

Decane Ammonia LEL Ethylene Oxide Chlorine Ketones Chloroethene

# Model DL102 Snap-On Photoionizer™

Solvents Diesel Fuel Nitric Oxide Ethylene Dichloride Inorganic Compounds RH/Temperature Benzene Vinyl Chloride Propylene



Model DL102 Snap-On PID™ with 11.7 eV Head

Methane Solvents Gasoline Inorganic Compounds Benzene Trifluoroethene Bromoethane Propylene Acetic Acid Chloroform Phosphine Arsine Nitrogen Dioxide Butane Biphenyl Dibromoethane Benzene Inorganic Compounds Hydrogen Telluride Hydrogen Sulfide Diethyl Ether Ammonia Ethanoic Acid Propanol Kerosene Aliphatic Hydrocarbons Hydrogen Cyanide Relative Humidity Isopropanol Ethane

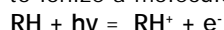
**A New Era in Photoionization;**  
from the makers of the *original* photoionizer

## INTRODUCTION-

PID Analyzers recently acquired HNU's technology including [Field Portable PIDs](#), [Laboratory Instruments and Continuous Monitors](#). HNU introduced the first commercial photoionization based instrumentation. Nearly 35,000 of the portable and laboratory PIDs have been sold throughout the world. Many United States Environmental Protection Agency and Occupational Safety & Health Administration (OSHA) methods have been published in the Federal Register.

### Principle of Operation

The process occurs when a molecule absorbs light of sufficient energy to ionize a molecule see below:



in which

**RH** is a molecule of gas

**hv** is a photon with an energy greater than or equal to the ionization potential of the molecule RH.

The ultraviolet lamp generates photons that ionize the molecule RH (above) and generates positive ions. An accelerator electrode (positively biased) pushes the ions, to the collector electrode where the current generated (proportional to concentration) is amplified and displayed on the digital meter.

## FEATURES

### Durable & Rugged

More than 25,000 HNU portable PID's (101's) have been sold worldwide since HNU introduced the first PID in 1974. More than 90% of these instruments are still working today. These instruments are the most rugged and durable instruments on the market today. They do not require replacement every two to three years.

### Accurate Results

HNU's unique electronic zero, state-of-the-art electronics and **ultra stable** PID lamp ensure the most accurate results available for VOCs.

### Electronic Zero

HNU's unique automatic electronic zero provided a reliable calibration point so that when calibrated with a span gas, this is a two point calibration.

### Easy to Maintain

HNU's new Duraclean™ PID is more inert and will run for longer periods without the need for cleaning the lamp or the ion chamber

In addition, **a new library of compounds > 200 is available** for selection by the customer.

**Snap On PID-** easy to interchange modules for 9.5, 10.2 or 11.7 lamps just snap on to the Docking Module. Now change the mode to the PID module inserted and the instrument is **ready for calibration in seconds**. No cables or wires to fuss with.



### Chemicals Detected

VOC's, hydrocarbons, hydrogen sulfide, ammonia, benzene, phosphine, arsine, methylene chloride, 1,3 butadiene ...

### Extended Range- (linear)

From 0.1 ppm to 3000 ppm for DL102; **optional dilution probe** extends the linear range to > 30,000 ppm for leak detection

- Fast response 1 second to 90%
- Wide dynamic range (16 bit ADC) ppb to % with optional dilution probe
- Library- >200 compounds
- Excellent stability (zero & span)
- Alphanumeric display- pt. #, units, mode
- Other "snap on" detectors for CO, NH<sub>3</sub>, H<sub>2</sub>S, CH<sub>4</sub>, SO<sub>2</sub>, NO, Cl<sub>2</sub>, H<sub>2</sub> ...- available soon

## APPLICATIONS

**Non-specific-** 102- Responds to VOC's & inorganic species (NH<sub>3</sub>, H<sub>2</sub>S, PH<sub>3</sub>, AsH<sub>3</sub>, etc.)

**Headspace-** VOCs in soil or water

**Quality control-** residual monomer in resins, residual solvents in paper or food, testing gas masks, residual gases in cylinders

**Emergency response-** spills from trucks & trains

**Fugitive emissions-** leak detection

**Arson investigations-** find trace accelerants

**Confined space entry-** health & safety

### Controls

- On/off
- Bkl- Backlight
- Incr
- Decr

### Menus

- Log
- Cal

### Options

Dilution probe (10:1) extends range to 30,000 ppm

- ppb Readout
- Carrying case
- Calibration kit
- RS232 & downloading software
- Belt clip for holding 102 via strap

### Specifications

- Single unit construction
- 8.0" L x 3" W x 2.25"D
- Weight 1.9 pounds
- Simple 5 button operation
- No keyboard
- Easy to use even for unskilled operators
- **Library of sensitivities built in** for > 200 compounds
- Use "Resp as" to setup for direct reading
- Alphanumeric display for compound, detector, alarm, range, & logging
- Linear to 3,000 ppm
- Bright LED digital display for readability/backlighting selectable
- Fast response 1 sec to 90%
- Datalogging for 7,000 points
- Duraclean™ PID
- RS232 output
- Auto electronic zero in Cal, background zero
- Simple pushbutton sensitivity control

### Reliability

The basic simplicity, durable construction and design of the Model 102 has resulted in the elimination of problem areas associated with many measurement techniques.

### Other Instruments-

Process Analyzers manufactures continuous monitors such as: FIDs & PIDs for total hydrocarbons, NDIRs for CO, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O NO SO<sub>2</sub> and hydrocarbons, & Process GCs. Additional products include portable PIDs, portable GCs laboratory GCs, add-on detectors and XRF instruments

## Controls for the Model 102

**On/Off**- Battery power  
**Incr**-Function ON, scrolling menu up, increase number  
**Decr**-Function OFF, scrolling menu down, decrease number  
**Bkl**-Turns backlight on/off



### Menus

#### Log

Manual-Set site #, and manually log each pt.  
Auto- Set ave. time (sec) and samples/hr. to Auto log  
Site # 1-7000  
Setup- Setup Auto; Ave. time sec., samples/hour  
Exit- Return to Run

#### Cal

Cal- Performs Autozero, set cal value, calibration  
Bkg Zero-  
Cal Gas- Select name of cal gas  
Resp as- Once the 102 is calibrated-change to direct reading on any of > 200 compounds  
Alarm- Set Alarm value for audible alarm  
Exit- Return to Run mode

### Datalogging

The 102 has manual or automatic datalogging capability for up to 7,000 points. The software for data logging is included with the Model 102. IT uses Windows Hyperterminal for downloading the information for the 102. A typical Auto datalogging format is shown below:

```
102 Data From Hyperterminal
Site   Date       Time           ppm
495   SP6   6/12/2002 15:02:27   7   1.7
496   SP6   6/12/2002 15:03:27   7   1.6
497   SP6   6/12/2002 15:04:27   7   1.6
498   SP6   6/12/2002 15:05:27   7   1.6
499   SP6   6/12/2002 15:06:27   7   1.6
500   SP6   6/12/2002 15:07:27   7   1.6
End Of Log Data
```

This data can be imported directly into Excel as Tab Delimited ASCII.

## SNAP ON HEADS

There are more than 20 sensors available for the HNU Snap On Head. Each head has a PID (except for the TCD head). **Three additional sensors can be added** to a PID head (9.5 eV, 10.2 eV, or 11.7 eV). These include electrochemical (choice of 12), infrared (choice of 2), RH/T (combined 2 sensors), and TCD

Typical Applications include:

- Indoor Air Quality- PID/RH/T/CO<sub>2</sub>
- Confined Space- PID/LEL/O<sub>2</sub>/CO
- Leak Detection- PID/LEL
- Wastewater tmt.-PID/H<sub>2</sub>S
- Chemical Plant- PID/Cl<sub>2</sub>
- Pulp & Paper- PID/H<sub>2</sub>S
- Combustion leaks- PID/CO

## Sensors for the Model 102 Snap On Head



There are more than 20 sensors available for the Model 102.  
A PID **and** any three sensors can be incorporated into the head.

**Table I**  
**Specifications of Gas Sensors for the Model 102**

Analyzer	Range ppm	Det. Limit	Response Time	Interferences
<b>PID</b>				
9.5 eV	0-3000	0.1	1 sec.	NA resp. to VOCs
10.2 eV	0-3000	0.1	1 sec.	NA resp. to VOCs
11.7 eV	0-3000	0.1	1 sec.	NA resp. to VOCs
<b>Electrochemical</b>				
Carbon Monoxide	0-500/1000	1/2	15 sec.	H <sub>2</sub> , C <sub>2</sub> H <sub>4</sub>
Chlorine	0-10	0.1	30 sec.	-----
Hydrogen	0-1000	2	45 sec.	CO, C <sub>2</sub> H <sub>4</sub>
Hydrogen Cyanide	0-100	0.1	50 sec.	C <sub>2</sub> H <sub>4</sub> , H <sub>2</sub> S, SO <sub>2</sub>
Hydrogen Chloride	0-100	0.1	1.5 min.	-----
Hydrogen Sulfide	0-100	0.1	20 sec.	-----
Nitric oxide	0-50	0.1	10 sec.	NO <sub>2</sub>
Nitrogen dioxide	0-20	0.	15 sec.	Cl <sub>2</sub> , H <sub>2</sub> S
Oxygen	0-30%	0.1%	15 sec.	-----
Sulfur dioxide	0-20	0.1	20 sec.	NO <sub>2</sub>
Carbon dioxide	0-3000	1	25 sec.	vol. org acids
Ammonia	0-3000	0.1	15 sec.	vol. amines
<b>Infrared</b>				
LEL	0-100%	1%	20 sec.	-----
Carbon dioxide	0-2%	0.04%	20 sec.	-----
<b>RH/Temperature</b>				
Relative humidity	0-100%	0.1%	50 sec.	-----
Temperature	0-60°C	0.1°C	20 sec.	-----
<b>TCD*</b>				
Organic & inorganic	0-100%	1%	30 sec.	NA

Not available with PID in head at the same time

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