UPC·MARATHON

ATMOSENSE™
Single Gas Atmosphere Analyzer
User Manual

FIXED-MOUNT PORTABLE

CONNECT WITH US

MASTERING
STRENGTH.
WORLDWIDE.

MANUAL #: 106

Revision #	Revision Date	Revision Description
003	October 25, 2019	

THIS MANUAL IS SUPPLIED ELECTRONICALLY.

COPYRIGHT(C)

DISCLAIMER:

The **AtmoSense™** is to be used by the industrial operator under his/her direction. UPC-Marathon is not responsible or liable for any product, process, damage or injury incurred while using the **AtmoSense™**. UPC-Marathon makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties or merchantability or fitness for any purpose.

WARRANTY:

UPC-Marathon warrants its goods as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to UPC-Marathon during the period of coverage, UPC-Marathon will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a

particular purpose. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

UPC-Marathon warrants products for a period of one (1) year from the date of shipment from UPC-Marathon to the original purchaser to be free from defects in material and workmanship under normal recommended use, service, inspection, and maintenance. Normal recommended use, service, inspection, and maintenance, mean:

1. Not to be used in excess of nor below the rated capacity, pressure, and temperature ranges specified in the applicable quotation, purchase order, acknowledgment, marketing literature, nameplate, specification sheet, or the Installation, Operation, Inspection, and Maintenance Manual (THE MANUAL); and

2. Using only clean gases free of solids and other contaminants not considered constituents of the gas; and

3. Installation, operation, inspection, and maintenance in compliance with THE MANUAL; and

4. The UPC-Marathon products being used only in:

    a. Ambient environments lower than 132 °Fahrenheit (54 °Celsius) unless specifically designed and so labeled by UPC-Marathon for higher temperatures; and
    b. Non-corrosive environments; and
    c. Completely protected from moisture, rain, snow, or other outside environments; and
    d. Not to be used below 32 °Fahrenheit (0 °Celsius) unless precautions are taken for low temperature conditions as shown in THE MANUAL.

5. Being used only for applications permitted by THE MANUAL or other UPC-Marathon literature or special applications approved in a separate written authorization by UPC-Marathon.

WARRANTY EXCEPTIONS

This Warranty does not apply to damage caused by any or all of the following circumstances or conditions:

1. Freight damage;

2. Parts, accessories, materials, or components not obtained from nor approved in writing by UPC-Marathon;

3. Any consequential or incidental damages including but not limited to loss of use, loss of profits, loss of sales, increased costs, arising from the use of any product system or other goods or services manufactured, sold, or provided by UPC-Marathon;

4. Misapplication, misuse, and failure to follow THE MANUAL or other literature, instructions, or bulletins (including drawings) published or distributed prior to THE MANUAL.

The exclusive remedy under this Warranty or any other express warranty is the repair or replacement without charge for labor and materials of any UPC-Marathon parts found upon examination by UPC-Marathon to have been defective. Since certain UPC-Marathon equipment is heavy, bulky and not deliverable by U.S. mail or other parcel service, UPC-Marathon equipment may be returned only upon written consent of UPC-Marathon and then only to the location designated by UPC-Marathon. Generally such consent will be given only upon the condition that the customer assume and prepay all carrier charges and responsibility for damage in transit.

Purchasers of UPC-Marathon products, equipment, goods, or services waive subrogation on all items covered under their own or any other insurance.

DISCLAIMER

THIS WARRANTY IS EXCLUSIVE. UPC-MARATHON EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY PURPOSE.

No person, including dealer, seller, or other representative of UPC-Marathon is authorized to make, on behalf of UPC-Marathon, any representations beyond those contained in UPC-Marathon literature and documents or to assume for UPC-Marathon any obligations or duties not contained in this Warranty and Warranty Policy.

UPC-Marathon reserves the right to make design and other changes, modifications or improvements to products, services, literature, or systems, without any obligation, to furnish or install same on any previously sold or delivered products or systems.

LIMITATION OF LIABILITY

It is expressly agreed that the liability of UPC-Marathon is limited and UPC-Marathon does not function as an insurer. The purchaser and/or user agree that UPC-Marathon is not liable for loss, harm, or damage due directly or indirectly to any occurrence or consequences there from. If UPC-Marathon should be found liable to anyone on any theory (except any express warranty where the remedy is set forth in Section 2 of this Warranty and Warranty Policy) for loss harm or damage, the liability of UPC-Marathon shall be limited to the lesser of the actual loss, harm or damage or the purchase price of the involved UPC-Marathon equipment or service when

sold (or when service performed) by UPC-Marathon to customer. This liability is exclusive and regardless of cause or origin resulting directly or indirectly to any person or property from:

1. The performance or nonperformance of any obligations set forth in this Warranty and Warranty Policy;

2. Any agreement including specifications between UPC-Marathon and the customer;

3. Negligence, active, passive or otherwise of UPC-Marathon or any of agents or employees;

4. Breach of any judicially imposed warranty or covenant of workmanship, durability or performance; and

5. Misrepresentation (under the Restatement, common law or otherwise) and/or strict liability involvement;

6. Liability for fraud-in-the-inducement.

WARRANTY FIELD SERVICE

If Warranty Field Service is rendered at the request of the purchaser or user and the difficulty is found not to be with UPC-Marathon's product, the purchaser shall pay the time and expense (at the prevailing rate at the time of the service) of UPC-Marathon's field representative(s). Charges for service, labor, and other expenses that have been incurred by the purchaser, customer, or agent without written approval of UPC-Marathon will not be accepted. The OEM or other reseller is responsible for transmitting installation and operating instructions, THE MANUAL or other service literature supplied by UPC-Marathon with the equipment.

TECHNICAL ASSISTANCE

For all questions or concerns regarding the operation of the **AtmoSense™**, please consult the last page of this manual for contact information.

Table of Contents

1 DESCRIPTION

The AtmoSense™ is a flexible process analyzer designed to provide real-time measurements of process gas variables in a wide variety of atmosphere control applications. The AtmoSense™ is available with a range of sensors and options to provide accurate measurement of dew point (DP), oxygen (O_2), methane (CH_4), propane (C_3H_8), hydrogen (H_2), carbon monoxide (CO), or carbon dioxide (CO_2). In addition, the AtmoSense™ is engineered to be easily serviceable, field calibrated, and comes standard with a color LCD display and industrial sealed inlet sample filter. These industrial analyzers can also be fitted with a sample pump to draw atmosphere samples in low pressure applications.

The AtmoSense™ product family is specifically designed for the industrial measurement of a sample gas. The unit is available with several options as outlined below:

AtmoSense™ Industrial Process Gas Analyzer Product Option Codes

			Product Code: ATMOSENSE -	-	-
1	**Gas Type**	Dew point (Range: -60 - 60°C)	DP		
		Hydrogen (Range: 0 - 100%vol)	H2		
		Methane (Range: 0 - 5.0%vol)	CH4		
		Methane (Range: 0 - 100%vol)	CH4a		
		Propane (Range: 0 - 2.1%vol)	C3H8		
		Propane (Range: 0 - 100%vol)	C3H8a		
		Carbon Monoxide (Range: 0.1 - 100%vol)	CO		
		Carbon Dioxide (Range: 0 - 2.0%vol)	CO2		
		Oxygen (Range: 0.0 – 25.0%)	O2		
		No Internal Sensor	NO		
2	**Build Options**	Basic Build (No Display, Signal Only)		BASIC	
		Color Display (24VDC Only)		DISP	
		Display and Universal AC Power Supply		DISPAC	
		Display, Universal AC Power, Process Controller		CTRL	
		Portable Kit (Includes Display, Universal AC Power with Battery)		PORT	
3	**Sample Pump**	No Internal Pump			NO
		Integrated Sample Pump			PUMP

2 SPECIFICATIONS

AtmoSense™ Sensor Specifications

AS-DP Dew Point
Technology.....IR
Range: .....-60 - 60°C
Accuracy:.....+-1.5% FS
AS-H_2 Hydrogen
Technology.....Diffusion
Range: 0-100%vol
Accuracy:.....+-1% FS
AS-CH_4 Methane LEL
Technology.....IR
Range: .....Range: 0.0-5.0%vol
Accuracy:.....+-2% FS
AS-CH_4a Methane %
Technology.....IR
Range: .....Range: 0-100%vol
Accuracy:.....+-2% FS
AS- C_3H_8 Propane LEL
Technology.....IR
Range: .....Range: 0.0-2.1%vol
Accuracy:.....+-2% FS
AS-C_3H_8a Propane %
Technology.....IR
Range: .....Range: 0-100%vol
Accuracy:.....+-2% FS
AS-CO Carbon Monoxide %
Technology.....IR
Range: .....Range: 0-100%vol
Accuracy:.....+-1% FS
AS-CO_2 Carbon Dioxide %
Technology.....IR
Range: .....Range: 0-2.0%vol
Accuracy:.....+-0.5% CO2

AS-O_2 Oxygen %

Technology	Catalytic
Range:	Range: 0.0-25.0%
Accuracy:	+-1% FS

Ambient Temperature Limits	32°-132°F
Minimum Sample Flow Rate	5 CFH (Non-Corrosive/Condensing*)
Maximum Sample Flow Rate	8 CFH (Non-Corrosive/Condensing*)

Minimum Power Requirements

ATMOSENSE-DISP:	2A @ 24VDC
ATMOSENSE-DISPAC:	1A @ 110VAC

Retransmission Signal

Voltage Output (ATMOSENSE-DISP)	1-5V (Default Scale -60°C - 60°C)
Amperage Output (ATMOSENSE-DISPAC)	4-20mA (Default Scale -60°C - 60°C)

Physical Dimensions

Fixed Models	10” H x 8” W x 6” D
Portable Models (ATMOSENSE-PORT)	10” H x 14” W x 8” D

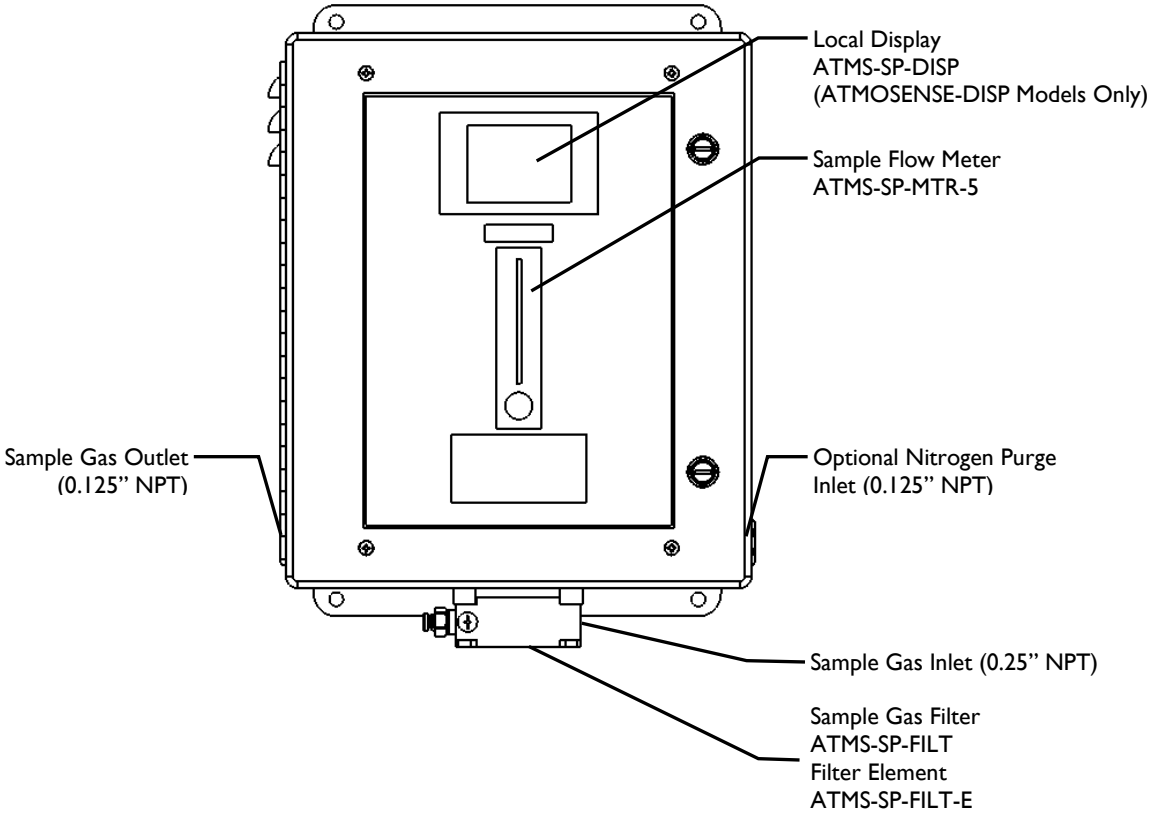
Battery Life (Portable Units)

Sample Pump Running	4 Hours Typical
Pump Disabled	14 Hours Typical

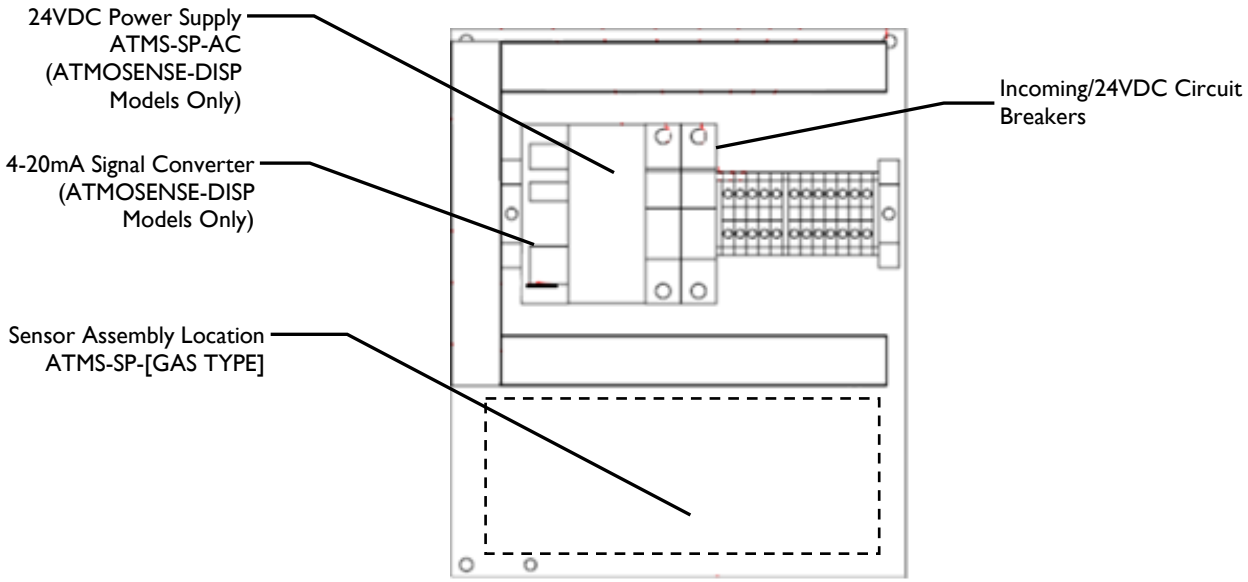
*Note that the AtmoSense™ is not intended for use with for corrosive sample gases including NH_3, SO_3, HCL, or Chlorine.

3 SYSTEM OVERVIEW

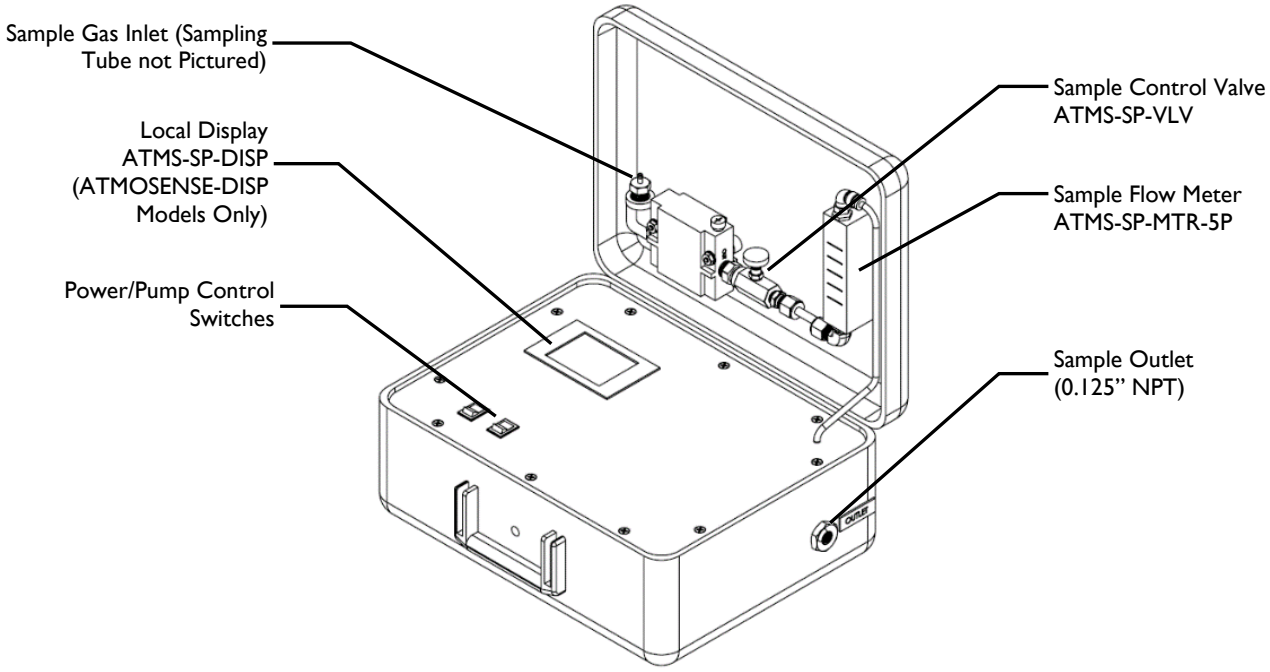
3.1 Fixed Configuration Component Overview



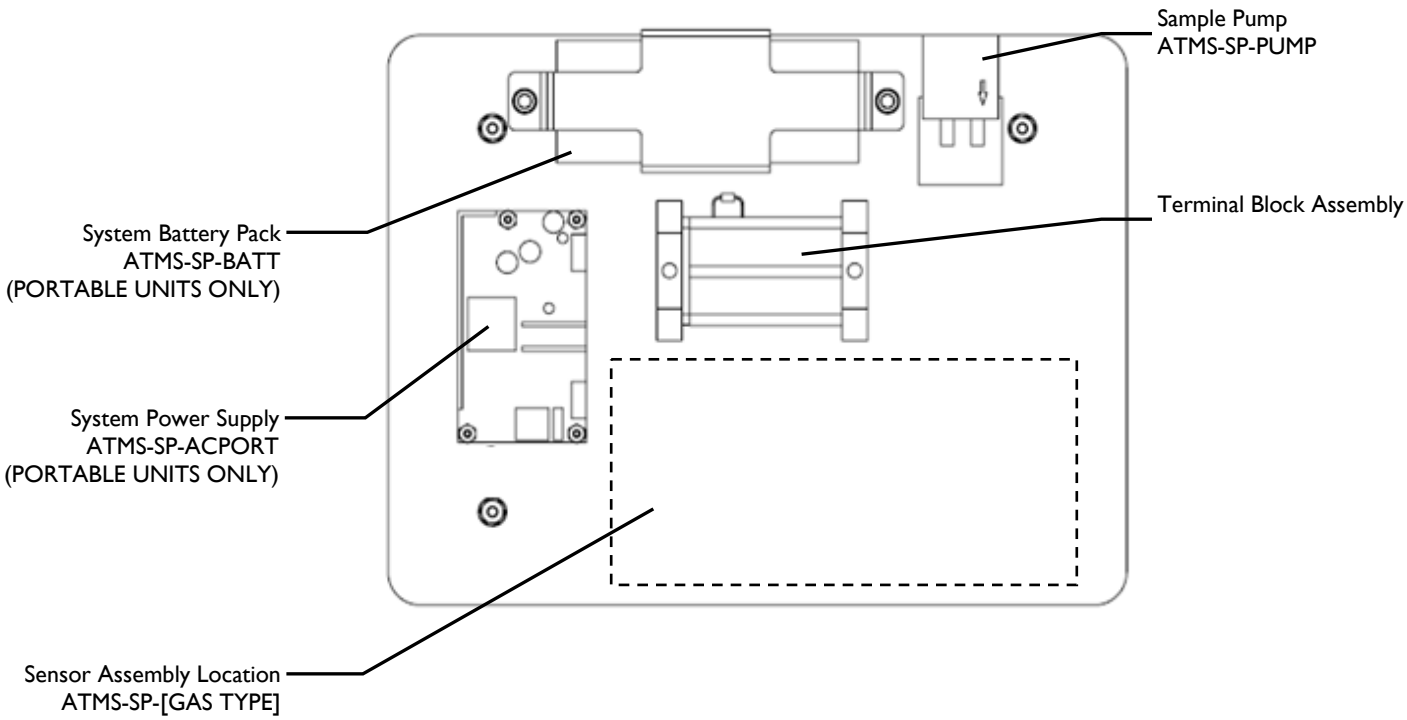
3.2 Fixed Configuration Subpanel Overview



3.3 Portable Configuration Component Overview



3.4 Portable Configuration Subpanel Overview



4 INSTALLATION

4.1 Mechanical Installation

The AtmoSense™ Gas Analyzer is shipped as a calibrated unit and ready to be mounted. Steps to complete the mechanical installation of the system are as follows:

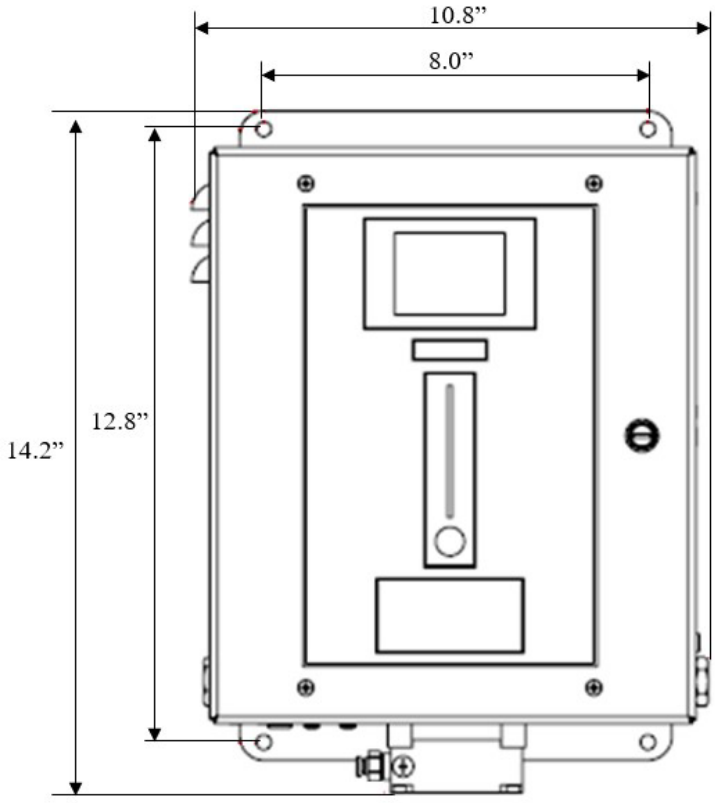
1. Inspect the system for any damaged or missing components and confirm the mounting location.

2. The system is to be mounted using the mounting holes as noted on the diagram below. Note the overall dimensions of the system detailed in the drawing(s). Do not mount the system in an environment that exceeds the rated temperature outlined in the specifications.

3. Identify the source of the sample gas and connect to the sample gas inlet.

4. Connect the sample gas outlet port to an appropriate vent location.

AtmoSense™ Fixed overall and mounting dimensions:



4.2 Electrical Installation

The AtmoSense™ is designed for easy electrical installation, and ½" conduit knockouts are provided for electrical connections to the unit.

1. Connect the incoming power to the unit.

ATMOSENSE-DISP
- Power Requirements: ..... 2A @ 24VDC
- Terminal Locations: ..... 24VDC POWER TO +V, -V, GND

ATMOSENSE-DISPAC:
- Power Requirements: ..... 1A @ 110-230VAC
- Terminal Locations: ..... 110VAC POWER TO L, N, GND

ATMOSENSE-PORT:
- Power Requirements: ..... 1A @ 110-230VAC
- Terminal Locations: ..... USES SUPPLIED POWER CABLE

2. If desired, connect the process variable retransmission signal per the unit wiring diagram.

ATMOSENSE-DISP (1-5VDC Signal)
- + Process Variable Signal: ..... Terminal 1410
- - Process Variable Signal:..... Terminal 1301 (Common to –VDC)

ATMOSENSE-DISPAC (4-20 mA Signal)
- + Process Variable Signal: ..... Terminal 1540
- - Process Variable Signal:..... Terminal 1530

ATMOSENSE-PORT (4-20 mA Signal)
- + Process Variable Signal: ..... Terminal 1540

- Process Variable Signal: Terminal 1530

5 SYSTEM OPERATION

5.1 Initial System Setup Procedure

The AtmoSense™ is designed as a robust industrial device, however precautions must be taken to handle the unit with care.

1) Verify that the Mechanical and Electrical Installation has been properly completed
2) Apply power to the unit
3) Verify that the ambient sensor reading is in line with standard conditions
4) Introduce sample gas to the unit at a flow rate of 5-6 CFH
    a. If the sample gas is not pressurized, turn on the sample pump to draw the sample through the unit
5) Allow for 30 minutes for the sensing unit to stabilize before recording readings

5.2 Initial Typical Operation Procedure

1) Apply power to the unit
2) Introduce sample gas to the unit at a flow rate of 5-6 CFH
    a. If the sample gas is not pressurized, turn on the sample pump to draw the sample through the unit
3) Allow for 60 seconds for the sensing unit to stabilize before recording readings
4) For portable units, turn off main power to prevent battery drain

6 RECOMMENDED MAINTENANCE

6.1 Maintenance

The AtmoSense™ is designed to be a robust and relatively maintenance free industrial instrument. However, to ensure the unit is operating properly the sample inlet filter should be changed on a regular basis (every 1-3 months depending on gas sample quality.) In addition, the unit should undergo a yearly calibration process to ensure the sensor is reading accurately. This can typically be done in the field or the unit can be sent back to UPC-Marathon for calibration.

Spare Parts List

AtmoSense System Spare Parts

	Part Number:
Spare Intake Filter Assembly	ATMS-SP-FILT
Spare Intake Filter Element (each)	ATMS-SP-FILT-E
Spare Intake Filter Element Package (Qty10)	ATMS-SP-FILT-E10
Spare Sample Pump	ATMS-SP-FILT-PUMP
Spare Meter (0-5CFH)	ATMS-SP-MTR-5
Spare Meter (0-10CFH)	ATMS-SP-MTR-10
Spare Meter (0-20CFH)	ATMS-SP-MTR-20
Spare Meter - Portable (0-5CFH)	ATMS-SP-MTR-5P
Spare Display	ATMS-SP-DISP
Spare Sensor: Dew point (Range: -60 - 60°C)	ATMS-SP-DP
Spare Sensor: Hydrogen (Range: 0 - 100%vol)	ATMS-SP-H2
Spare Sensor: Methane (Range: 0 - 5.0%vol)	ATMS-SP-CH4
Spare Sensor: Methane (Range: 0 - 100%vol)	ATMS-SP-CH4a
Spare Sensor: Propane (Range: 0 - 2.1%vol)	ATMS-SP-C3H8
Spare Sensor: Propane (Range: 0 - 100%vol)	ATMS-SP-C3H8a
Spare Sensor: Carbon Monoxide (Range: 0.1 - 100%vol)	ATMS-SP-CO
Spare Sensor: Carbon Dioxide (Range: 0 - 2.0%vol)	ATMS-SP-CO2
Spare Sensor: Oxygen (Range: 0 - 20%)	ATMS-SP-O2

6.2 Sensor Calibration Procedures

6.2.1 AtmoSense -DP Calibration Procedure

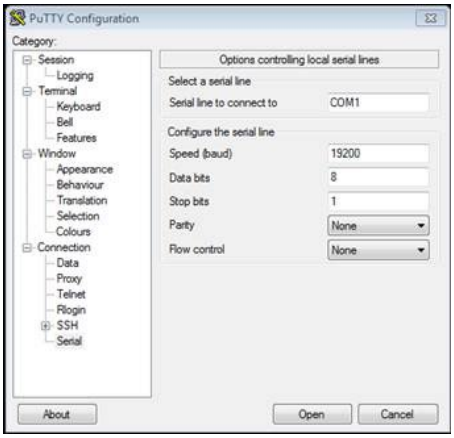
This procedure allows the user to apply a correction to the Dew Point sensor reading to compensate for offsets that have occurred over time:

Required Tools/Software:

- Calibration gas with a known dew point
- puTTy Terminal Software
- W-7571 4 Position M8 Cable
- E-4458 USB to RS485 Serial Converter

Procedure:
1) Ensure that the AtmoSense Dew Point is powered (green LED on sensor is on)

2) Connect the W-7571 Cable to the digital connector of the Dew Point Transmitter
3) Wire -485 (black) and +485 (wire) to the RS485 converter
4) Verify the com port # that has been assigned to the USB/RS485 Converter
5) Change the serial port settings on your computer to match the sensor:
    a) Baud = 19200
    b) Parity = None
    c) Data bits = 8
    d) Stop bits = 1
    e) Flow Control = None
6) Open the PuTTy application and set the settings under the serial tab to the same settings:
    a) Serial line to connect to = (Set to com port # from step 4)
    b) Baud = 19200
    c) Parity = None
    d) Data bits = 8
    e) Stop bits = 1
    f) Flow Control = None



7) Under the Terminal tab, enable the local echo/local line editing:
    a) Local echo – Force on
    b) Local line Editing – Force on
8) Open the connection
9) Type “?” then press enter and the terminal will display the sensor information
10) To offset the sensor:
    a) Type “LI” then press enter to see the user adjustment parameters
        i) Note that the only parameter recommended to adjust is the Tdf
    b) Press enter to scroll through the commands until prompted for “Tdf offset”
    c) Input the value of the “Tdf offset” and press enter
11) To change the sensor scaling:
    a) Type “ASEL” then press enter to see the analog output parameters and scaling
    b) Input the minimum scaling setting “-60” (or alternative if desired) and press enter
    c) Input the maximum scaling setting “60” (or alternative if desired) and press enter
    d) To leave the settings at previous press enter with no input
    e) The measurement range of the sensor is -60°C to 60°C.

When complete, exit the terminal application

6.2.2 AtmoSense -O_2 Calibration Procedure

Required Tools/Software:

- #2 Standard Screwdriver

Procedure:

1) Disconnect any sample gas from the AtmoSense inlet
2) While the sample pump is active, set the flow meter to 5 CFH of sample flow
3) Record the oxygen % on the screen
4) Adjust the span screw on the O_2 Sensor Board until the screen displays ambient levels of Oxygen (20.9%)
5) Cycle power to the unit and verify the reading

6.2.3 Additional Models

The following models must be returned to UPC-Marathon for factory calibration:

ATMOSENSE-H2
ATMOSENSE-CH4
ATMOSENSE-C3H8
ATMOSENSE-CO
ATMOSENSE-CO2

7 CUSTOMER SUPPORT

Americas	Asia	Europe
support.na@UPC-marathon.com	service@mmichina.cn	support.eu@UPC-marathon.com
USA: +1 414 462 8200	**Shanghai:** +86 21 3463 0376	**France**: +33 3 81 48 37 37
Canada: +1 514 335-7191	**Beijing:** +86 10 8217 6427	**Germany**: +49 7161 94888-0
		Poland: +48 32 296 66 00

Reach us at www.nitrex.com

UPC-Marathon, A Nitrex Company, brings together leading brands to the heat-treating industry including Atmosphere Engineering, Furnace Control, Marathon Monitors and Process-Electronic, and Waukee Engineering. We provide prime control solutions through our worldwide sales and services network with easy-to-access local support.