

# *Dust Collection Efficiency Test System*

*DA2000*  
*DA2001*



Lambda Ray Co.,Ltd.

## *Air Filtration Tester (DA-2000)*

DA2000 is designed to comply with BSI and EN standards, giving particulate penetration / efficiencies of respirator cartridge, air filter elements and materials, in laboratory or production environments.

DA2000 is ideally suited for carrying out Total Inward Leakage (T.I.L) test as in standards EN136, 140, 149, 12941 & 12942.



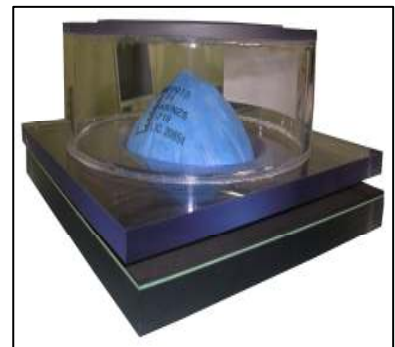
### **compositions :**



Atomizer



Filter Test Fixture



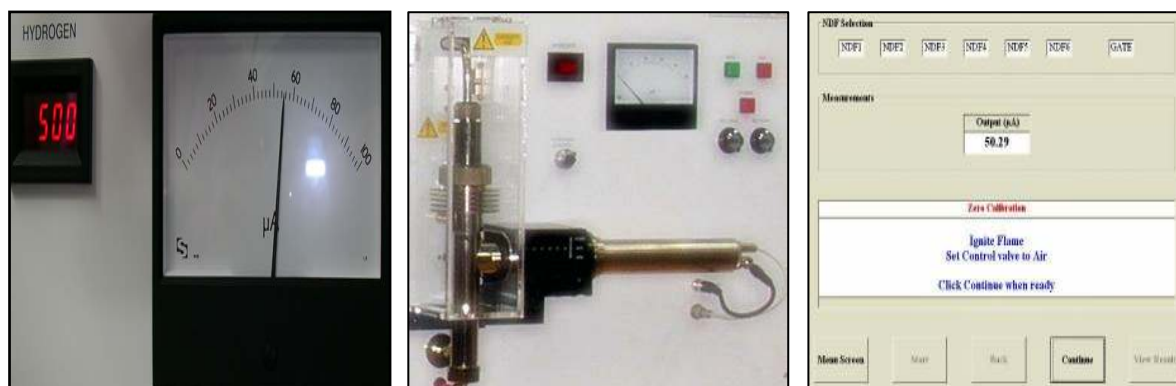
Sample Jig



Sodium Flame Photometer(Filter/TIL) & Data System

# *Air Filtration Tester (DA-2000)*

## Details of Detector & Data system



## Principal of Operation

DA 2000 is initially set up using a high grade (HEPA) air filter, through which the vacuum pump pulls a 2 liter/min sample of ambient air past the hydrogen flame to give a clean air reference point to the detector system, any sample of sodium chloride aerosol detected above this reference of  $50\mu\text{A}$  can be related to the calibration graph.

When Na. Cl. is burnt it generates a specific sodium yellow with a wavelength of 589 nm.

Between the flame and the PMT are neutral density filters [NDF's], these are darkened glass slides of known value, and an interference filter with a tolerance no greater than 3 nm allowing only the sodium wavelength to pass.

The N.D.F's are used to prevent an overload of the PMT when higher concentrations of Na. Cl. are burnt and to keep the meter reading on scale.

For aerosol concentrations up to approx  $0.13\text{mg}/\text{m}^3$  the response is linear, above this level there is some light absorption by the flame, hence the curve on the calibration graph.

The interference filter dedicates the photometer to sodium light therefore any other substances that do not burn with a sodium light, are ignored in the final analysis of the penetration / efficiency of the test device.

## *Air Filtration Tester (DA-2000)*

### Specification

<b>Sodium Flame Photometer</b>	
Sensitivity	Better than 10ng/m <sup>3</sup> giving a minimum detectable penetration of less than 0.0005% with a challenge aerosol of 13mg/m <sup>3</sup> Response time : 400ms Band by-pass filter : better than 0.3nm
Maximum Concentration	Continuous indication of mass concentrations up to 3mg/m <sup>3</sup> , but for short periods up to 20mg/m <sup>3</sup> if calibrated to this level
Sample Flow Rate	2 liter/min ± 0.1 liter/min (Fixed with electric pump, adjustable with venturi suction)
Inhalation Sensor	Accuracy : ±0.5% full scale, Operating temperature : 0 to 50°C
Pulsed Sampling Switching valves	Response time : 30ms, Rated for 26Hg vacuum Max operating temperature : 70°C
Gas supply	Hydrogen 0.6 liter/m @ 2 bar
Air supply	Minimum flow 50 liter/min @ 5 bar
Electrical Power	230 Vac 50 or 60 Hz, Single Phase
Dimension	1.58m (W) x 0.5m(H) x 0.29m(D)
Weight	About 74 Kgs



## **Air Filtration Tester (DA-2000)**

<b>Filter Test Fixture</b>	
General Description	A pneumatically operated clamping unit using a adaptor plates to suit area or filter under test
Dimensions.	400mm wide x 300mm deep x 450mm high (closed)
Weight	8.8Kg
Air Supply	Clean, dry, oil-free (can be supplied from photometer). 3.5 to 7.0 bar. Regulator to control the clamping pressure plus restrictors on the ram inlets
Test Area	200cm <sup>2</sup> . Adaptor plates to suit 100cm <sup>2</sup> and filters

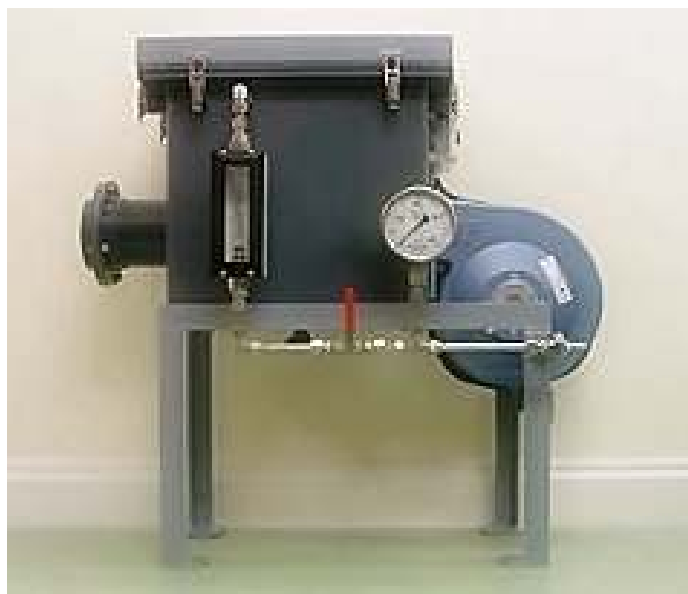


<b>Atomizer (Sodium Chloride Aerosol Generator)</b>	
General Description	This atomizer is used in the DA2000 bench-mounting rig and is described in EN143. It is a compact unit, using a 1 liter commercially available glass jar (reservoir) and removable nozzle for easy maintenance.  A 0.5 liter jar (reservoir) for atomizing small quantities of solutions as used in microbiology is also available.
Dimensions.	280mm high x 105mm wide x 105mm deep [1.0 liter]
Air Supply	13 liters/min. @ 3.45 bar
Aerosol Size	Used with Na Cl solution 0.6 $\mu$ m MMD using the longest diagonal. (0.4 $\mu$ m MMD. measured aerodynamically), complying with EN143 EN13274-7
Solution Charge	Approx: - 600 ml for 1.0 liter reservoir



## **Air Filtration Tester (DA-2000)**

<b>TIL Atomizer (Collision Atomizer for Total Inward Leakage : TIL)</b>	
Purpose	Generate a sodium Chloride aerosol which meets the requirements of EN 13274-1 and EN149, when operated at 7 bar[100psig] with 2% w/v Na. Cl. Solution. For use in conjunction with a Low flow Sodium Flame photometer.
Concentration	7mg/m <sup>3</sup> @ 7000 l/min
Compressed Air	Clean, dry, oil free compressed air, 100 l/m @ 7 bar. [ 3,5 CFM @ 100 psig.]
Dimensions	0,8m long x 0,78m high x 0,4m deep
Weight	23 Kgs
Finish	Frame Stand : Powder Coated mid grey. Reservoir : Grey UPVC
Power Supply	230 Vac 50/60 Hz 2,5 Amps
Air Supply	Clean, dry, oil free compressed air 100 l/m @ 7 bar. [ 3,5 CFM @ 100 psig.]
Sodium Chloride Solution	20 grams Na. Cl. per Litre Water. Na. Cl. should be laboratory grade. Water should be de-mineralised or better.
Prime Calibration	Before dispatch includes, Atomizer nozzle [ free air flow ] Pressure gauge at 100psig and Flow meter at 95 & 100 l/m



# Breathing Resistance Measuring Equipment (DA2001)

## General Description

This European Standard specifies minimum requirement for filtering half masks as respiratory protective devices to protect against particles for escape purpose

The breathing resistance apply to valved and valveless particle filtering half Masks and will meet the requirement of European Standard

## Technical Specification

### **Dimensions**

300mm wide x 300mm deep x 570mm high.

### **Air mover (Blower/Sucker)**

Capable of supplying an airflow rate of no less than 200 liter/min against a resistance of 10mbar at the mouth of the Sheffield head

### **Sheffield Head**

Line path to manometer  
Line path from breathing machine  
Dummy Head

### **Test Range**

Inhalation

### **Power**

220 Vac. 50/60 Hz. Single Phase

### **Relevant Standard**

EN 419.



# *Breathing Resistance Measuring Equipment (DA2001)*

<b>Microprocessor Micromanometer</b>	
Ranges	20.000/200.00 Pa, Velocity 18.000m/s
Languages	English, French, German
Accuracy	0.25% of reading between 10% of lowest range and full scale, $\pm$ one digit below 10%, better than 0.025% FSD
Storage temperature	-10 °C to 50°C
Working temperature	0°C to 45°C
Mains supply	90 to 250 VAC 50-60 Hz
Relative viscosity range	0.1 to 3.0
Relative viscosity range	0.1 to 3.0
Pitot K factor range	0.5 to 3.0
D.P units	Pa, kPa, mmH <sub>2</sub> O, “H <sub>2</sub> O, $\mu$ bar, mbar, mmHg, “Hg, thou, Nm <sup>-2</sup> , PSF
Absolute pressure units	kPa, mbar, bar, PSI, “Hg
Mass flow units	kg/s, kg/m, kg/h, lb/s, lb/m, lb/h
Dimensions	300 x 125 x 250 mm

