

OPERATOR'S MANUAL

for

TDA-4A

Aerosol Generator

Revision A



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Generator Description

ATI manufactures this portable Laskin nozzle aerosol generator that will 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 10,800 cfm @ 20 psig.

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.

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-4A Features

The TDA-4A was specifically designed for use in biosafety cabinets. Its small size and low cost make it the ideal generator for biosafety cabinet testing and HEPA filter vacuums.

The TDA-4A has 8 Laskin nozzles. When its total output at 20 psig is diluted by 1,080 cfm of air, the aerosol concentration is approximately 100 ug/l. Two valves permit the unit to operate with 1, 3, 6 or 8 nozzles to provide a wide range of aerosol concentrations.

OPERATING INSTRUCTIONS TDA-4A AEROSOL GENERATOR

1. Unscrew LIQUID FILL cap located on top of cabinet and fill sight gauge to $\frac{1}{2}$ and $\frac{3}{4}$ 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 for a pressure of 20 psig. To lock this adjustment in, simply push down on control knob.
4. Varying aerosol output concentration.

| | |
|----------|--|
| 1 Nozzle | 2 Nozzle Valve OFF 5 Nozzle Valve OFF |
| 3 Nozzle | 2 Nozzle Valve ON 5 Nozzle Valve OFF |
| 6 Nozzle | 2 Nozzle Valve OFF 5 Nozzle Valve ON |
| 8 Nozzle | 2 Nozzle Valve ON 5 Nozzle Valve 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-4A Specifications

Aerosol Output Range: 50-10,800 cfm
Aerosol Concentration: 100 ug/l @ 1,080 cfm
Aerosol Concentration 10 ug/l @ 10,800 cfm
Generator Type: 1, 3, 6 or 8 Laskin nozzles
Compressed Air: 2.75 to 22 cfm @ 20 psig

Aerosol Type: Poly-dispersed (Cold)
Size: 12" L × 7" W × 8" H
(30.5cm L × 17.8cm W × 20.3cm H)
Weight-Pounds (lbs): 15 lbs.
Weight-Kilograms (kg): 6.9 kg
Electrical: (Not Required)

TDA-4A Aerosol Output Calculation

These units include a maximum of 8 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 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 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)

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

DOP / DEHP (Di 2 ethylhexyl-phthalate)

Emery 3004 / PAO (Poly-alpha olefin)

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

Mineral Oil

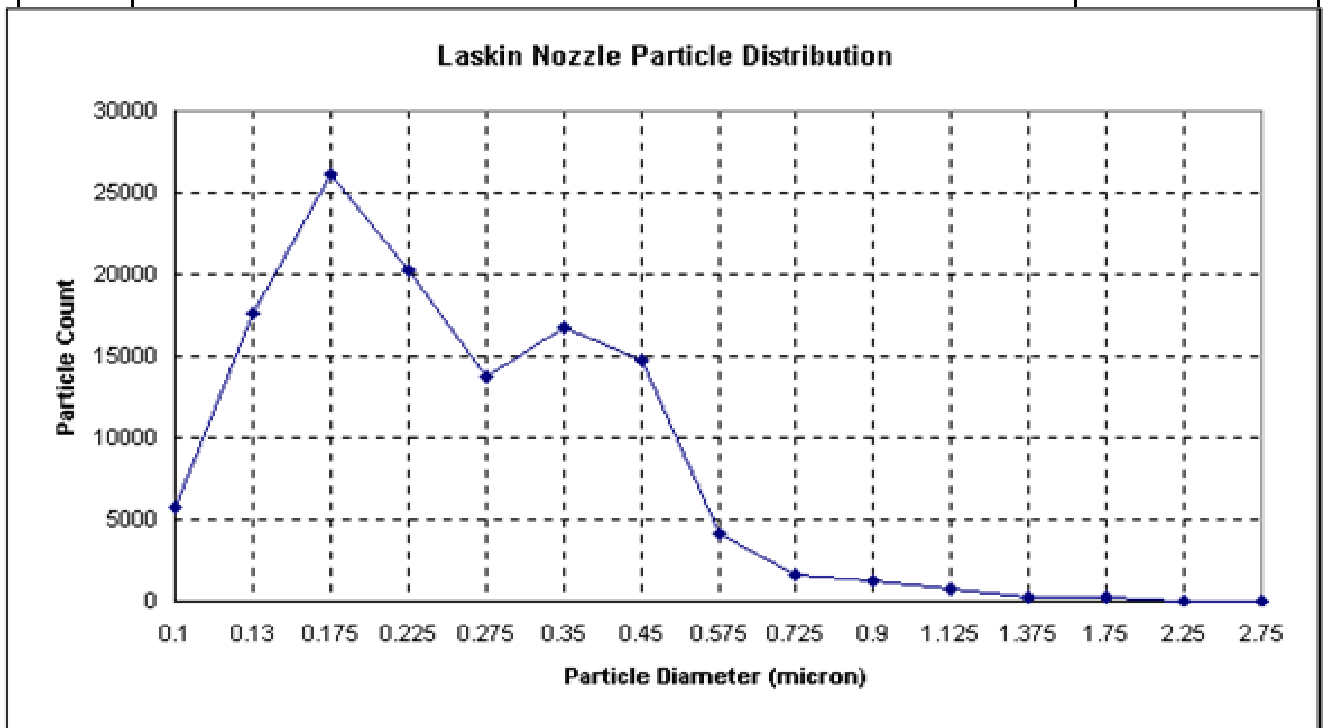
Ondina EL

Kaydol

Polyethylene Glycol (PEG 400)

Paraffin Oil

| Channel | Average Diameter d | Average Particle Count | n*d | n(ln d-ln CMD)^2 | n*ln d | n*d^3 | n*d^4 | n*d^3ln d | |
|---------|--------------------|---|-------------------|------------------|-------------------|----------|-------------------|-------------------|--|
| 1 | 0.1 | 5780 | 578.000 | 6119.313 | -13308.942 | 5.780 | 0.578 | -13.309 | |
| 2 | 0.13 | 17657 | 2295.410 | 10375.760 | -36024.179 | 38.792 | 5.043 | -79.145 | |
| 3 | 0.175 | 26186 | 4582.550 | 5767.711 | -45641.394 | 140.341 | 24.560 | -244.609 | |
| 4 | 0.225 | 20264 | 4559.400 | 963.057 | -30226.894 | 230.820 | 51.934 | -344.303 | |
| 5 | 0.275 | 13694 | 3765.850 | 4.114 | -17678.737 | 284.792 | 78.318 | -367.662 | |
| 6 | 0.35 | 16757 | 5864.950 | 839.518 | -17591.869 | 718.456 | 251.460 | -754.251 | |
| 7 | 0.45 | 14765 | 6644.250 | 3333.369 | -11789.966 | 1345.461 | 605.457 | -1074.361 | |
| 8 | 0.575 | 4126 | 2372.450 | 2140.500 | -2283.267 | 784.391 | 451.025 | -434.071 | |
| 9 | 0.725 | 1619 | 1173.775 | 1467.515 | -520.644 | 616.965 | 447.300 | -198.406 | |
| 10 | 0.9 | 1216 | 1094.400 | 1659.723 | -128.118 | 886.464 | 797.818 | -93.398 | |
| 11 | 1.125 | 728 | 819.000 | 1409.473 | 85.746 | 1036.547 | 1166.115 | 122.088 | |
| 12 | 1.375 | 206 | 283.250 | 522.169 | 65.601 | 535.520 | 736.339 | 170.538 | |
| 13 | 1.75 | 222 | 388.500 | 746.113 | 124.235 | 1189.781 | 2082.117 | 665.820 | |
| 14 | 2.25 | 26 | 58.500 | 112.982 | 21.084 | 296.156 | 666.352 | 240.162 | |
| 15 | 2.75 | 2 | 5.500 | 10.445 | 2.023 | 41.594 | 114.383 | 42.076 | |
| | d | 123248.000 | 34485.785 | 35471.761 | -174895.323 | 8151.860 | 7478.799 | -2362.832 | |
| | Sigma g | 1.710 | CMD =0.242 | | CMeD=0.280 | | MMD =0.748 | | |
| | Notes: | Nozzle pressure-20 PSI DOP Oil CMD = Count Median Diameter MMD = Mass Median Diameter CMeD = Count Mean Diameter MMeD = Mass Mean Diameter | | | | | | MMeD=0.917 | |



MAINTENANCE

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

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.
4. Tape or plug the compressed air inlet on air filter/regulator to prevent internal damage by foreign material.
5. Package the unit in a carton with a minimum of 3 inches of loose packing fill on all sides.

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ACCESSORIES

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.