DOD Technologies


# IsoSense

## Personal MDI or TDI Detection Kit
## Operating Manual

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DODtec.com

# Table of Contents

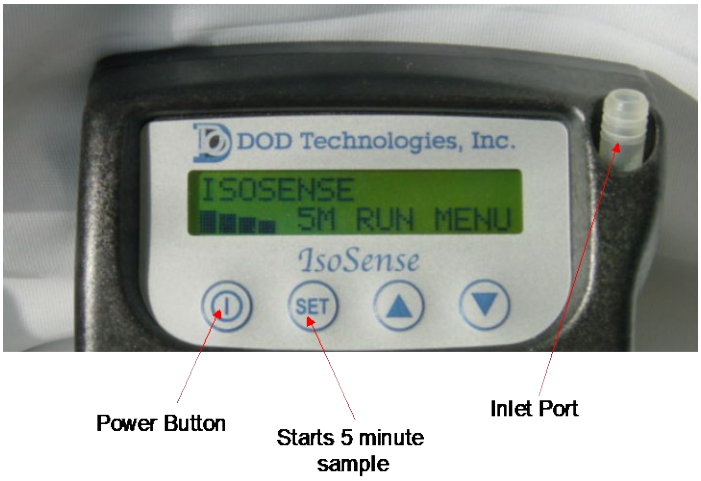
# Chapter 1 – IsoSense MDI / TDI Operation

Your IsoSense kit is provided with a custom designed pump unit. This pump unit can also be used for a variety of sampling needs. The Pump unit is setup with a 5 minute sample "5M" specifically designed to be used with the provided sample head. For other sampling refer to pump manual.

## 1.1 – Using The IsoSense

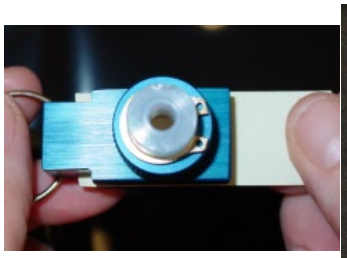
1. Connect the sample head tube to the inlet port on the IsoSense pump unit.

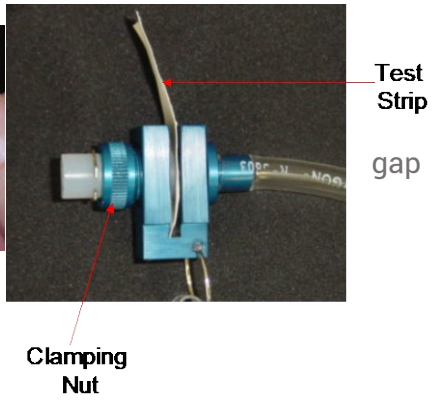
2. Power the unit up by pressing and holding the power button for 2 seconds. If the display to right is not displayed, press the down arrow. This will exist the screen and bring you to the main screen.




The IsoSense pump has been preset for 1500cc flow rate and to run for 5 minutes when the "5M" option is used.

3. Loosen clamping nut to attain adequate gap to insert test strip.

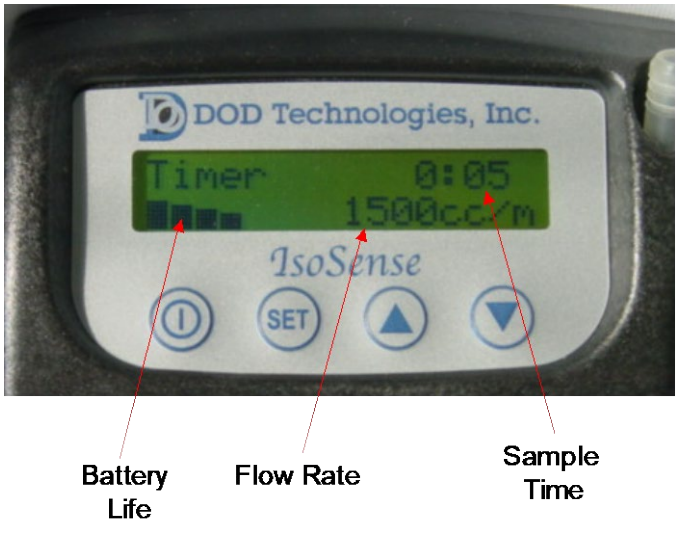





4. Place test strip in the sample head as shown at right and tighten clamping nut. Avoid handling the portion of the test strip that will be inserted in the sample head.

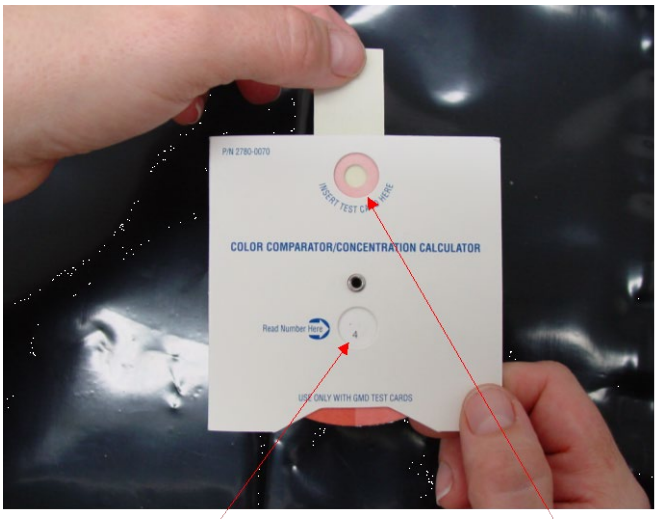
5. Press the "SET" button to start the 5-minute sample. The IsoSense pump will display battery life, set flow rate, and the length of the sample. The sample time for TDI & MDI is 5 minutes at a flow rate of 1500 cc's with the test strip installed.

   Once the "SET" button is pushed which starts the "5M" (5 minute sample options), the IsoSense pump will begin sampling. The sample time will count down from 5 minutes. At the end of 5 minutes, the IsoSense pump will stop sampling and power down.



6. Once the sample has been completed, loosen the clamping nut and remove the test strip. Place the test strip in the concentration calculator that has been provided. The test strip should be placed in the concentration calculator behind the color wheel. This will allow for comparison of the stain on the test strip and the color wheel.

7. Observe the stained test strip through the calculator window and rotate the color wheel to obtain a color match. Read the number on the color wheel and compare to the table on the back of the Concentration calculator.




For TDI read the concentration on the front of the calculator. If more samples are needed, repeat the process.

CAUTION -DO NOT REUSE TEST STRIPS REGARDLESS IF NO COLOR CHANGE HAS OCCURRED.

## 1.2 – Checking The Flow

Before sampling, or performing on a monthly basis, the flow should be checked with the provided flow meter.

F1) Connect the flow meter to the sample head as shown on the right.

NOTE: For TDI models connect to flowmeter as shown below

F2) To check the flow rate, start a sample as you would during normal sampling in step 1 above. The flow rate should be 1.5 LPM +/- 10%
with the center of the ball.


**NON – STANDARD TEST**: Where the concentration is lower than that provided for in a 5 minute test, the sample time can be modified to obtain a satisfactory measurement.

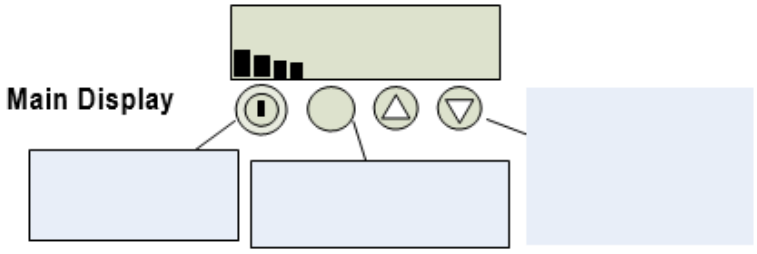
For low concentrations leave the test strip in the sample head and repeat the 5 minute sample. Remove the test strip and calculate as in a normal sample. The reading observed must be corrected by dividing by 2.

**Contact us for additional info or technical support.**

# Chapter 2 – IsoSense Pump Series Quick Start

## 2.1 – Introduction

NOTE: Connect a representative sampling filter cassette – using 1/4 inch tubing – to the pump to set Flow Rate for optimal performance.




Setting the Flow rate

1. Connect the sampling filter with a hose to the pump.
2. Turn on the pump by pressing the ON key.
3. Next press the down arrow to the Flow adjust Menu.
4. Press and hold the SET key and use arrows to adjust flow. (This clears all previous data).
5. Releasing the SET key will store the flow rate.
6. Press the ON/OFF key to return to Main Display, then press the up arrow (RUN) to begin sampling.

Pump calibration Adjustment, if needed at point of Flow Set

1. To measure the flow rate have a flow meter ready and connected to the filter.
2. From the Main Display down arrow to the Calibration Mode.
3. Press the SET key and release, pump begins to flow at preset flow rate from the steps above.
4. Measure flow, if it matches +/- 5% of setting, press the ON/OFF key and resume sampling. Press and hold the SET key to adjust the Factor for the pump speed to match desired flow rate.

# Chapter 3 – Design & Features

The main purpose of this battery-operated personal sampling pump is to draw contaminants from an air sample into, onto or through a sampling media such as 25 and 37mm filter cassettes, bubble impingers, long-duration color detector tubes to gauge personnel exposure to gases, vapors, particulates, aerosols, etc. Both the analytical method required for the contaminant and the types of contaminants sampled determine the selection of sampling media. Many sampling methods specify the use of filters for collection. (i.e. Asbestos and Lead). The pore size, filter diameter, and filter material affect the ability of the sample pump to draw air through the filter for contaminant collection.

The IsoSense Air Sampler consists of a pump contained in a Lexan case, exclusive and proprietary electronic circuit board for flow control, an LCD display with 2 lines of 16 characters, a single diaphragm pump mechanism and a rechargeable nickel metal hydride battery pack.

**Features:**

- Flow Compensation for filter plugging and battery voltage
- Compact, Rugged and quiet
- No tools required to change flow rates.
- Battery pack rechargeable while attached or separately
- Stainless steel belt clip with built-in tripod connector
- One-hour rechargeable batteries and optional extended run triple packs
- High impact Lexan case, antistatic and RFI shielded
- "Auto-restart" within one minutes of a flow fault
- Flows up to 4 LPM for special cyclone requirements
- Dual flow range easily handles filters, impingers, cyclones, and tubes
- High backpressure capable for 25mm 0.45 u asbestos filters
- Built in washable stainless steel 100 micron filter
- Displays: elapsed time, accumulated volume and flow rate
- Accuracy +/- 5% of display reading or pump Flow Faults
- Count down timer up to 40 hours, turns off pump.
- Key pad lock system
- One year warranty

# Chapter 4 – Pump Specifications

**Model:** IsoSense Pump

**Flow Range:** 0.8-4 LPM (800-4000 cc/min)
5—800 cc/min with Universal Low Flow Holder P.N. APB-109030

**Compensation Range:**
4000 cc/min up to 10" water back pressure
3500 cc/min up to 20" water back pressure
3000 cc/min up to 30: water back pressure
2500 cc/min up to 35: water back pressure
2000 cc/min up to 35: water back pressure
1500 cc/min up to 25: water back pressure
1000 cc/min up to 25: water back pressure
800 cc/min up to 15: water back pressure
**Accuracy:** 5% or less of Compensation Range back pressure

**Run Time:**

| Flow Rate cc/min | 37 mm 0.8u | 25mm 0.8u | 25mm 0,45u |
|---|---|---|---|
| 2000 | 43 hours | 29 hours | 12 hours |
| 2500 | 32 hours | 20 hours | 9 hours |
| 3000 | 22 hours | 14 hours | |
| 3500 | 16 hours | 11 hours | |
| Low Flow using Universal Low Flow Holder | | | |
| 5 to 800 | 24 hours | | |

**Data Storage:** Last flow rate, elapsed clock time and accumulated volume is saved into memory until cleared for next sampling.

**Display:** Back-lighted LCD with 2 lines by 16 Characters
**Normal Operation:** Battery Level, Flow Rate, Elapsed Time, Volume Collected, Timer
**Flow Fault Displays:** Flow Fault, or Filter Off
**5 Menu Displays:** Adjust Flow, Clear Data, Calibration, Timer, Key Pad Lock option

**Flow Faults**
Flow Fault for blockage of hose/filter and greater than +/-5% for flow of 2000 to 3500cc/m with Auto-Restart for one minute, then turns off pump with data saved. Filter OFF detects hose or filter has come off, stops pump and saves data. Pump turns OFF in 5 minutes.

**Power Supply:**
Standard Pack (single), NiMH Batteries: 4.8V, 2.15 Ah
Triple Pack, NiMH Batteries 4.8V, 6.45 Ah
Recharge Time: QuickOne and QuickFive Chargers
Standard Pack 1 Hour
Triple Pack 3 Hours
Quick-Chargers: input voltage 100 to 240 VAC
A/C adapter/ overnight Charge 110 VAC or 240 VAC

**Approvals:**
CE EMC Directive (EMCD) 89/336/EEC
UL and cUL (pending)
ATEX (pending)

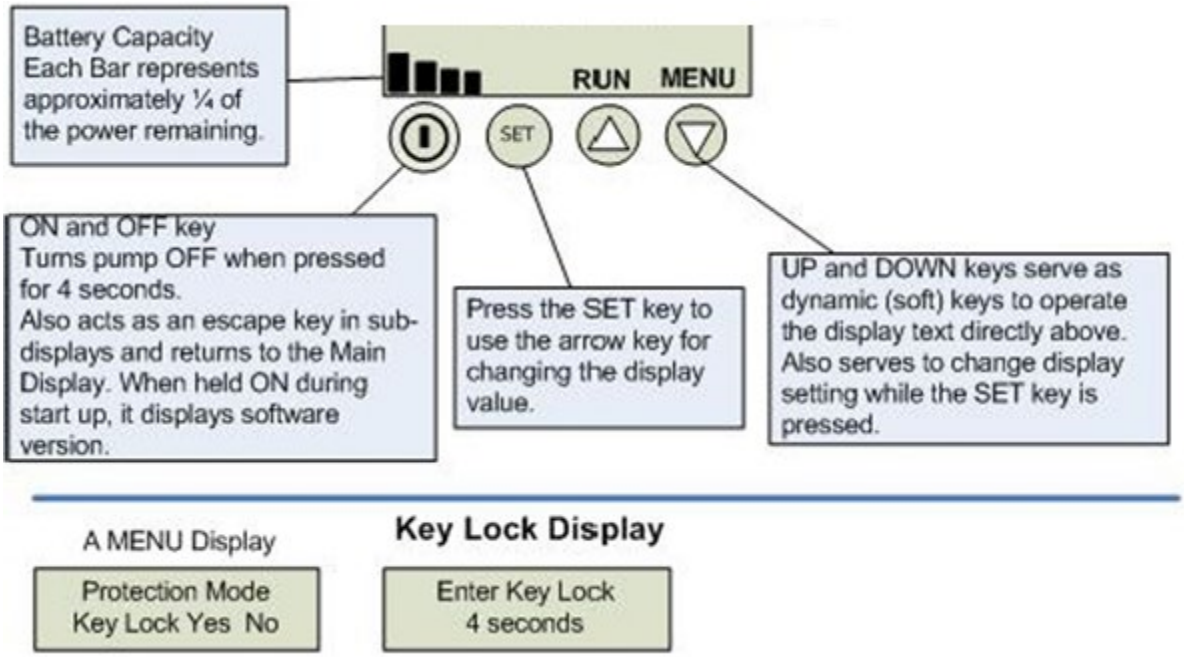
**Temperature:**
Operating: 32°F to 113°F (0°C to 45°C)
Storage: 32°F to 113°F (0°C to 45°C)
Charging: 41°F to 104°F (5°C to 40°C)

**Case:**
Polycarbonate steel fiber filled, RFI/EMI-shielded

**Size:**
4.5"H x 4"W x 2"D (11.4 cm H x 10.2 cm W x 5 cm D)

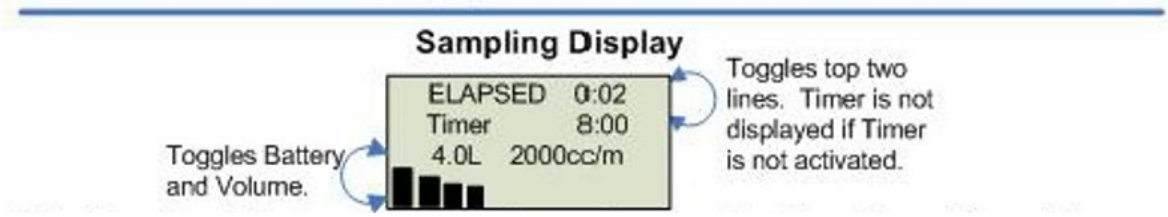
**Weight:**
16 oz (453g)

# Chapter 5 – Pump Displays

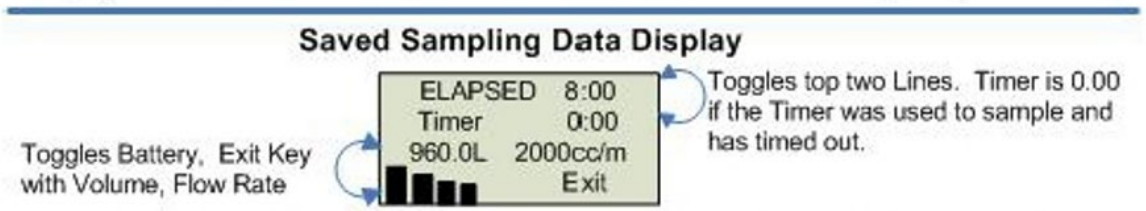



The Keypad Lock is activated from the MENU "Protection Mode Keypad Lock". Only during sampling does it function when activated. To unlock the proper key 'sequence must be pressed within 4 seconds. Unsuccessful unlock will return to the: sampling display.

Unlock is by pressing the keys one at a time from left to right all four). 1st ON/OFF 2nd SET 3rd UP arrow 4th Down arrow Unlocked returns to Main Display for turn off. It will relock when Run is started.



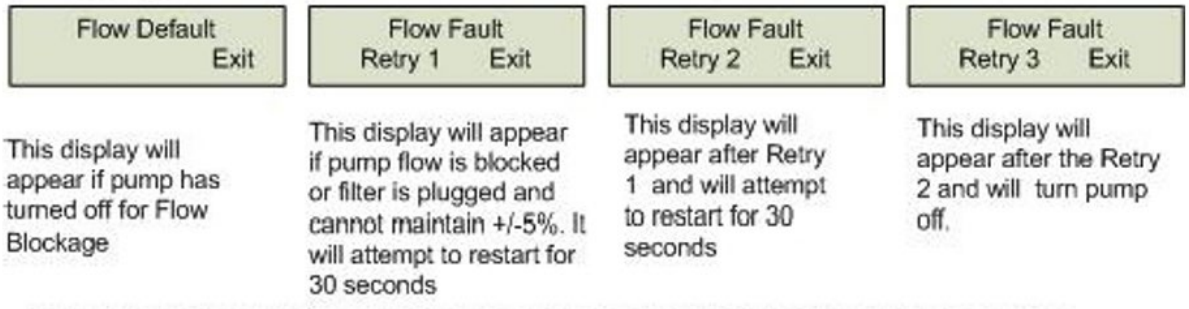

The Sampling Display remains on the entire sampling time. To exit from Run Mode press the ON/OFF key for 4 seconds. If the Key Lock is activated the unlock code must be entered first, then the pump will stop and return to the Main Display. Press the ON/OFF for a 4 second count down to tum pump off.




This display appears first when the pump has been stopped and turned off. The pump motor is off to enable the saved sampling data to be reported. Pressing the Exit key (down key) will return to the Main Display To allow resumption or setting of the pump.

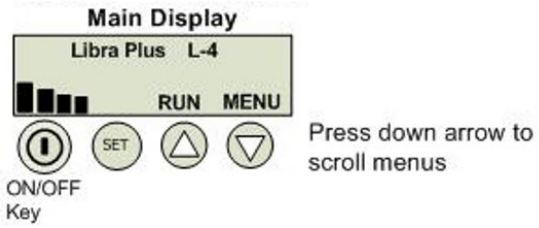
## Flow Fault Displays

Flow Fault will occur when the pumps constant flow control system cannot maintain the flow at -/+ 5% of the set point. There are two events that cause Flow Fault, Flow Blockage and Filter Off. Either of these events stops the pump and saves the sampling data until conditions are cleared to resume Sampling.

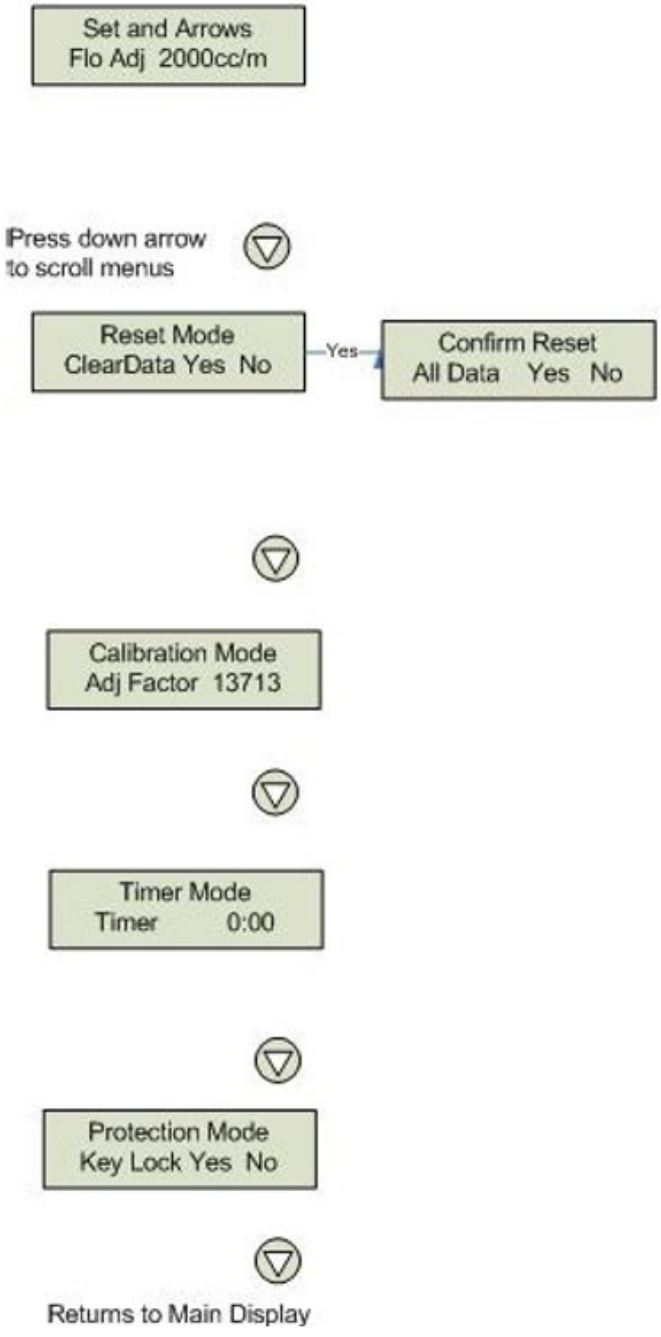



Flow Blockage will stop pump and sequence through the 3 retries as shown above. After a minute it turns the pump off. When the pump is restarted, it will return to the first display, press the down key to Exit. Automatic restart will be attempted during the Fault Display. If during the attempted restarts the flow can resume the pump goes back to the Sampling Display.


Filter OFF will be displayed in the sampling after or hose has become disconnected. Pressing the Exit down key will return to the Main Display. In Filter Off display the The pump will turn OFF after five minutes. Pump sampling data is saved in memory. Replacing the filter/hose and pressing the Run key in the Main Menu will resume Sampling.




## MENUS




Press and hold the SET key while using the arrows to change the flow on the display. Selectable flows are from 800 to 5000 cc/min. Changing the flow automatically clears the previous data. After selecting a flow press the ON/OFF to return to the Main Display. Then press Run (up arrow) to begin sampling. Pressure Mode is below 800 cc/m, See Chapter 6.

To clear data with the same flowrate press and hold the SET key and the up-arrow key. A warning display will ask for a second Yes. Yes, clears elapsed time, volume clears the Timer and goes to the Main Display. NO returns to Reset Mode.

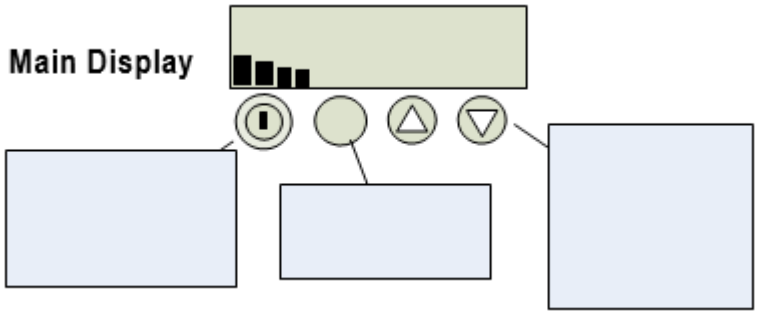
Calibration Mode is where the selected flow rate is measured against a calibrator to verify it matches the Run Mode flow within +/- 5%. The number shown on this display is an arbitrary number which is a factor used to provide constant flow.

Timer mode. Select time using arrow for pump to run and turn off automatically. Times up to 40:00 hours may be selected. The pump must be manually started, there is no wake up and run feature. Setting the timer clears data automatically.

Protection mode will require the sequence of pressing the keys in a 1,2,3,4, (left to right once) to make the pump turn off. Run mode is the only place this key lock functions. The pump will still stop for flow fault, Timer Off and low battery.

# Chapter 6 – Filter Cassette Sampling

Note: Connect a representative sampling filter cassette using ¼ inch tubing to the pump prior to setting Flow.




Setting the Flow rate

1. Connect sampling filter with a hose to the pump.
2. Turn on the pump by pressing the ON key.
3. Next press the down arrow to the Flow adjust Menu.
4. Press and hold the SET key and use arrows to adjust flow (This clears all previous data).
5. Releasing the SET key will store the flow rate.
6. Press the ON/OFF key to return to Main Display, then press the up arrow (RUN) to begin sampling.

To clear all sampling data and sample at the previous flow rate, from the Main Display press the downarrow key twice to the "Clear Data Menu". Press and hold the SET key and press
the up key for Yes clear data. Press the ON/OFF key to return to the Main Display and press up arrow to begin sampling.

Pump calibration Adjustment if needed at point of Flow Set

1. To measure the flow rate have a flow meter ready and connected to the filter.
2. From the Main Display down arrow to the Calibration Mode.
3. Press the SET key and release, pump begins to flow at preset flow rate from the steps above.
4. Measure flow, if it matches +/- 5% of setting, press the ON/OFF key and resume sampling.

Press and hold the SET key to adjust the Factor for the pump speed to match desired flow rate.

5. Press ON/OFF to return to Main Display and begin sampling.

# Chapter 7 – Battery Chargers & A/C Power Supply

**Note: The IsoSense Battery Chargers are designed to charge only the Nickel Metal Hydride (NiMH) battery packs for the IsoSense Pumps.**

IsoSense Battery Chargers
The charger is designed to operate from a 120 VAC. The charger begins operation automatically when plugged in to an AC source.

Standard Charger
The Standard Charger is designed to charge the IsoSense pump NiMH battery single pack in 16 hours. The connection is made through the charge port on the rear bottom of the battery pack. The RED LED light on the A/C charger will light. After 16 hours, the pump batteries will be fully recharged for portable operation. The battery pack can be charged either on or off the pump.
**Note: The Standard Charger is not recommended for the Triple Packs.**

A/C Power Supply
The Standard Battery Charger, for the IsoSense pump, will supply enough power to operate the IsoSense Pump continuously while sampling. Simply plug the charger into the battery pack and 120 VAC outlet and turn the pump on to sample.

**Caution: Never charge batteries in hazardous areas.**

# Chapter 8 – Service & Support

Contact DOD Technologies for product assistance and technical support:

## Phone Support
M-F 8:30am – 5pm (Central Time Zone-U.S.A.)
**815.788.5200**

## International Headquarters
675 Industrial Drive, Bldg. A.
Cary, IL 60013

## E-mail us at:
solutions@dodtec.com

## Visit our website:
DODtec.com

**For permanent discontinuation:**
Discontinued units may be eligible for recycling. Please contact DOD Technologies for additional information and instructions for arranging safe return of your equipment.

# Appendix A – Parts & Accessories

## Personal Disocyanates Detection Kits

| PART NUMBER | PART DESCRIPTION |
|---|---|
| 1-001-000 | IsoSense Personal MDI Detection Kit |
| 1-001-100 | IsoSense Personal TDI Detection Kit |
| 1-001-001 | IsoSense Pump Unit (Includes Charger) |

| PART NUMBER | PART DESCRIPTION |
|---|---|
| D2780-0010 | TDI/MDI Test Card |
| 1-000-558 | Isocyanate test strips (Pack of 20) |
| 1-200-241 | MDI Estimator (color strip) |
| 1-200-231 | TDI Estimator (color strip) |
| 1-001-002 | IsoSense Wall Charger (120V) |
| 1-001-003 | IsoSense Wall Charger (230V) |
| 1-000-700 | Calibration Flow Meter (2.5 LPM) |
| 2780-0350 | MDI Anodized Card Holder (with tubing) |
| 2780-0300 | TDI Anodized  Card Holder (with tubing) |
| 1-001-016 | IsoSense Replacement Battery Pack |

# Appendix B – Warranty

The seller warrants to the Purchaser that any equipment manufactured by it and bearing its name plate to be free from defects in material or workmanship, under proper and normal use and service, as follows: if, at any time within 1 year from the date of sale, the Purchaser notifies the Seller that in his opinion, the equipment is defective, and returns the equipment to the Seller's originating factory prepaid, and the Seller's inspection finds the equipment to be defective in material or workmanship, the Seller will promptly correct it by either, at its option, repairing any defective part or material or replacing it free of charge and return shipped lowest cost transportation prepaid (if Purchaser requests premium transportation, Purchaser will be billed for transportation costs). If inspection by the Seller does not disclose any defect in material or workmanship, the Seller's regular charges will apply. This warranty shall be effective only if installation and maintenance is in accordance with our instructions and written notice of a defect is given to the Seller within such period. This warranty is exclusive and is in lieu of any other warranties, written, oral or implied; specifically without limitation, there is no warranty of merchantability or fitness for any purpose. The liability of the Seller shall be limited to the repair or the replacement of materials or parts as above set forth.

LIMITATION OF LIABILITY
The seller shall not be liable for any claim for consequential loss or damage arising or alleged to have risen from any delay in delivery malfunction or failure of the equipment. The Seller's liability for any other loss or damage arising out of or connected with the manufacture, sale or use of the equipment sold, including damage due to negligence, shall not in any event exceed the price of the equipment supplied by us.

DOD Technologies, Inc. reserves the right to make changes at any time, without notice, in prices, colors, materials, specifications, and models; and to discontinue models.