Automated Filter Testers

Model 8587A
Laser Photometer

Duplicate NIOSH respirator and filter certification measurements in your laboratory.

TSI®

The New Model 8587A Laser Photometer

Back by popular demand, the 8587A maintains data continuity and plug-and-play compatibility with the original instrument.

Benefits

- Duplicate NIOSH certification testing
- Low maintenance–sheath air keeps optics clean
- Customize operation with your own control software
- Maintain data continuity with legacy 8587 measurements

Features

- Same photometer engine as used by NIOSH & US Army
- Signal correlates with aerosol mass concentration
- Stable 30mW laser light source
- Fit factors to 100,000
- Filter efficiency to 99.999 percent
- Internal valve switches between upstream and downstream samples
- Automatic gain selection
- Analog and digital output
- Manual or remote control via RS-232 or USB
- Critical orifice controls sample flow
- Fast (high flow rate) sample line purging
- Plug-and-play compatible with the original 8587 command language

Applications

- Respirator certification testing (fit testing)
- Filter certification testing
- Respirator design and development
- Filter design and development
- Aerosol laboratory research

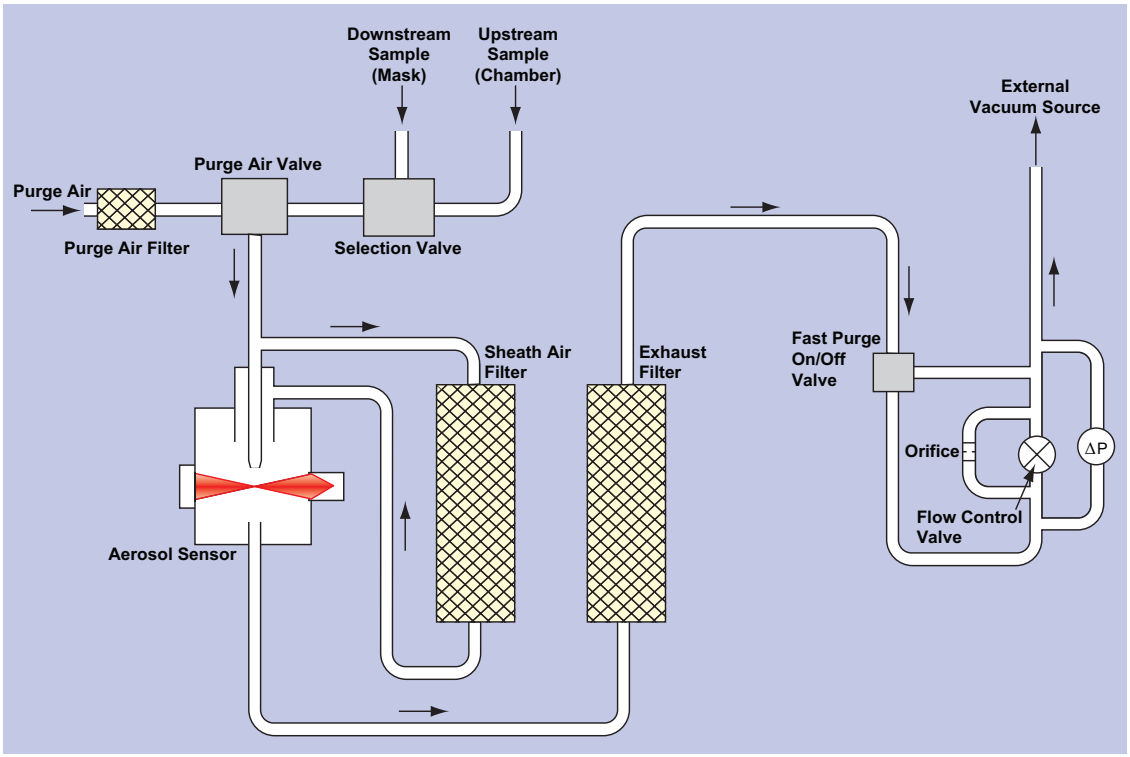
Background

Fifteen years ago, the U.S. Army asked TSI to develop an advanced-technology light scattering photometer to replace aging instruments incapable of measuring the high protection factors provided by newer gas mask designs. The result was the Model 8587 Laser Photometer which has now been in service for well over a decade.

The U.S. Army and other photometer owners asked TSI to develop a modern version of the 8587 that retains data continuity with the original photometer. Without data continuity, vast amounts of legacy research would not be directly comparable to new research.

Operation

Flow Schematic Model 8587A Laser Photometer



Respirator Certification Testing

The Model 8587A Laser Photometer uses the same reliable, robust, time-proven photometer engine as the original Model 8587 used by the US Army for gas mask development and by NIOSH for CBRN respirator certification testing. In fact, the 8587A is plug-and-play compatible with the original 8587. This means your laboratory can develop and test new respirator designs using the same measurement used for NIOSH certification testing.

Operation

The 8587A has a simple front panel keypad for manually switching between upstream sampling, purging and downstream sampling. It also has a digital photometer voltage display on the front panel, with the real-time analog voltage available via a back panel connector.

Most users will want to take advantage of the remote control features that allow precise test protocol control via an RS-232 or USB 1.1 interface. You can write your own software to control all aspects of testing, including sampling mode (i.e. upstream/purge/downstream), read voltage, reset voltage, query valve status, and to control all three valves individually. Example program code is included to help programmers get started using the simple ASCII command set.

Low Maintenance

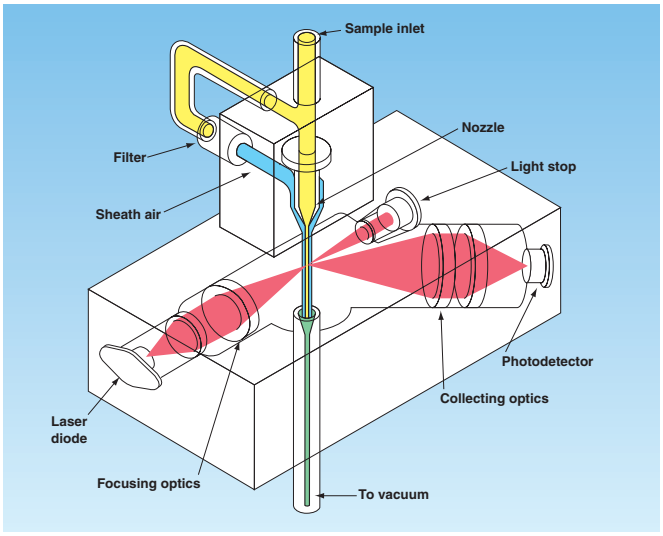
The optics are protected by filtered sheath air. Aerosols never come in contact with the lenses.

Filter Testing

The Model 8587A is perfect for testing the efficiency of particulate filters. In fact, the 8587A photometer engine is the same one used in the TSI Model 8130 Automated Filter Tester currently employed by NIOSH for 42CFR part 84 particulate filter certification. Integrated valves make switching between upstream, purge and downstream measurements simple using front panel or remote control.

Laboratory Applications

The 8587A is useful for a variety of aerosol research applications. It is a basic photometer with switching valves added to accommodate easy aerosol concentration ratio measurements or mass correlations with a wide variety of aerosols.



Specifications

Model 8587A Laser Photometer

Photometer	
Concentration Range	1.0 µg/m^3 to >200 mg/m^3 (0.000001 to 0.200 g/m^3)
Dynamic Range	Fit factors to 100,000; filter efficiency to 99.999 percent
Gain Selection	Automatic
Optics and Laser	
Light Source	30mW laser diode, 780 nm wavelength
Collection Angle	45 degrees
Lens Protection	Sheath air prevents aerosol from contacting optics
Flow Rate	
Sample	2.0 l/min (controlled with critical orifice)
Purge	Approx. 20 l/min (uncontrolled)
Instrument Control	
Manual	Front panel buttons
Remote	Computer control via RS-232 or USB 1.1
Size (W x H x D)	15 cm x 25 cm x 33 cm (6.25 in. x 10 in. x 13 in.)
Weight	6.4 kg (13.5 lb)
Vacuum Pump*	User-supplied vacuum source
Sampling	2.0 l/min @ 55 kPa (8 psi) vacuum
Purging	20 l/min @ 0 kPa (ambient atmospheric pressure)
Communications	
Analog Output	0 to 5 VDC
RS-232	9-pin D-type (DB9F) connector; ASCII; 1200bps or 115Kbps (selectable), N, 8, 1
USB 1.1	USB type B female connector
Power	100 to 240 VAC, 50/60 Hz (auto-sensing), 1.3 A, IEC 60320/C14 socket
Front Panel	
Display	16 character x 2 line LCD (backlit)
Control Buttons	Upstream, Purge, Downstream
Back Panel	On/Off switch • IEC 60320/C14 line cord socket • analog output female BNC connector • RS-232 connector (DB9F) • USB Type B female connector • 6.4 mm (0.25 in.) diameter upstream/downstream/vacuum ports
Software Provided	Documentation of 8587A ASCII command set (in Operation & Service Manual) • 8587A USB driver software for Windows XP/2000 • USB terminal emulation software for interactive control via USB port • C++ USB function library.

**Purge flow is the determining factor in selecting a vacuum pump. Most pumps that provide the needed purge flow at atmospheric pressure will have no difficulty providing the needed flow during sampling.*

To Order

Model 8587A Laser Photometer

Specify	*Description*
8587A	Laser Photometer, 115/230 VAC, 60/50 Hz
2610110	Vacuum pump for one photometer, 31 l/min max, 115 VAC, 60 Hz
1500135	Vacuum pump for one photometer, 25 l/min max, 230 VAC, 50 Hz
3033	Vacuum pump for two to four photometers, Up-to 60 l/min, 115/230 VAC, 60/50 Hz
4140	Airflow meter to verify supply and sample airflows
1980522	Model 8587A Laser Photometer manual
1083636	Filter maintenance kit for 8587A

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