Model 501-B

Smoke Detector Tester for
Calibrated Sensitivity Inspection Of Installed Detectors

Meets Current NFPA 72 Recommendations
For Calibrated Sensitivity Tests & Functional Tests
For Ionization or Photoelectric Detectors *(Duct, wall or ceiling-mounted)* even older larger size detectors
Adjustable Range: 0.3 to 4.0 %/ft
Proud to Say, “Made in the U.S.A.”

UL Listed
Stable Smoke
Harmless to Detectors
30 Seconds Per Test
Portable, Easy to Operate
Digital Display

**National Fire Alarm Code**
The National Fire Protection Association recommends periodic inspection and testing of smoke detectors at their installed locations as stated by the National Fire Alarm Code (NFPA 72 current).

The test includes a calibrated sensitivity test to assure that (1) each detector is within its listed sensitivity range, and (2) each detector would initiate an alarm when exposed to smoke of certain concentrations.

**The Gemini 501-B Testers**
The Gemini 501 Tester combines the above 2 objectives into a single and easy to perform test. The tester generates an adjustable amount of aerosol smoke between 0.3 and 4.0 %/ft obscuration to challenge the detector under test. During the test, the operator selects a smoke concentration level and directs the smoke through the hand-held wands and shroud to the detector at the ceiling.

If the concentration selected is below the sensitivity setting of the detector, the detector would not alarm. However, if the concentration is equal to or greater than the setting, the detector should alarm within 30 seconds.

The minimum amount of smoke that triggers the alarm is the sensitivity setting of the detector.

**Aerosol Smoke**
The tester produces a consistent and stable smoke from a refined mineral oil. The smoke particle sizes and size distribution resemble that of the smoke from the UL-268 Standard Smoke Box. Because of its small particle sizes, low concentration, and short exposure time, the test smoke is not harmful to the detectors or the operator.
UL Listing and Calibration
Prior to its approval for listing, the Underwriters laboratories (UL) evaluated to its satisfaction, the correlation of test results for detector sensitivity between the Gemini 501 Tester and the UL-268 Standard Smoke Box.

In production, each instrument is individually calibrated with a Particle Mass Monitor and Standard Reference Detectors. The instrument output is presented as mass concentration in mg/m³ and smoke obscuration in %/ft.

Model 501-B
This model includes a rechargeable 12 V Ni-Metal Hydride battery.

Specifications

<table>
<thead>
<tr>
<th>Aerosol Particle Size</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number median diameter</td>
<td>0.2 micrometer (μm)</td>
</tr>
<tr>
<td>Mass median diameter</td>
<td>0.45 μm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±5%</td>
</tr>
</tbody>
</table>

Generation Characteristics

<table>
<thead>
<tr>
<th>Test stream flow rate</th>
<th>60 L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration Range</td>
<td>0 - 45 mg/m³ (0 - 4 %/ft obscuration)</td>
</tr>
<tr>
<td>Reset, concentration</td>
<td>+/-4%</td>
</tr>
<tr>
<td>Type of Aerosol</td>
<td>RUDOL oil*</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>24 +/- 3 °C (75 +/- 5 °F)</td>
</tr>
</tbody>
</table>

Operating Temperature

<table>
<thead>
<tr>
<th>Mechanical Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions, overall</td>
<td>Approx. 9.5 x 6.5 x 7 in. (24.1 x 16.5 x 17.8 cm)</td>
</tr>
<tr>
<td>Weight, approximately</td>
<td>11 lb (5 kg) with battery</td>
</tr>
<tr>
<td>Hose length</td>
<td>5 ft. (1.5 m)</td>
</tr>
<tr>
<td>Oil Reservoir Volume</td>
<td>approx. 30 ml</td>
</tr>
</tbody>
</table>

Power Requirement

| 501-B                     | 12 V DC, 6.5 Amp-Hr Ni-MH Battery |

*RUDOL oil, an NF-grade white mineral oil, aromatics-free, saturated aliphatic hydrocarbons. Viscosity = 29 centistoke @ 40 °C. Specific gravity = 0.87 @ 25 °C. It conforms to the FDA-CFR 172.878 which allows for direct skin & food contact and is stabilized with Vitamin E for long shelf life. RUDOL is a registered trade mark of Witco Chemical Co.
Model 501-A & 501-B Testers

The Gemini 501 Tester combines the above 2 objectives into a single and easy to perform test. The tester generates an adjustable amount of aerosol smoke between 0.3 and 4.0 %/ft obscuration to challenge the detector under test. During the test the operator selects a smoke concentration level and directs the smoke through the hand held wands and shroud to the detector at the ceiling.

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Visit us on the web at http://www.geminiscientific.com
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In production, each instrument is individually calibrated with a Particle Mass Monitor and Standard Reference Detectors. The instrument output is presented as mass concentration in mg/m³ and smoke obscuration in %/ft.

**Model 501-A/BAT**
This model includes a 12 V DC Sealed Lead-Acid Gel Cell Rechargeable battery for both battery or AC operation.

**Inspection Service**

The Gemini Tester was designed with the inspection personnel in mind. It is a universal tester, suitable for all types and brands of detectors. Furthermore, it lets you test the detectors in place, without having to remove them from the ceiling.

Depending on the type of facilities, an experienced operator should be able to test 150 to 200 detectors per day.

**Maintenance**
The only regular maintenance needed is to change the vacuum filter element after 200-300 tests. A pint bottle of Rudol Liquid, a refined mineral oil, is sufficient for over 800 tests.

**Specifications**

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<td>+/−4%</td>
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<td>RUDOL oil*</td>
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<tr>
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<tr>
<td>Operating Temperature</td>
<td></td>
</tr>
<tr>
<td>Mechanical Characteristics</td>
<td></td>
</tr>
<tr>
<td>Dimensions, overall</td>
<td>16 x 11 x 10 in. (41 x 28 x 25 cm)</td>
</tr>
<tr>
<td>Weight, approximately</td>
<td>12 lb (5.4 kg) 18 lb (8.2 kg) with battery</td>
</tr>
<tr>
<td>Hose length</td>
<td>5 ft (1.5 m)</td>
</tr>
<tr>
<td>Oil Reservoir Volume</td>
<td>approx. 30 ml</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>115 V AC, 60 Hz, 3A</td>
</tr>
<tr>
<td>501-A/BAT, AC or battery</td>
<td>12 V DC, 7 Amp-Hr Lead-Acid Battery</td>
</tr>
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GEMINI 501 SERIES ANALYZERS FOR SMOKE DETECTORS

Why do so many companies choose the Gemini 501-A over other equipment for inspection and maintenance of smoke detector alarm systems?
Here are the reasons:

Gemini 501 is a UL-Listed Universal Tester

• Other instruments may be able to test only ceiling-mounted detectors, but Gemini 501 Tester is a truly universal instrument that can test any type, brand, or model of smoke detectors which include duct detectors, floor detectors (in computer rooms), wall-mounted and ceiling-mounted smoke detectors. Most of all, it takes much less time to perform the test than any other instruments.

• No need to own a test probe from every manufacturer.

Gemini 501 uses a Calibrated Sensitivity Test Method

• It uses a known and adjustable concentration of aerosol smoke for the test.

• It uses smoke with particles sizes comparable to the UL-268 Standard.

• It uses the up-to-date testing method recommended by the NFPA 72 National Fire Alarm Code (current ed.).

Gemini 501 tests All the Functional Parts of the Detector

• It measures the sensitivity (alarm point) of the whole alarm circuit.

• It checks blockage to smoke entrance.

Gemini 501 is Portable, Reliable, and Easy to Use

• Operator directs the smoke through a hose, wand, and cup to the detector at the ceiling. Tests take about 30 seconds and are harmless to the detector.

• The accuracy of the instrument is maintained by working reference standards traceable to the UL-268 Smoke Box.

About 3% of the installed detectors failed as the results of sensitivity shift, which is beyond the UL acceptable limits. The statistic is based on Fire Department inspections of over 10,000 detectors in 4 cities.
Now, Many states have adopted inspection procedures for critical facilities using calibrated sensitivity tests recommended by the current NFPA 72 National Fire Alarm Code.

1 Underwriters Laboratories
2 National Fire Protection Association
Partial List of Typical Users of Gemini 501 Analyzer for Smoke Detectors

Smoke Detector Manufacturers
- ADT Security Systems, Spokane, WA
- System Sensor, St. Charles, IL
- Cerberus Pyrotronics, Columbus, OH
- Simplex Time Recorder Co., Gardner, MA
- Johnson Controls, Milwaukee, WI

Universities
- Univ. of Wisconsin, Madison, WI
- Oklahoma State, Stillwater, OK
- Florida State Univ., Tallahassee, FL
- Univ. of California, Davis, CA
- Purdue Univ. West Lafayette, IN

Government Agencies
- Center for Fire Research, Gaithersb., MD
- Florida Dept. of Correction, Zephyr, FL
- Malmstron Air Force Base, MT
- Navy Public Work Cntr., Great Lake, IL
- Omaha Public School, Omaha, NE
- Michigan Dept. of Correction, Ionia, MI

Installation & Inspection Services
- Fire Master, Phoenix, AZ
- Honeywell, Inc., Salt Lake City, UT
- Edwards Co., Lakewood, CO
- Koorsen Protective Services, Fort Wyne, IN
- Landis & Straefa, Roanoke, VA
- Grinnell Fire Protection, Cincinnati, OH

Veterans Administration Medical Ctns.
- Most VA Hospitals Including:
  - V A Hospital, Altona, PA
  - V A Hospital, Augusta, GA
  - V A Hospital, Omaha, NE
  - V A Hospital, St. Louis, MO
  - V A Hospital, Charleston, SC

Industries
- Security Link, Orlando, FL
- The Boeing Co., Seattle, WA
- A T & T, New York, NY
- Arco Alaska Oil, Anchorage, AK
- Penn. Power & Light, Berwick, PA
- Walt Disney World, Lake Buena Vista, FL

Hospitals
- Kaiser Medical Center, Portland, OR
- Christ Hospital, Oak Lawn, IL
- Rhode Island Hosp., Providence, RI
- N. C. Baptist Hospital, Winston, NC
- Humana Women's Hospital, Tampa, FL

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1National Institute of standards and Technology
**Carry Case for Gemini 501-A & 501-A/BAT ONLY**


Constructed of light-weight, tough, wear-resistant fiberbilt material, aluminum tongue and groove closure with steel reinforced corners.

Size: 22"x16"x10"  
Color: Gray

**Carry Case for Gemini 501-B (can be used for 501-A & 501-A/BAT also)**

Put Detector Analyzer, Hose, Wand, Shroud, and accessories in a single carrying case. Foam interior for snug-fit protection of the Instrument. The case is watertight, airtight, dustproof, crushproof, and built tough! It is equipped with 2" hard rubber transport wheels and a retractable extension handle. Features include multiple fold down carrying handles, atmospheric pressure purge valve, integral wheels and comfort grip.

Inside Dimensions: 22 3/16" L x 17 1/8" W x 10 9/16" D  
Outside Dimensions: 24 9/16" L x 19 5/16" W x 11 15/16" D  
Color: Black

**Fold-up Instrument Carrier (Heavy Duty) for 501-A & 501-A/BAT ONLY**

Constructed of steel and particle board.  
Unfolded Size: 24"x16"x29" H  
Folded Size: 24"x10"x38" H  
Load Capacity: 170 LB.  
Wheels(2): 10"  
Casters(2): 4" swivel with lock  
Weight: 40 LB.

**Fold-up Instrument Carrier (Light Duty)**

Constructed of durable white-paint steel  
Unfolded Size: 24"x16"x29" H  
Folded Size: 24"x 3"x36" H  
Casters(4): 3" swivel, no lock  
Weight: 12 LB.

**Accessories Available**

A. Wall-mounted detectors testing adaptor for all models  
B. Hi-Reach kit (12 to 30 ft options available) Please call for details  
C. Tripod Stand for 501-B Tester  
D. Tripod Dolly (wheels) for 501-B Tester