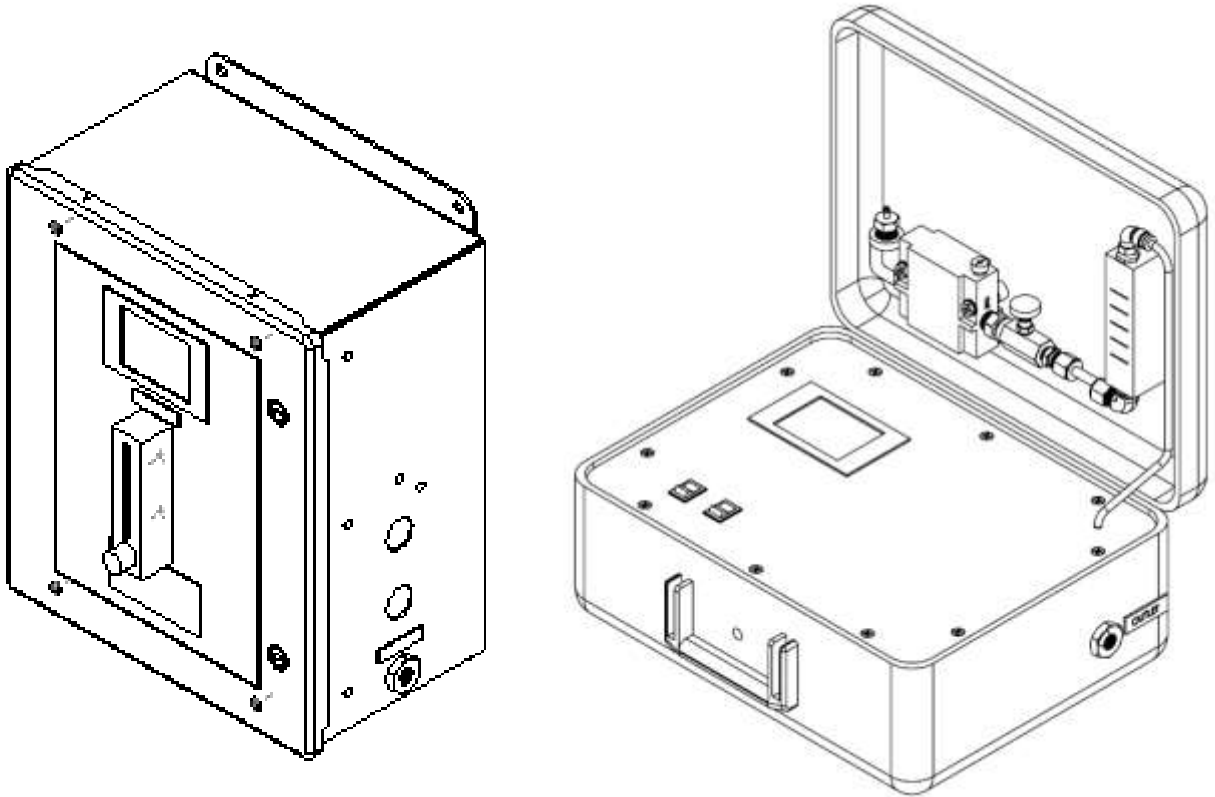


ATMOSENSE™ INSTALLATION AND OPERATION MANUAL



Document Control - Revision Notes

<u>Rev</u>	<u>Date</u>	<u>Technician</u>	<u>Revision Description</u>
R0	03/29/15	David Raschke	Product Manual Updated for Release

TABLE OF CONTENTS

NOTICE 3
EXPRESS WARRANTY ON ATMOSPHERE ENGINEERING EQUIPMENT 4
DESCRIPTION 6
PRODUCT PART NUMBERS 6
SPECIFICATIONS..... 7

SYSTEM OVERVIEW
FIXED SYSTEM OVERVIEW 9
PORTABLE SYSTEM OVERVIEW 10

INSTALLATION
MECHANICAL INSTALLATION 11
ELECTRICAL INSTALLATION..... 12

SYSTEM OPERATION
INITIAL SETUP 13
TYPICAL OPERATION 13

MAINTENANCE
MAINTENANCE..... 14
SENSOR CALIBRATION PROCEDURES..... 15

ADDITIONAL DOCUMENTATION
AtmoSense™ Wiring Drawing
AtmoSense™ Mechanical Drawing

NOTICE, CAUTIONS, AND WARNINGS

NOTICE

This Bulletin contains important safety information and should be read and understood by all individuals who install, operate, or service this equipment.

Failure to follow the precautions and recommendations of this manual may subject personnel and property to dangerous conditions.

TECHNICAL ASSISTANCE

Contact Atmosphere Engineering with all questions or concerns regarding the installation, operation, and setup of the AEC AtmoSense™.

Atmosphere Engineering Company
419 West Boden Street
Milwaukee, Wisconsin 53207
United States of America

Phone: 414-331-2457

Fax: 414-332-2457

E-Mail: support@atmoseng.com

EXPRESS WARRANTY ON ATMOSPHERE ENGINEERING EQUIPMENT

ATMOSPHERE ENGINEERING COMPANY (AEC) warrants products for a period of one (1) year from the date of shipment from AEC 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 AEC products being used only in:
 - a. Ambient environments lower than 132 °Fahrenheit (54 °Celsius) unless specifically designed and so labeled by AEC 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 AEC literature or special applications approved in a separate written authorization by AEC.

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 AEC;
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 AEC;
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 AEC parts found upon examination by AEC to have been defective. Since certain AEC equipment is heavy, bulky and not deliverable by U.S. mail or other parcel service, AEC equipment may be returned only upon written consent of AEC and then only to the location designated by AEC. 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 AEC products, equipment, goods, or services waive subrogation on all items covered under their own or any other insurance.

(CONTINUED ON NEXT PAGE)

EXPRESS WARRANTY ON ATMOSPHERE ENGINEERING EQUIPMENT

(CONTINUED FROM PREVIOUS PAGE)

DISCLAIMER

THIS WARRANTY IS EXCLUSIVE. AEC 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 AEC is authorized to make, on behalf of AEC, any representations beyond those contained in AEC literature and documents or to assume for AEC any obligations or duties not contained in this Warranty and Warranty Policy.

AEC 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 AEC is limited and AEC does not function as an insurer. The purchaser and/or user agree that AEC is not liable for loss, harm, or damage due directly or indirectly to any occurrence or consequences there from. If AEC 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 AEC shall be limited to the lesser of the actual loss, harm or damage or the purchase price of the involved AEC equipment or service when sold (or when service performed) by AEC 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 AEC and the customer;
3. Negligence, active, passive or otherwise of AEC 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 AEC's product, the purchaser shall pay the time and expense (at the prevailing rate at the time of the service) of AEC'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 AEC 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 AEC with the equipment.

(END OF WARRANTY TEXT)

ATMOSENSE™ INSTALLATION AND OPERATION MANUAL

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 (O2), methane (CH4), propane (C3H8), hydrogen (H2), carbon monoxide (CO), or carbon dioxide (CO2). 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

SPECIFICATIONS

AtmoSense Sensor Specifications

AS-DP Dew Point

Technology IR
Range: -60 - 60°C
Accuracy: +/-1.5% FS

AS-H2 Hydrogen

Technology Diffusion
Range: 0-100%vol
Accuracy: +/-1% FS

AS-CH4 Methane LEL

Technology IR
Range: Range: 0.0-5.0%vol
Accuracy: +/-2% FS

AS-CH4a Methane %

Technology IR
Range: Range: 0-100%vol
Accuracy: +/-2% FS

AS- C3H8 Propane LEL

Technology IR
Range: Range: 0.0-2.1%vol
Accuracy: +/-2% FS

AS-C3H8a 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-CO2 Carbon Dioxide %

Technology IR
Range: Range: 0-2.0%vol
Accuracy: +/-0.5% CO2

AS-O2 Oxygen %

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

(CONTINUED ON NEXT PAGE)

ATMOSENSE™ INSTALLATION AND OPERATION MANUAL

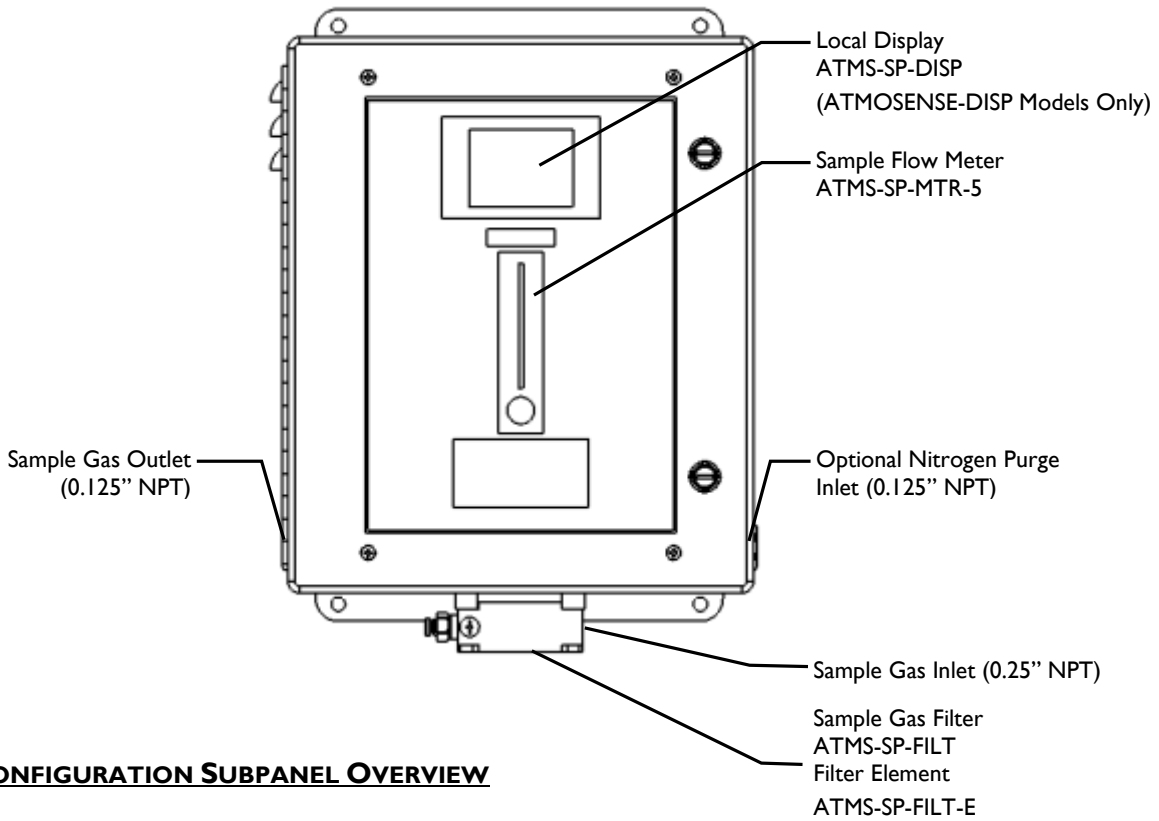
<u>Ambient Temperature Limits</u>	32° - 132°F
<u>Minimum Sample Flow Rate</u>	1 CFH (Non Corrosive/Condensing*)
<u>Maximum Sample Flow Rate</u>	5 CFH (Non Corrosive/Condensing*)
<u>Minimum Power Requirements</u>	
ATMOSENSE-DISP:	2A @ 24VDC
ATMOSENSE-DISPAC:	1A @ 110VAC
<u>Retransmission Signal</u>	
Voltage Output (ATMOSENSE-DISP).....	1-5V (Default Scale -60°C - 60°C)
Amperage Output (ATMOSENSE-DISPAC)	4-20mA (Default Scale -60°C - 60°C)
<u>Physical Dimensions</u>	
Fixed Models	10" H x 8" W x 6" D
Portable Models (ATMOSENSE-PORT).....	10" H x 14" W x 8" D
<u>Battery Life (Portable Units)</u>	
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 NH₃, SO₃, HCL, or Chlorine.

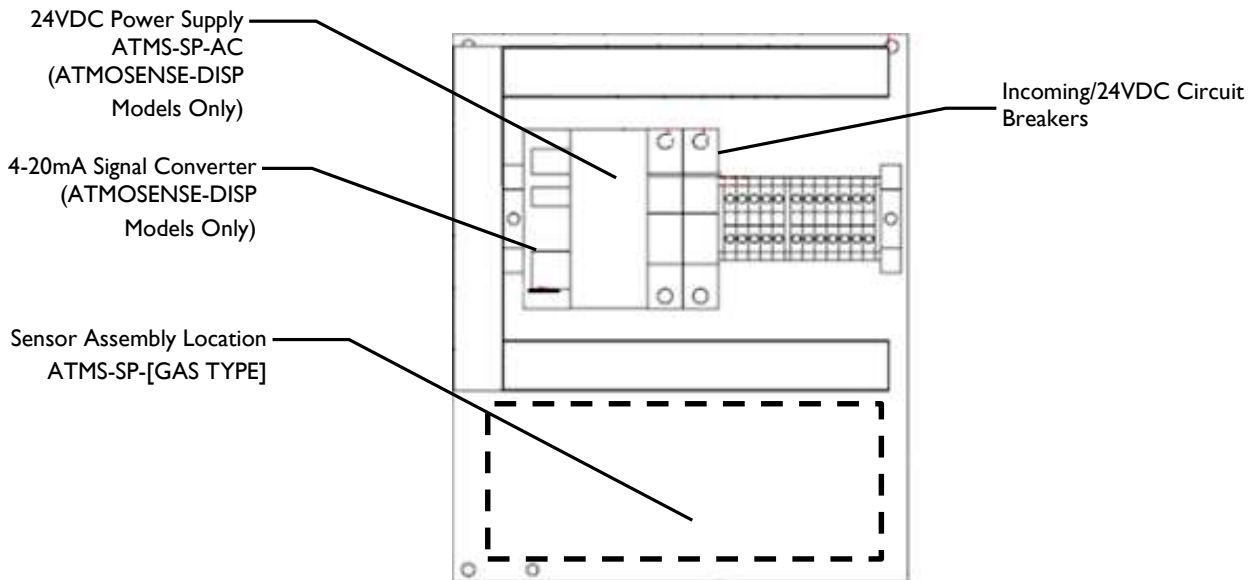
(THE REST OF THIS PAGE HAS BEEN LEFT BLANK)

SYSTEM OVERVIEW

FIXED CONFIGURATION COMPONENT OVERVIEW

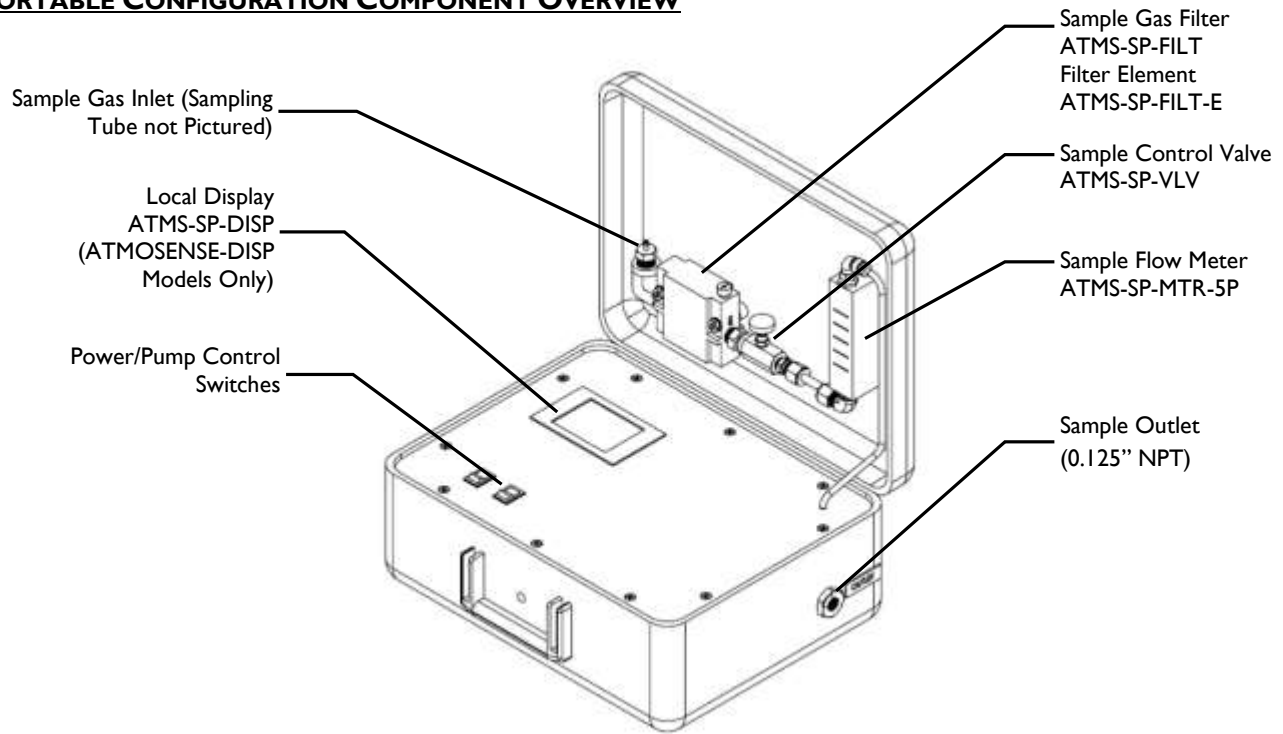


FIXED CONFIGURATION SUBPANEL OVERVIEW

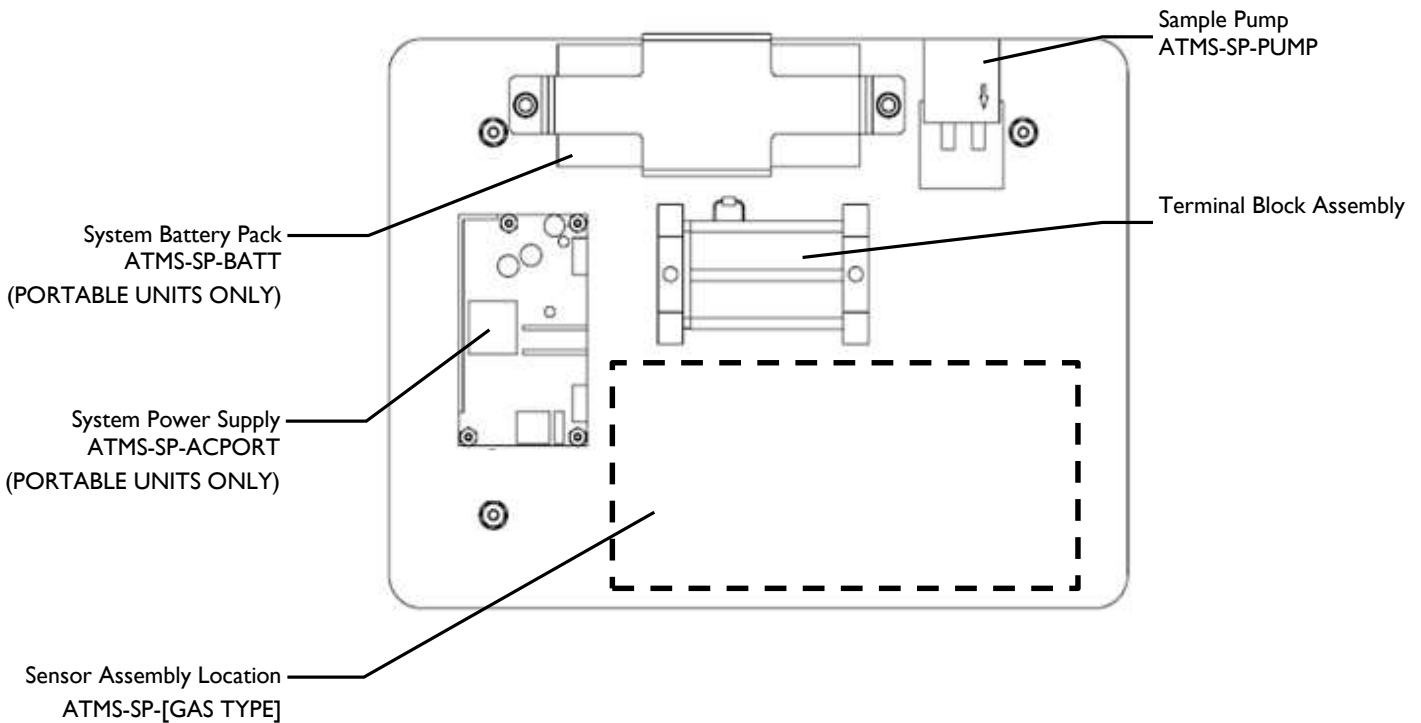


SYSTEM OVERVIEW CONT.

PORTABLE CONFIGURATION COMPONENT OVERVIEW



PORTABLE CONFIGURATION SUBPANEL OVERVIEW

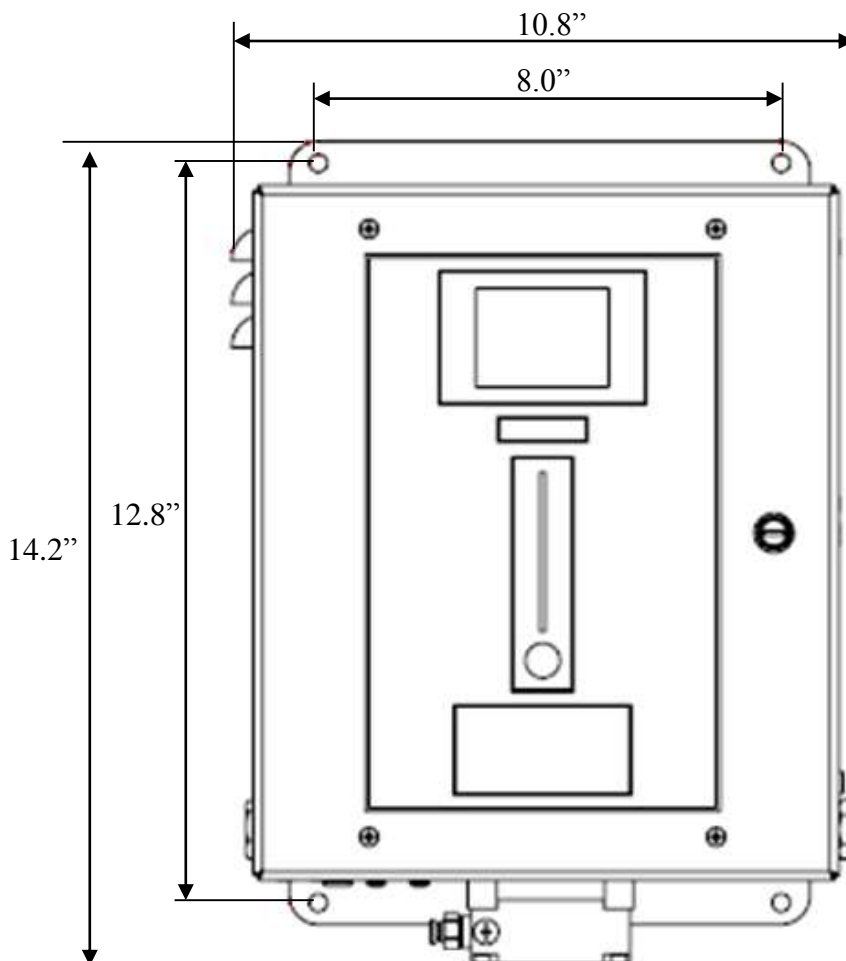


MECHANICAL INSTALLATION

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:



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 I410
- Process Variable Signal:.....Terminal I301 (Common to -VDC)

ATMOSENSE-DISPAC (4-20 mA Signal)

+ Process Variable Signal:Terminal I540
- Process Variable Signal:.....Terminal I530

ATMOSENSE-PORT (4-20 mA Signal)

+ Process Variable Signal:Terminal I540
- Process Variable Signal:.....Terminal I530

(THE REST OF THIS PAGE HAS BEEN LEFT BLANK)

SYSTEM OPERATION

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 1-2 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

Typical Operation Procedure

- 1) Apply power to the unit
- 2) Introduce sample gas to the unit at a flow rate of 1-2 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

(THE REST OF THIS PAGE HAS BEEN LEFT BLANK)

RECOMMENDED 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 AEC 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

SENSOR CALIBRATION PROCEDURES

ATMOSENSE-DP Calibration Procedure

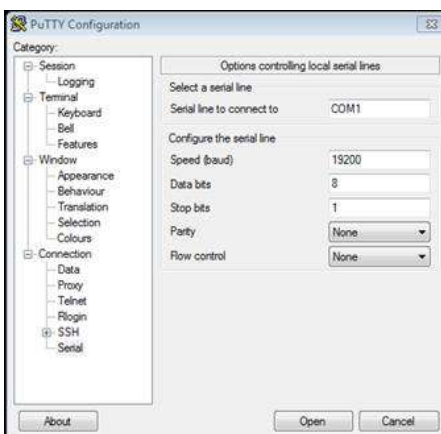
This procedure allows the user to apply a correction to the Dew Point sensor reading to compensate for offsets that have occurred over time:

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 “L1” 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.
- 12) When complete, exit the terminal application

ATMOSENSE-O2 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 1 CFH of sample flow
- 3) Record the oxygen % on the screen
- 4) Adjust the span screw on the O2 Sensor Board until the screen displays ambient levels of Oxygen (20.9%)
- 5) Cycle power to the unit and verify the reading

ADDITIONAL MODELS

The following models must be returned to AEC for factory calibration:

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