

**INSTRUCTIONS  
FOR HAZ-DUST  
RESPIRATORY PARTICULATE  
AIR MONITOR  
MODEL HD-1100**



Environmental Devices Corporation  
4 Wilder Drive Bldg. 15 • Plaistow, NH 03865  
Tel: (603) 378-2112 • Fax: (603) 378-2113  
E-mail: [customerservice@hazdust.com](mailto:customerservice@hazdust.com)  
Website: [www.hazdust.com](http://www.hazdust.com)  
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## WARRANTY

**Environmental Devices Corporation** warrants only non-expendable products, parts and labor, for a period of one year from date of shipment to the original purchaser. The warranty covers only product parts and labor that failed due to normal operation of the instrument and not due to abuse or negligence. The product will be delivered in accordance to its published specifications and free from defects in materials or workmanship.

If a product fails to conform to this one year limited warranty it may be returned to the factory for repair or replacement of the defected part(s). **Environmental Devices Corporation** must be notified of all returning warranty repair products, either in writing or by telephone, along with a description of product malfunction. Shipping and insurance cost will be prepaid by the purchaser.

**Environmental Devices Corporation** makes no other express warranty and disclaims any implied warranty and disclaims any implied warranty of fitness or merchantability.

## INTRODUCTION

HAZ-DUST is a portable direct reading particulate monitor that uses infrared electromagnetic radiation to sense airborne particles. The sensing method is traditionally referred to as near forward light scattering. The principle of near forward light scattering utilizes a light source emitter and a photodetector positioned at a 90-degree angle. As particles transverse the sensing volume, they scatter IR light at a forward angle of 45-90 degrees. The amount of scattered light is directly proportional to the aerosol concentration.

The mass concentration readout is expressed in milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ). The calibration of the instrument can be changed to compensate for any changes in particle composition and distribution.

HAZ-DUST is calibrated with standard test dust. The particle size range is from 0.1 to 50um this represents the EPA PM10 criteria and thoracic region for airborne particles as defined by the ACGIH (American Conference of Government Industrial Hygienists) and the NIOSH (National Institute of Occupational Health and Safety) Reference method #600.

This instrument can be used for all Industrial and environmental particulate air monitoring applications. In addition the unit is valuable for aiding in the compliance to OSHA (Occupational Safety and Health Administration) Air Contaminant Exposure Standards. OSHA has prepared an 86 page booklet titled "Air Contaminants Permissible Exposure Limits" OSHA publication #3112. Free copies may be obtained by sending a self-addressed envelope to:

OSHA Publications Office  
Room N-3101  
U.S. Dept. of Labor  
Washington, DC 20210

## **FEATURES**

### **A. RANGE SWITCH**

Hi range - This range provides the most sensitivity. The range span is from 0-20 mg/m<sup>3</sup>.

Lo range - This range setting is recommended for monitoring in areas that generate more than 10mg/m<sup>3</sup> of dust. The range span is from 0-200 mg/m<sup>3</sup>.

### **B. ANALOG OUTPUT**

Although the DL-103 Data Logger is recommended, the 0-2v output can transfer its linear analog voltage to any data logging device that can accept an analog signal. This output should be utilized if hard copy documentation is needed. 0-1v corresponds to 0-100mg/m<sup>3</sup>. The HD-1100 will over range to 2volts or 200mg/m<sup>3</sup>.

## **OPERATION**

### **A. Start up**

To start measuring particle concentrations turn power switch to “on” and allow unit to warm-up for a few minutes. Set range switch to “0-20mg/m<sup>3</sup>” position.

### **B. Battery Status and Charging.**

The Haz-Dust HD-1100 is powered by NiMH batteries, which have a variable lifetime that can range from 500-1000 hours. The batteries need to be replaced when they do not hold a charge for 8 hours. To check to see if batteries need charging depress “Bat” on power switch and observe reading on display. Reading should be greater than 6.0 when range switch is in the high position to use equipment.

**NOTE:** Be sure to set the switch to the “off” position when you are finished checking the battery status batteries will discharge.

When charging batteries leave charger connected for 10-12 hours with unit “off”.

**NOTE:** Unit should not be connected to charger when off for more than 12 hours.

### **C. ZEROING**

For this procedure it is very important to perform the zero adjustment in a clean environment with respect to the environment being monitored. It is recommended to purchase the optional accessory ZA-111 is available for zeroing monitor.

To zero the unit, turn the zero adjustment screw with the provided trim stick, so that the display reads 0.00+/-0.02mg/m<sup>3</sup>. This process requires patience. It is recommended to turn the zero adjustment in very small increments and wait for one minute for readings to stabilize.

After the unit has been zeroed, the range switch can be set to the “0-200mg/m<sup>3</sup>” position. Now you are ready to start monitoring for airborne particulates.

## OPERATION, *Continued*

### D. MONITORING

When monitoring hold unit in the palm of your hand, or place on the optional tripod accessory<sup>1</sup>, so that the display is facing in the up position. Take precaution in monitoring in areas that produce high reflective light (i.e., directly next to arc welding, flash explosions, reflected sun light etc.). When necessary position the unit so that the air intake is opposite bright light. Bright fluctuation may produce erroneous data. The unit will provide readings in milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ) and is calibrated to against a standard test dust using NIOSH method #600.



<sup>1</sup> Tripod accessory sold separately P/N TP-111.

## **MAINTENANCE**

Annual factory re-calibration recommended.

Maintenance on the unit is minimal. Replacement of the battery pack and cleaning of the sensing chamber are the most frequent procedures that must be performed. An annual re-calibration is recommended.

Cleaning the instrument sensing chamber depends on the length of time and the concentration of dust the unit has been exposed to. In general, if monitoring a concentration of  $1 \text{ mg/m}^3$  for a period of 8 hours, cleaning should be performed every 24 hours. It is always recommend checking the zero reading after cleaning.

### **Procedures for Cleaning**

1. Remove optical light trap that is held in place by brass thumbnuts located on the reverse side of the unit.
2. Observe optical block. Using the dust free air, blow off any residue dust inside the optical light trap and on the optical block.
3. Clean windows with cotton swab rinsed in cleaning solution and allow air to dry.
4. Replace optical light trap.
5. Re-zero Unit (see Zeroing instructions.)



## Replacement Battery Pack for the HD-1100 Part Number BP-111



Figure 1: Remove six screws

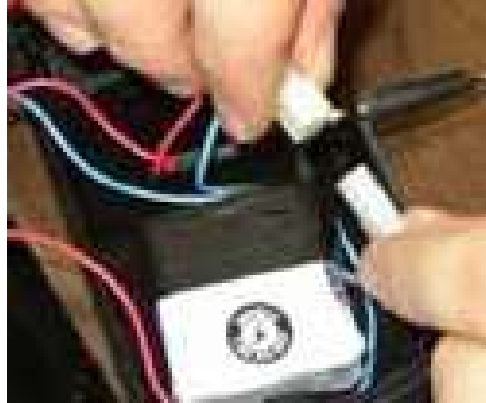


Figure 2A: Disconnect battery from nylon connectors. NOTE: DO NOT PULL ON WIRES.



Figure 2B: Reconnect battery from nylon connectors. NOTE: DO NOT PULL ON WIRES.

### *Instructions to replace battery pack*

1. Remove optical cover from sensor.
2. Unscrew the screws on back of HD-1100 housing. See figure 1.
3. After screws are removed gently remove back cover to HD-1100.
4. To remove the battery pack, disconnect the nylon connectors and remove battery. See figure 2A.
5. Insert new battery pack and connect nylon connectors. See figure 2B.
6. Replace back cover of housing and screw back together.

## **ACCESSORIES**

<b><u>Order Number</u></b>	<b><u>Description</u></b>
DL-103	Data Logger
BP-111	Replacement Battery Pack
BC-111	Battery Charger
TP-111	Tripod Mounting Stand
CS-111	Calibration Standard
AS-111	Analog Signal Cable
KK-101	Cleaning Kit
DA-101	Dust Free Air
ZA-111	Zeroing Accessory

## SPECIFICATIONS

Sensing range:	0.01-200 mg/m <sup>3</sup>
Particle size range:	0.1-50um
Precision:	+/-0.02mg/m <sup>3</sup>
Accuracy:	+/-10%
Power:	NiMH battery
Operating time:	>8hrs (fully charged)
Charging time:	10-12 hours
Signal output:	0-2 volts
Operating temperature:	0-50 degrees Celsius (32-120 degrees Fahrenheit)
Dimensions:	9" x 3" x 1.5"
Weight:	2 lb.

## **SERVICE INFORMATION**

All service functions are performed at the factory by qualified service technicians. Please call or write Environmental Devices before returning any products. Before returning a unit for servicing a Return Authorization Number (RMA number) must be issued by Environmental Devices.

Send all return products to:

***Environmental Devices Corp.  
4 Wilder Drive Bldg. 15  
Plaistow, NH 03865 USA  
Phone: (603) 378-2112  
E-mail: [customerservice@hazdust.com](mailto:customerservice@hazdust.com)  
Website: [www.hazdust.com](http://www.hazdust.com)***

For warranty returns please see section labeled Warranty.