Decane Ammonia LEL Ethylene Oxide Chlorine Ketones Chloroethene

Model DL102 Snap-On Photoionizer™

Solvents Propylene Diesel Fuel Vinyl Chloride Nitric Oxide Inorganic Compounds Ethylene Dichloride RH/Temperature Benzene Oxygen Biphenyl Methane Gasoline Solvents Hydrogen Sulfide Gasoline Inorganic Compounds Silane Benzene Carbon Monoxide Trifluoroethene Ammonia Bromoethane Solvents Propylene Acetic Acid Phosphine Arsine Chloroform Nitrogen Dioxide Butane Biphenyl Dibromoethane Electrochemical Sensors Hydrogen Sulfide Benzene Hydrogen Telluride Hydrogen Sulfide Inorganic Compounds Ammonia Ethanoic Acid Diethyl Ether Propanol Hydrogen Cyanide Kerosene Aliphatic Hydrocarbons Isopropanol Relative Humidity Chloroethene Ethane Nitrous Oxide

Model DL102 Snap-On PID™ with 11.7 eV Head

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

INTRODUCTION

Process Analyzers acquired HNU's technology including *Field Portable PIDs*, *Laboratory Instruments* and *Continuous Monitors*. HNU introduced the first commercially available photoionization detector in 1973. 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 using HNU instrumentation 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:

$$RH + h\upsilon = RH^+ + e^-$$

in which:

RH is a molecule of gas

hυ 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 and Rugged

More than 25,000 HNU portable PIDs (101s) have been sold worldwide since HNU introduced the first PID in 1973. 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 the best PID lamp available ensure the most accurate results available for VOCs.

Electronic Zero - easy to calibrate

HNU's unique automatic electronic zero provides a reliable calibration point so that when calibrated with a span gas, this is a two point calibration. Since the zero is automatic, calibration takes only 10 seconds.

Easy to Maintain

Our new Duraclean™ PID is inert and will run for longer periods without the need for cleaning the lamp or the ion chamber.

Built in Library

More than 200 compounds are available for selection for direct reading.

SNAP-ON PID™

It is easy to interchange modules from 9.5, 10.2 or 11.7 lamps; just snap on your choice of head to the Docking Module and the instrument is *ready for calibration in seconds*. There are no cables or wires to connect.

Other Snap-On Detectors for:

CO, H_2S, HCN, LEL, H_2, HCl, CL_2, H_2S, HCN, NO, NO_2, SO_2, O_2, CO_2, NH_3, CH_4, HC, RH

Extended Range - (linear)
From 0.1 ppm to 3000 ppm for DL102; *optional dilution probe* extends the linear range to more than 30,000 ppm for leak detection
Fast response - 1 second to 90%
Wide dynamic range (16 bit ADC) ppb to % with optional dilution probe
Excellent stability - zero and span

APPLICATIONS

Non-specific DL102 PID responds to VOCs & inorganic species (NH_3, H_2S, PH_3, AsH_3, etc.)

Arson investigations - trace accelerants
Confined space entry - VOCs and H_2S, LEL, O_2, CO
Emergency response - spills from trucks and trains
Fugitive emissions - leak detection
Headspace - VOCs (gasoline) in soil or water
Vapor well monitoring - gasoline and diesel
Hazardous waste - site entry, water & soil screening
Indoor air quality - VOCs, RH, T and CO_2
Quality control - residual monomer in resins, residual solvents in paper or food, testing gas masks, residual gases in cylinders

CHEMICALS DETECTED

VOCs, hydrocarbons, hydrogen sulfide, ammonia, benzene, VCM, ETO, TCE, PCE, gasoline, diesel, fuel oil, phosphine, arsine, methylene chloride, 1,3 butadiene (10.2 eV PID head); formaldehyde, chloroform, methanol, carbon tetrachloride, 1,1,1 TCA, EDC (11.7 eV PID head); aromatics, amines, mercaptans (9.5 eV head)
Electrochemical sensors - H_2, HCl, Cl_2, H_2S, HCN, NO, NO_2, SO_2, O_2, CO, CO_2, NH_3
Infrared - LEL, CH_4, HC, CO, CO_2
Relative humidity, temperature (RH/T)
TCD - organics, inorganics, fixed gases

OPTIONS

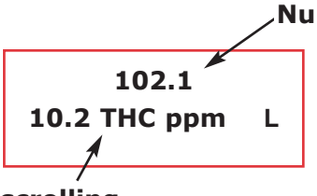
- Dilution probe (10:1) extends range to 30,000 ppm
- ppb readout
- Shoulder carry bag
- Hard carrying case
- Calibration kit
- RS232 & downloading software
- 12 VDC charger with cigarette lighter adapter
- 3 PID snap–on Heads (9.5, 10.2, 11.7)
- Sensors: electrochemical, IR, RH/T, TCD, Velocity/T
- Longer probes available - consult factory

SPECIFICATIONS - (PID)

- Single unit construction
- 8.0" L x 3" W x 2.25" D
- Weight: 1.9 pounds
- Simple 5 button operation
- No keyboard-just keypad
- Library of sensitivities for more than 200 compounds
- "Resp as" to setup for direct reading for 200 cpds
- Alphanumeric display for compound, detector, alarm, range, and logging
- Linear to 3,000 ppm
- LCD digital display that is backlight selectable
- Fast response: 1 sec. to 90%
- Datalogging for 7,000 points
- 4 Sensor inputs (PID + 3 other sensors)
- Low battery indicator & automatic shutdown prevents battery damage
- Duraclean™ PID
- RS232 output
- Analog output for recorder
- Auto electronic zero in Cal
- Simple push button sensitivity control

102 Display

Run Screen



Upper numeric display is the concentration: the lower scrolling display provides information on the type of sensor and the status of logging and alarms.

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 - Electronic zero
Cal Gas - Select name of cal gas
Resp as - Once the 102 is calibrated,change to direct reading on any of more than 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 datalogging is included with the Model 102. Windows Hyperterminal is used for downloading the information for the 102. Auto datalogging is shown below:

102 Data From Hyperterminal

Sample #		Date	Time	Site	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 h ead. 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 3), RH/T (combined 2 sensors), velocity/temperature and TCD

TYPICAL APPLICATIONS INCLUDE:

Indoor air quality, confined space, leak detection, wastewater treatment, chemical plant, pulp and paper plants, combustion leaks, vapor wells.

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 DL-102

Analyzer	Range ppm	Det. Limit	Response Time	Interferences
PID				
9.5 eV	0–3000	0.1	1 sec.	-----
10.2 eV	0–3000	0.1	1 sec.	-----
11.7 eV	0–3000	0.1	1 sec.	-----
Electrochemical				
Carbon Monoxide	0–500/1000	1/2	15 sec.	H_2, C_2H_4
Chlorine	0–10	0.1	30 sec.	-----
Hydrogen	0–1000	2	45 sec.	CO, C_2H_4
Hydrogen Cyanide	0–50	0.1	50 sec.	C_2H_4, H_2S, SO_2
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_2
Nitrogen Dioxide	0–20	0.1	15 sec.	Cl_2, H_2S
Oxygen	0–30%	0.1%	15 sec.	-----
Sulfur Dioxide	0–5	0.1	20 sec.	NO
Carbon Dioxide	0–3000	1	25 sec.	vol. org acids
Ammonia	0–3000	0.1	15 sec.	vol. amines
Infrared				
LEL, CH4, HC	0–100%	1%	20 sec.	-----
Carbon Dioxide	0–2%	0.04%	20 sec.	-----
RH/Temperature				
Relative humidity	0–100%	0.1%	50 sec.	-----
Temperature	0–60° C	0.10C	20 sec.	-----
TCD*				
Organic and inorganic	0–100%	1%	30 sec.	NA

* Not available with PID inside head at this time.

Other Instruments

Process Analyzers manufactures continuous monitors such as FIDs and PIDs for total hydrocarbons, NDIRs for CO, CO_2, CH_2, N_2O, NO, SO_2 and hydrocarbons, and customized process GCs. Additional products include portable PIDs, portable GCs, laboratory GCs, add–on GC detectors, XRF instrumentation, electrodes and meters.

Process Analyzers

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