

OPERATOR'S MANUAL

for

Air Operated Aerosol Generators

Models TDA-4B, TDA-4Blite & TDA-6C

Revision G



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Generator Description

ATI manufactures portable Laskin nozzle aerosol generators which produce a sub micron poly-dispersed oil mist aerosol in concentrations from 10 to 100 micrograms per liter (ug/l) at air flows from 50 to 8,100 cfm.

Aerosol generators and photometers are used to integrity test or locate leaks in high efficiency air filtration systems. Filter manufacturers use this equipment to scan ULPA and HEPA filters to verify they are free from manufacturing defects. Filter certifiers use this equipment to insure that filters were not damaged in shipping and have been installed properly, eliminating any leakage.

With the proper generator and photometer combination, filter deficiencies such as pinholes, thin spots, gasket leaks, frame leaks or seal problems can be quickly and quantifiably pinpointed and corrected thus protecting product and personnel.

The TDA-4B, TDA-4Blite & TDA-6C feature several improvements over preceding units including rugged stainless steel construction, larger fill ports, individual nozzle control, and a 3" standard sanitary flange outlet. An optional hose adapter, part number 9300100, is available for introducing the aerosol into positive pressure systems.

CAUTION

DO NOT EXCEED 100 psig INPUT PRESSURE

WARNING!

UNDER NO CIRCUMSTANCES SHOULD THE AEROSOL OUTLET BE COMPLETELY BLOCKED DURING OPERATION. BLOCKAGE OF THE OUTLET WILL CAUSE SEVERE DAMAGE TO THE UNIT AND POSSIBLE INJURY TO PERSONNEL!

TDA-4B Features

The TDA-4B is the latest design in rugged, lightweight Laskin nozzle generators from ATI. The TDA-4B is a small, compact aerosol generator that requires only a supply of clean, compressed air to create poly-dispersed sub micron oil aerosol.

The TDA-4B has 6 Laskin nozzles. When its total output at 20 psig is diluted by 810 cfm of air, the aerosol concentration is approximately 100-ug/liter. Three valves permit the unit to be operated with 1 to 6 nozzles, providing a wide range of aerosol concentrations.

The TDA-4B is recommended for testing systems with airflows of 8,100 cfm and lower. It is ideal for workstations, Negative Pressure Filtration Units, bio-safety cabinets, ceiling modules, small or portable cleanrooms, or HEPA filter units in installations where an adequate supply of clean, compressed air is readily available.

OPERATING INSTRUCTIONS TDA-4B AEROSOL GENERATOR (6 Laskin nozzle)

1. Unscrew LIQUID FILL cap located on top of cabinet and fill sight gauge to 3/4 full with desired liquid aerosol agent. Do not overfill. Refill when the level falls to the halfway point on the sight gauge.
2. Attach a source of clean, dry, compressed air to the filter/regulator air inlet. A shut-off valve (ball-type) is recommended to turn the air to the unit on and off.
3. Turn air on and adjust the filter/regulator control knob, accordingly. To lock this adjustment in, simply push down on control knob.
4. Varying aerosol output concentration.

1 Nozzle	Valve #1 ON Valve #2 OFF Valve #3 OFF
2 Nozzle	Valve #1 OFF Valve #2 ON Valve #3 OFF
3 Nozzle	Valve #1 OFF Valve #2 OFF Valve #3 ON
4 Nozzle	Valve #1 ON Valve #2 OFF Valve #3 ON
5 Nozzle	Valve #1 OFF Valve #2 ON Valve #3 ON
6 Nozzle	Valve #1 ON Valve #2 ON Valve #3 ON

NOTE: If more than 20 psig is used, the output concentration will increase and, conversely, if less than 20 psig is used, the output concentration will decrease. If using more than two (2) nozzles, upstream concentrations should be measured.

TDA-4Blite Features

The TDA-4Blite is a smaller, lower capacity version of the TDA-4B that still retains all the improved features. The TDA-4Blite was specifically designed for use in bio-safety cabinets. Its small size and low cost make it the ideal generator for bio-safety cabinet testing and HEPA filter vacuums.

The TDA-4Blite has 3 Laskin nozzles. Two valves permit the unit to operate with 1 to 3 nozzles to provide a wide range of aerosol concentrations.

OPERATING INSTRUCTIONS TDA-4Blite AEROSOL GENERATOR (3 Laskin nozzle)

1. Unscrew LIQUID FILL cap located on top of cabinet and fill sight gauge to 3/4 full with desired liquid aerosol agent. Do not overfill. Refill when the level falls to the halfway point on the sight gauge.
2. Attach a source of clean, dry, compressed air to the filter/regulator air inlet. A shut-off valve (ball-type) is recommended to turn the air to the unit on and off.
3. Turn air on and adjust the filter/regulator control knob, accordingly. To lock this adjustment in, simply push down on control knob.
4. Varying aerosol output concentration.

1 Nozzle	Valve #1 ON Valve #2 OFF
2 Nozzle	Valve #1 OFF Valve #2 ON
3 Nozzle	Valve #1 ON Valve # 2 ON

NOTE: If more than 20 psig is used, the output concentration will increase and, conversely, if less than 20 psig is used, the output concentration will decrease. **If using more than two (2) nozzles, upstream concentrations should be measured.**

TDA-4B Specifications

Aerosol Output Range: 50-8,100 cfm
Aerosol Concentration 100 ug/1@ *810
cfm
Aerosol Concentration 10 ug/1@ *8,100
cfm
Generator Type: 1 to 6 Laskin nozzles
Source Air: min 2.65 cfm/noz. @ 20 psig

Aerosol Type: Polydispersed (Cold)
Size: 10" L × 11" W × 9" H
(25cm L × 28cm W × 23cm H)
Weight-Pounds (lbs): 16 lbs.
Weight-Kilograms (kg): 7.3 kg
Electrical: (Not Required)

TDA-4Blite Specifications

Aerosol Output Range: 50-4,050 cfm
Aerosol Concentration 100 ug/1@ 405
cfm
Aerosol Concentration 10 ug/1@ 4,050
cfm
Generator Type: 1 to 3 Laskin nozzles
Source Air: min. 2.65 cfm/noz. @ 20 psig

Aerosol Type: Poly-dispersed (Cold)
Size: 10" L × 8" W × 9" H
(25cm L × 20cm W × 23cm H)
Weight-Pounds (lbs): 12 lbs.
Weight-Kilograms (kg): 5.5 kg
Electrical: (Not Required)

* Increased pressure results in increased aerosol concentration.

* . If using more than two (2) nozzles, upstream concentrations should be measured.

TDA-4B & TDA-4Blite Aerosol Output Calculation

These units include a total of either 3 or 6 Laskin nozzles incorporated into the cabinet. The aerosol concentration depends on the compressed air pressure and flow available for consumption by the nozzle. With 20 psig applied, each Laskin nozzle emits 75 slpm of air containing 5.10 mg/l of aerosol. When this aerosol is diluted with 135 cfm of air, the aerosol concentration becomes approximately 100 micrograms per liter. The equation below is for purposes of calculating the aerosol output in micrograms per liter (ug/l) when 20 psig is applied to the nozzle jets.

$$13,500 \times (\# \text{ of nozzles being used})$$

Total airflow (CFM)

TDA-6C Features

The TDA-6C is the latest design in rugged, lightweight Laskin nozzle generators from ATI. The TDA-6C is a self-contained aerosol generator that requires only a suitable voltage source to create poly-dispersed sub micron oil aerosol.

The TDA-6C has 6 Laskin nozzle jets. When its total output at 20 psig is diluted by 200 cfm of air, the aerosol concentration is approximately 100-ug/l. A valve permits the unit to be operated with either 2 or 6 nozzle jets, providing a wide range of aerosol concentrations.

The TDA-6C is recommended for testing systems with airflows of 2,000 cfm and lower. It is ideal for workstations, Negative Pressure Filtration Units, Bio-safety cabinets, ceiling modules, small or portable cleanrooms, or HEPA filter units in installations where an adequate supply of clean, compressed air is not readily available.

OPERATING INSTRUCTIONS TDA-6C AEROSOL GENERATOR (1 ½ Laskin nozzle)

1. Unscrew LIQUID FILL cap located on top of cabinet and fill sight gauge to 3/4 full with desired liquid aerosol agent. Do not overfill. Refill when the level falls to the halfway point on the sight gauge.
2. Connect the unit to an appropriate, grounded, power outlet.
3. Position the generator near the aerosol introduction point of the system under test. A sealed connection to a duct system may be established by using a 3" sanitary flange adapter.
4. Depress the power switch and adjust for desired output concentration.
5. Varying aerosol output concentration.

2 Jet (1/2 nozzle)	Valve #1 OFF
6 Jet (1 ½ nozzle)	Valve #1 ON

NOTE: If more than 20 psig is used, the output concentration will increase and, conversely, if less than 20 psig is used, the output concentration will decrease.

TDA-6C Specifications

Aerosol Output Range: 50-2,025 cfm
Aerosol Concentration 100 ug/1@ 202 cfm
Aerosol Concentration 10 ug/1@ 2,025 cfm
Generator Type: 2 to 6 Laskin nozzle Jets
Aerosol Type: Poly-dispersed (Cold)

Size: 21" L × 8" W × 11" H
(54cm L × 20cm W × 28cm H)
Weight-Pounds (lbs): 55 lbs.
Weight-Kilograms (kg): 25 kg
Electrical: 110 Vac / 60 HZ or 220 Vac / 50 HZ

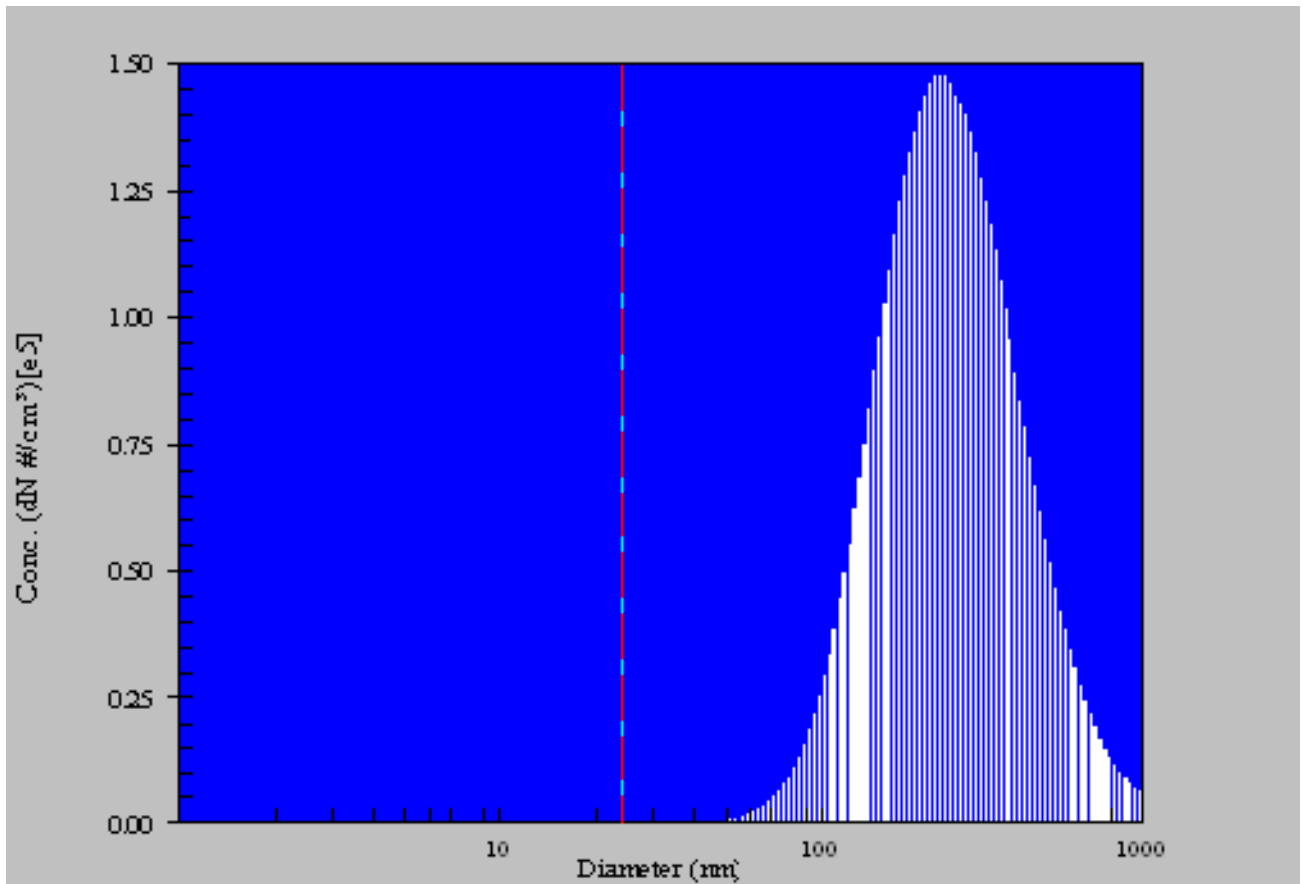
TDA-6C Aerosol output calculation

This unit includes a total of 1 1/2 Laskin nozzles incorporated into the cabinet. Each standard Laskin III-A nozzle consists of four jets located at the nozzle tip, for a total of six jets. The aerosol concentration depends on the compressed air pressure and flow available for consumption by the nozzle. With 20 psig applied, each jet emits 18.75 slpm of air containing 1,275 ug/l of aerosol. When this aerosol is diluted with 135 cfm of air, the aerosol concentration becomes approximately 25 micrograms per liter. The equation below is for purposes of calculating the aerosol output in micrograms per liter (ug/l) when 20 psig is applied to the nozzle jets.

$$3375 \times (\# \text{ of jets being used})$$

$$\text{Total airflow (CFM)}$$

Type III-A Laskin Nozzle Aerosol Distribution @ 20 PSI Using PAO Oil



	Number	Surface	Mass	Volume
	Particle Size	Particle Size	Particle Size	Particle Size
median (nm)	242	414	529	529
mean (nm)	278	453	549	549
geo. mean (nm)	245	405	502	502
mode (nm)	241	429	615	615
geo. st. dev.	1.65	1.62	1.55	1.55
total conc.	4.98e+006 (#/cm ³)	1.56e+012 (nm ² /cm ³)	1.41e+005 (μg/m ³)	1.18e+014 (nm ³ /cm ³)

The following liquids may be used in ATI air operated generators to produce aerosol:

DOP / DEHP (Di 2 ethylhexyl-phthalate)

PAO (Poly-alpha olefin) / Emery 3004

DOS / DEHS (Di-2-ethylhexyl-sebacate)

Mineral Oil

Ondina EL

Kaydol

Polyethylene Glycol (PEG 400)

Paraffin Oil

MAINTENANCE

1. If clean, dry, compressed air is used with this unit, little maintenance should be required. (TDA-4B & TDA-4Blite only)
2. Drain the compressed air filter/regulator daily, or more often, if required. (TDA-4B & TDA-4Blite only)
3. Yearly, under daily operation, drain all liquid and flush with a solvent to remove any residue from the unit. (TDA-4Blite, TDA-4B & TDA-6C)

Note

BEFORE SHIPPING UNIT

1. Drain all liquid from unit.
2. Verify that the LIQUID FILL cap is tight.
3. Stuff aerosol outlet flange with liquid-absorbing cloth or paper to prevent residue from damaging shipping container. (All units)
4. Tape or plug the compressed air inlet on air filter/regulator to prevent internal damage by foreign material. (TDA-4B & TDA-4Blite only)
5. Package the unit in a triple wall carton with a minimum of 3 inches of loose packing fill on all sides.

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ACCESSORIES

ADAPTER KIT

Converts the 3”-sanitary outlet flange of all generators to ¾”-FNPT thread. No hose terminations are supplied due to the high level of variability in requirements. ATI’s technical support personnel are always willing and capable of sourcing or configuring hose termination connections to suit a specific application.

The **9300100**-adapter kit consists of the following:

1 piece	3” to ¾ “-FNPT adapter plate
1 piece	sanitary adapter clamp
1 piece	sanitary adapter gasket
1 piece	compression fitting, ¾” liquid tight conduit to ¾” MNPT

Liquid tight conduit is also available for purchase by the foot using part # **5200106**.

AEROSOL REAGENTS

T100-0625 (5 gallon container) DOP / DEHP (Di-2-ethylhexyl-phthalate)

T000-0795 (5 gallon container) Emery 3004 / PAO (Poly-alpha olefin)

Please contact ATI’s customer service department for current pricing and delivery.