD21 (21 °C temp/pressure 760 mmHg, dry)
BTPS (body temp 37 °C/ambient pressure 760 mmHg, saturated)
BTPD (body temp 37 °C/ambient pressure 760 mmHg, dry)

Gas types	
Air	
Nitrogen (N2)	
Nitrous Oxide (N2O)	
Carbon Dioxide (CO2)	
Oxygen (O2)	
Argon	
Heliox (21 % O2, 79% He)	
Oxygen/Nitrogen	
Oxygen/Nitrous Oxide	
Oxygen/Helium	

[1] ±2.5 % of rdg (-22 to -14 slpm, +7.5 to +9.5 slpm)

[2] Breath reading using flow, pressure and external trigger

[3] Breath reading using high frequency special test mode. External trigger cannot be used. Flow, pressure, and volume readings at high frequency are unspecified. Typically these readings meet normal frequency specifications.

[4] For storage temperatures below -15 °C or above +50 °C, remove the oxygen sensor.

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Ordering information

VT650 Gas Flow Analyzer

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 ID x 22 mm ID 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

Optional accessories

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

Fluke Biomedical offers two models of Gas Flow Analyzers. Be sure to check out the VT900A if you do more in-depth testing, or need high accuracy in ultra-low flow (±750 ml/min) and ultra-low pressure (0 to 10 mbar) ranges.

The VT900A has all of the features of the VT650 plus, higher accuracies and, additional ultra-low flow and ultra-low pressure ports. The VT900A is best-in-class and ideal for testing all types of ventilators, anesthesia machines, and more.

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.

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