HP125 Series & DCM™

OPERATORS MANUAL

Rev D July 2018

Edgetech Instruments

ISO 9001:2008 Registered
ISO/IEC 17025:2005 Accredited

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QUICK STARTUP GUIDE

Safety

Electrical and compressed Gas Hazards

The HP125 delivered to you has been tested for safety, calibrated and approved as shipped from the factory. Note the following precautions:

CAUTION	Do not modify the unit. Improper modification can damage the product or lead to malfunction.

CAUTION	The transmitter body does not have user serviceable parts inside, and is not designed to be opened. Opening the transmitter will void the warranty.

ESD Protection

Electrostatic Discharge (ESD) can cause immediate or latent damage to electronic circuits. Edgetech Instruments products are adequately protected against ESD for their intended use. It is possible to damage the product, however, by delivering electrostatic discharges when touching, removing, or inserting any objects inside the equipment housing.

1. To make sure you are not delivering high static voltages yourself when handling the replaceable sensor tip PCB
2. Handle ESD sensitive components on a properly grounded and protected ESD workbench.
3. When an ESD workbench is not available, ground yourself to the equipment chassis with a wrist strap and a resistive connection cord.
4 If you are unable to take either of the above precautions, touch a conductive part of the equipment chassis with your other hand before touching ESD sensitive components.

Always hold component boards by the edges and avoid touching the component contacts.

When the Probe is first introduced into the process it will need a period of time for the materials to dry down before the sensor reads Dew Point and RH correctly.
During installation process the probe will have been exposed to ambient conditions. The stainless steel filter and the tip PCB will have absorbed some moisture.
Once installed in the process any entrained moisture will be drawn off by the process gas and the unit will quickly reach equilibrium.

The initial RH and Dew Point values displayed when first installed may be misleading

WHEN USING PROBE with CABLE.

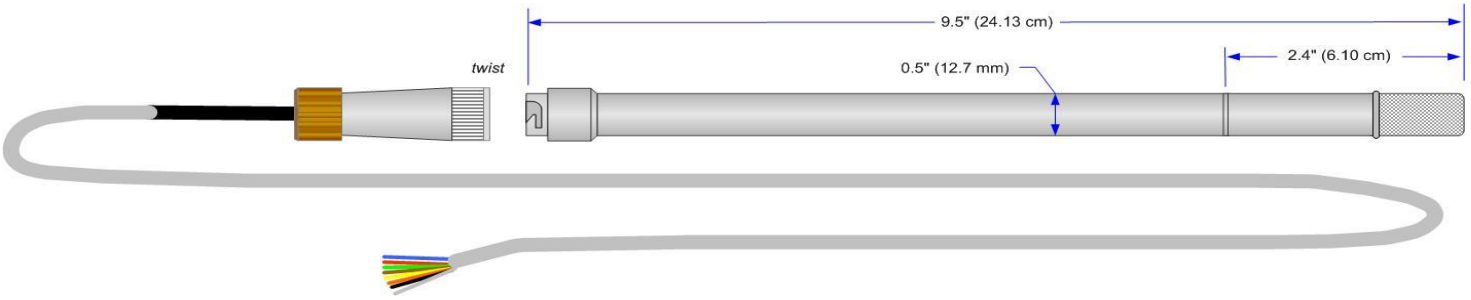
Before mounting the probe into any system ensure the system is safe to work on. Depressurized and verify that all power to connections are isolated in the Off position. Installation should be carried out by trained technicians and following local safety protocols

1. Select Probe insertion position, insure safe clearance around the probe to avoid damage
2. Check all pipe fittings and pipe boss dry assembly for fit up
   (Probe is standard with ½" NPT fitting option ¾"NPT)
3. Insert pipe fittings using suitable sealing tape or sealing compound
   Mount the Probe in position to measure the desired gas.
4. Ensure the Probe is inserted to an adequate depth to obtain a good flow of the sample gas around the tip sensor. Insertion depth; Max 6" (15cm) Min 2.4" (6cm) compression fitting must avoid the connection to the tip cover
5. Tighten the swage fitting till it grips the probe in place but at this stage do not apply force.
6. Re check the probe position and measurement depth are correct, fully tighten all pipe fittings.
7. To correctly tighten a Swagelok fitting,
8. Ensure there is adequate cable length from the probe cable to make connection to customer system (3ft or 6ft length are supplied) cable can be cut to fit.
9. Check Probe Pin connector correctly mates with cable connector

Connect Probe wiring as shown below:

ITEM	CABLE colour
24VdcPower Supply – Pos.	RED
24VdcPower Supply – Neg.	BLACK
0-10V **Temperature**.	YELLOW
0-10V **RH**	WHITE
0-10V **Dew Point**	BLUE
0-10V **psig or mbar**	ORANGE
RS232 Serial Input – TX	GREEN
RS232 -Com	BROWN

DC power supply. Specifications are: 24VDC ± 10%, 1A maximum.



Notes:

Connect only the Outputs desired. See drawing in the HT125 Manual for further connection details.

Do not apply DC Power until all wiring is completed and checked.

Edgetech Instruments

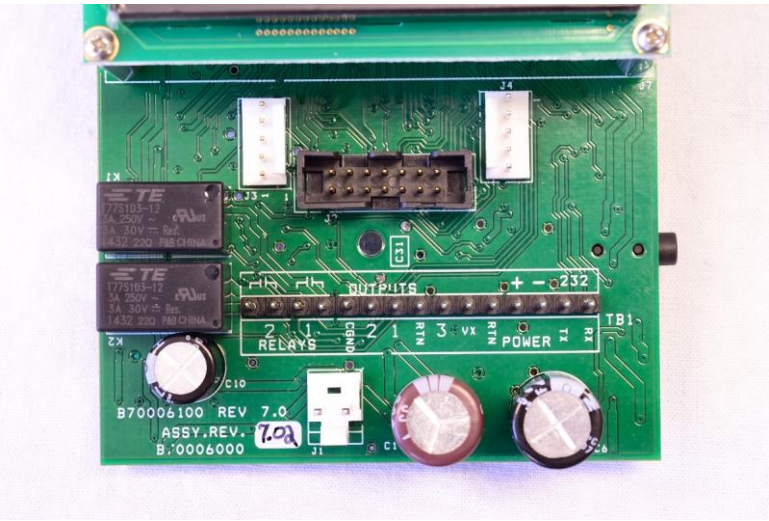
QUICK STARTUP GUIDE

WHEN USING PROBE with INTERFACE CONTROL & DISPLAY MODULE

1. **Mount the Probe as detailed in page 1 section 1 through 6.**

2. **Connect cable from Probe to Electronics Unit (if applicable). Unit is prewired to the DCM if ordered as an option from factory**

3. **Customers connections can be made as detailed in table below**
   Other values can be defined with order or
   Alarm relays can be programed on site via RS232



TERMINAL TB1	ITEM
1,2	ALARM Relay 2
3,4	ALARM Relay 1
5	CHASSIS GROUND
6	ANALOG OUTPUT 2
7	ANALOG OUTPUT 1
8	ANALOG OUTPUT RET.
9	*FOR FACTORY USE*
10	*FOR FACTORY USE*
11	RS232 RETURN
12	DC POWER IN (+)
13	DC POWER IN (-)
14	RS232 TX
15	RS232 RX

DC power supply. Specifications are: 24VDC ± 10%, 1A maximum.

See Attached TB1 Pin Connector Guide. Note Pin Nine is used as terminal location guide
Connect only the Outputs desired. See the HT125 Manual for details.
Double check that the 24V power supply is correctly connected terminals 12 & 13
Do not apply DC Power until all wiring is completed.

TABLE OF CONTENTS Page

1.0 Quick Startup 2

List of Illustrations 5

List of Tables 5

2.0 Edgetech Commitment to Quality 7

3.0 Introduction 8
- 3.1 General Description 8
- 3.2 Specifications Summary 9
- 3.3 Model Descriptions 9
- 3.4 Available Options 10

4.0 Installation 12
- 4.1 Mounting the Probe 12
- 4.2 Probe Electrical Wiring 14
- 4.3 Probe with CAM option 15
- 4.4 Mounting DCM case 16
  - 4.4.1 Wiring Probe to DCM 16
  - 4.4.2 Wiring Inputs / Outputs 17
- 4.5 Selection of Analog output ranges 18

5.0 Basic Block Diagram 19
- 5.1 Probe Assembly 19
- 5.2 Electronics Module 20
- 5.3 Complete System 20

6.0 Operation 21
- 6.1 Initial Bench Testing 21
- 6.2 Normal Operation 21
- 6.3 Factory Default Conditions 21
- 6.4 RS-232 Serial Port 22
- 6.5 Serial Port Setup 22
- 6.6 Set up with PC & USB only 23
- 6.7 Changing DCM program 24
  - 6.7.1 Programming the Alarm Relays 25
  - 6.7.2 Calibrating the Analog Outputs 26

7.0 Maintenance 27
- 7.1 Sensor Circuit Board 27
  - 7.1.1 Removing the Sensor Board 27
  - 7.1.2 Sensor Reassembly 28

8.0 Specifications 29

9.0 Appendix 31
9.1 Warranty Information 32
9.2 Mounting Dimensions 33
9.2.1 Wall Mount 33
9.2.2 Duct Mount 34

LIST OF ILLUSTRATIONS Page

3-1 Some HP125 Configurations 9

3-3 Unit alarm versions 10

4-1 HP125 with Swagelok fitting 13

4-3 CAM installation details 15

4-4 Electronics Unit Wiring 16

4-5 DCM terminal strip connections 17

4-6 DCM Analog DIP switches 18

5-1 Probe Block Diagram 19

5-2 System Block Diagram 21

7-1 Sensor Exploded View 28

LIST OF TABLES Page

3-1 Standard Configurations 10

3-2 Measurement Ranges 12

4-1 Probe Wiring 14

4-2 HP125 Wiring Colors 14

4-3 DCM Serial Port Wiring 16

4-4 DCM Analog Output Wiring 18

4-5 DCM Analog output Dip Switch 18

6-1 Serial cable wiring 23

2.0 EDGETECH'S INSTRUMENTS COMMITMENT TO QUALITY

Thank you for purchasing one of our products. At Edgetech Instruments, it is our policy to provide cost-effective products and support services that meet or exceed your requirements, to deliver them on time, and to continuously look for ways to improve both.
We all take great pride in the products which we manufacture 100% in the USA.

We want you to be entirely satisfied with your instrument. The information contained in this manual will get you started. It tells you what you need to get your equipment up and running and introduces its many features.

We always enjoy hearing from the people who use our products. Your experience with our products is an invaluable source of information that we can use to continuously improve what we manufacture. We encourage you to contact or visit us to discuss any issues whatsoever that relate to our products or your application.

The Employees of Edgetech Instruments Inc.

3.0 INTRODUCTION

3.1 GENERAL DESCRIPTION

The Edgetech Instruments HP125 Series is a family of multi-function probes that offers a variety of measurement parameters with high accuracy. A single sensor can provide up to 4 measurement parameters. Dew point, Relative Humidity (%RH), Temperature and Pressure (psia or mbar). Electrical analog and digital outputs are provided

The HP 125 probes are designed for ease of installation and operation. Field-replaceable sensor modules have standardized outputs for interchangeability. Replacement tip sensors come with calibration certification and automatically integrate with the main sensor. The power requirement is a common unregulated DC power supply. User-available electrical outputs include linear analog voltage (or optional current).
Mounting options include Wall Mount, Remote Mount, and Duct Mount configurations. A remote or local Display Unit (Type DIS) is available, with a two-line LCD display, two alarm relays, and two analog outputs.
The analog outputs can be configured by dip switch for either 4-20mA, 0- 10V and 0-5V operation.

Figure 3-1 Some of the Available HP125 Configurations

a. Stand-alone Probe

b. Remote Mount with Display Option

c. Wall Mount

3.2 SPECIFICATIONS SUMMARY

(See Specifications, Chapter 8, for additional information)

3.2.1 STAND-ALONE PROBE

Analog Outputs: Up to four 0 – 10 Vdc

Digital Output: RS-232 serial output. Reporting function every 10s, space delimited

Power Supply: 24 Vdc ±10%, unregulated, 1A max.

Accuracy
Relative Humidity ±1.8% @ 23°C (0 TO 90% RH)
Temperature ±0.5°C
Pressure ±1 mbar @ 25°C (600 to 1200 mbar) / ±5mbar (-40°C to +125°C)
Dew Point ± 1°C for –10°C to 95°C DP and + 2°C for –40°C to –10°C

Mounting: Cable Length 3 feet (1M) std or 6ft (2M) option
Fitting: 1/2 inch NPT stainless steel

Dimensions: Length: 9.5 inches
Diameter:1/2 inch

Materials: Housing: 316 Stainless Steel
Filter: Sintered SS 100µm (removable)

3.2.2 PROBE WITH ELECTRONICS UNIT

Analog Outputs: Dip switch selectable 4 – 20mA, 0 – 10V and 0 – 5V. x2

Digital Output: RS-232C, bi-directional

Alarm Relays: Form A (SPST, NO) x2

Power Supply: 24Vdc ±10% unregulated, 1A max.

RH Accuracy: ±1.8% @ 23°C (0 TO 90% RH

Temp. Accuracy: ±0.5°C

Electronics Housing Protection:
IP66 (NEMA 4X) Dust tight and moisture resistant

Table 3-1 HP125 Series, Standard Available Configurations

MODEL NO.	SENSOR ONLY	SENSOR PLUS ELECTRONICS MODULE – WITH DISPLAY
HP125	**X**	**X**
HPP125	**X**	**X**
HPB125	**X**	**X**

3.3 HP125 MODEL DESCRIPTIONS

HP125 – RH / Temperature / Calculated Dew Point.

HPP125- Pressure / RH / Temperature / Calculated Dew Point.

HPB125 - Barometric Pressure / RH / Temperature / Calculated Dew Point

3.4 AVAILABLE OPTIONS

Probe

-2M- Optional Sensor connection cable length 6ft (2M).

-3/4NPT– An optional pipe fitting to adapt the ½ in probe to fit replace old HT probe series.

Display and electronic control module

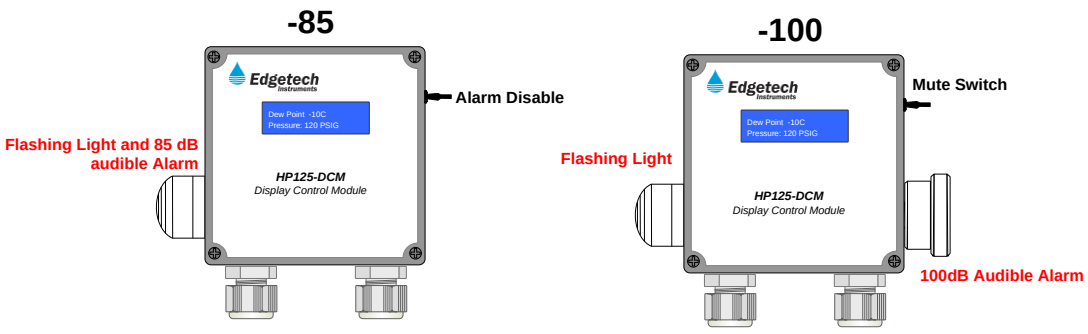
-DIS- Remote electronics module with two-line LCD digital display, two configurable analog outputs, Bi directional RS-232C, and two programmable alarm relays.

-VAC- Universal Power supply input 110/220V 50/60Hz output 24Vdc.

-F- Two FORM C fail safe relays. Power Off = Alarm Mode (enclosure length increases by 2").

-85- Integrated dual 85dbA audible and simulated visible strobe LED Alarm with disable switch.

-100- Individual 100dbA audible alarm with mute switch and separate simulated visible strobe LED.



Sampling Options

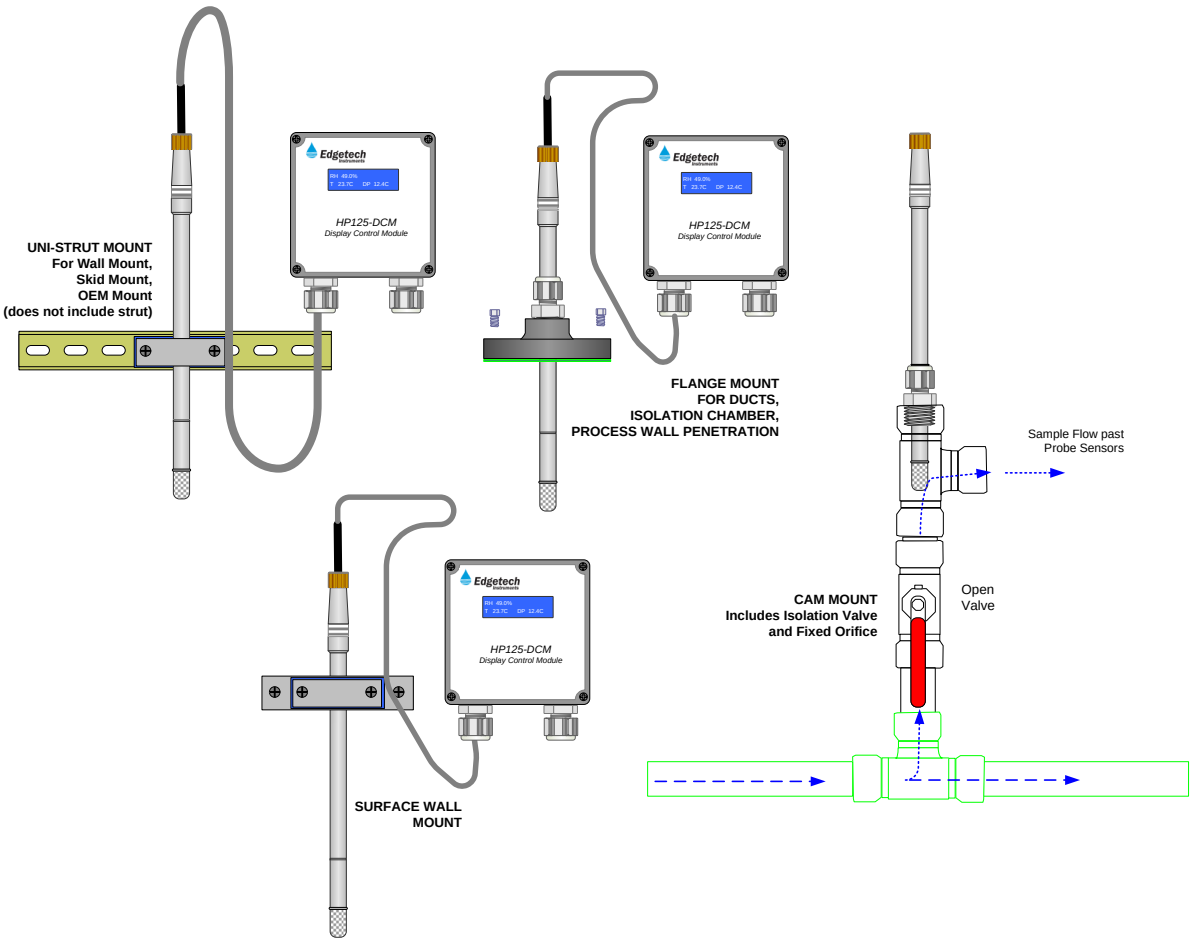
-SM- Surface Wall mount, the sensor is mounted between two polypropylene blocks with integral surface wall mount.

-UN- Same as wall mount only the sensor holding blocks can be fitted into a Uni-strut fitting

-FSS- 300psi Stainless Steel pipe flange mount with gasket, with integral threaded sensor boss.

-FPVC- 150psi PVC pipe flange mount with gasket, with integral threaded sensor boss

-CAM- Compressed air sample module allows a measured sample of gas to pass across the probe and bleed to atmosphere. Includes Isolation valve for service access and metered sample flow.



-HP125 Tip – Field-replaceable sensor module for RH/Temperature/Dew Point. Interchangeability accurate to published specification.

-HPP125 Tip – Field-replaceable sensor module for RH/Temperature/Pressure. Interchangeability accurate to published specification.

-HPB125 Tip – Field-replaceable sensor module for RH/Temperature/Barometric Pressure. Interchangeability accurate to published specification.

Table 3-2 HP125 Series Sensor Measurement Ranges

MODEL NO.	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
HP125	DEW POINT	AIR TEMP.	PERCENT RH	
DEFAULT RANGE	-40 to +95ºC	-40 to +125ºC	0 TO 99.9%	
MAX. LIMITS	-40 to +95ºC	-40 to +125ºC	0 TO 99.9%	
HPP125	DEW POINT	AIR TEMP.	PERCENT RH	PRESSURE
DEFAULT RANGE	-40 to +95ºC	-40 to +125ºC	0 TO 99.9%	0 to 400psia
MAX. LIMITS	-40 to +95ºC	-40 to +125ºC	0 TO 99.9%	0 to 400psia
HPB125	DEW POINT	AIR TEMP.	PERCENT RH	BAR. PRESSURE
DEFAULT RANGE	-40C TO +95°C	-20 to +125ºC	0 to 99.9%	600 to 1200 mbar
MAX. LIMITS	-40C TO +95°C	-20 to + 125ºC	0 to 99.9%	600 to 1200 mbar

4.0 INSTALLATION

4.1 MOUNTING THE PROBE

The HP125 Probe includes a stainless steel Swagelok mounting sleeve commonly used in pipe connections. It is supplied with a tapered male 1/2-inch NPT pipe thread or optional ¾-inch NPT male fitting. The Swagelok fitting should be removed from the probe and carefully split into its two component parts. The male NPT part should be mounted in a gas-tight manner to the pipe or to a flat surface of a duct or chamber wall containing the gas to be measured.

To install the mount and Probe:

1. Separate the two parts of the Swagelok mounting sleeve.

2. Screw the front portion of the mounting sleeve (the tapered NPT fitting) into a pre-mounted threaded mating fitting. Teflon™ tape may be used for a good seal. Do not over-tighten. The ¾-NPT adaptor will allow the new HP125 range to be fitted in place of the previous HT/HB sensors from Edgetech.

3. The ½-inch female part of the pipe mount along with the SS flare feral is mounted on the probe body. Ensure that the flare feral is installed with the flat side on the top and the tapered side facing down towards the sensor end of the probe

4. Insert the Probe into the rear portion, and screw this part of the mount into the previously mounted front portion, so that the Probe is gripped snugly. Do not over-tighten at this stage. As much of the Probe as possible should protrude inside the area to be measured, to avoid possible laminar flow errors. Designed to allow the user to set the depth of penetration from 2.4” (6cm) to 6” inch (15cm) depending on application needs.

5. Once the probe is correctly positioned install the connection cable to check length and ease of access to the cable connections at both ends. Remove the connection cable to avoid twisting. Now firstly tighten the pipe bases section and then with the probe in the selected insertion depth tighten the Swagelok fitting. **Caution *do not over tighten***.

6. How to install Swagelok fittings. Insert the HP125 probe to your selected insertion depth, tighten by hand until the nut is finger tight. Further tighten the nut until the probe will not turn by hand and cannot be moved axially in the fitting.
   Mark the nut at the at the 6-0-clock position
   While holding the fitting body steady, tighten the nut one and one quarter turns till the nut is in the 9-0-clock position.
   Swagelok fittings may be disassembled and reassembled many times.

   ⚠**Always depressurize the system before disassembling a Swagelok tube fitting**
   Prior to disassembly mark the nut positions this will ensure you return the fitting to the same positions. At this point tighten the nut up slightly.

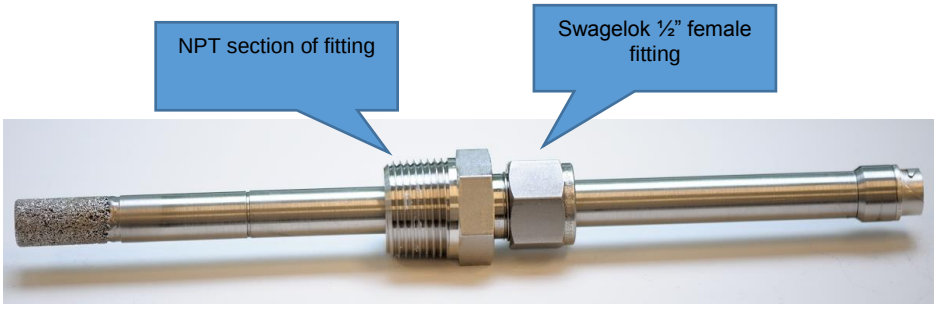


Fig 4.1 Shows HP125 with ¾" NPT to ½" Swagelok fitting

4.2 **Wiring probe only** See Wiring Table 4-1and Figure 4-2 below.

ITEM	CABLE colour
24VdcPower Supply – Pos.	RED
24VdcPower Supply – Neg.	BLACK
0-10V **Temperature**.	YELLOW
0-10V **RH**	WHITE
0-10V **Dew Point**	BLUE
0-10V **psig or mbar**	ORANGE
RS232 Serial Input – TX	GREEN
RS232 -Com	BROWN

DC power supply. Specifications are: 24VDC ± 10%, 1A maximum.

Table 4-1 HP125 Probe Wiring Table

1. Connect Power Supply wiring as shown. The Positive voltage output of the supply is connected to the RED wire. The Negative output of the supply is connected to the BLACK wire.
2. Connect the Analog Output wiring as shown. Up to four 0 to 10 Vdc outputs are available. Connect Outputs 1, 2, 3 and 4 as required, observing the color codes.
3. Connect the RS-232 Serial Output if desired. Only 2 wires are required if the output is needed for transmitting information only

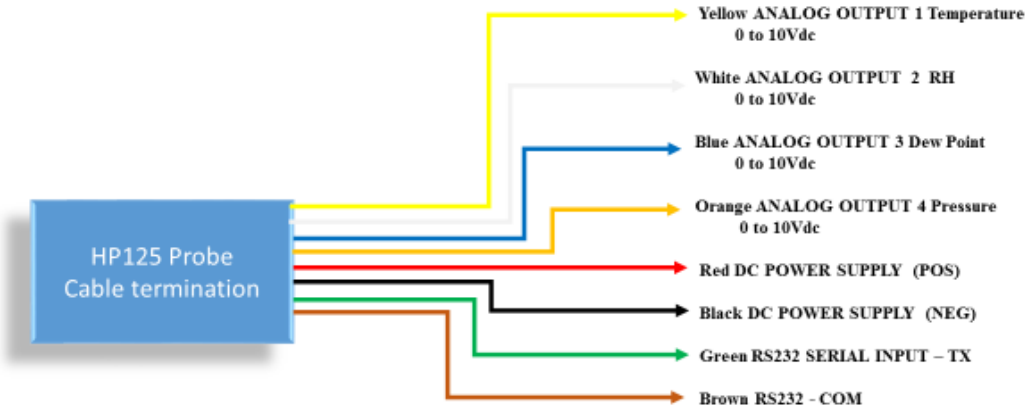
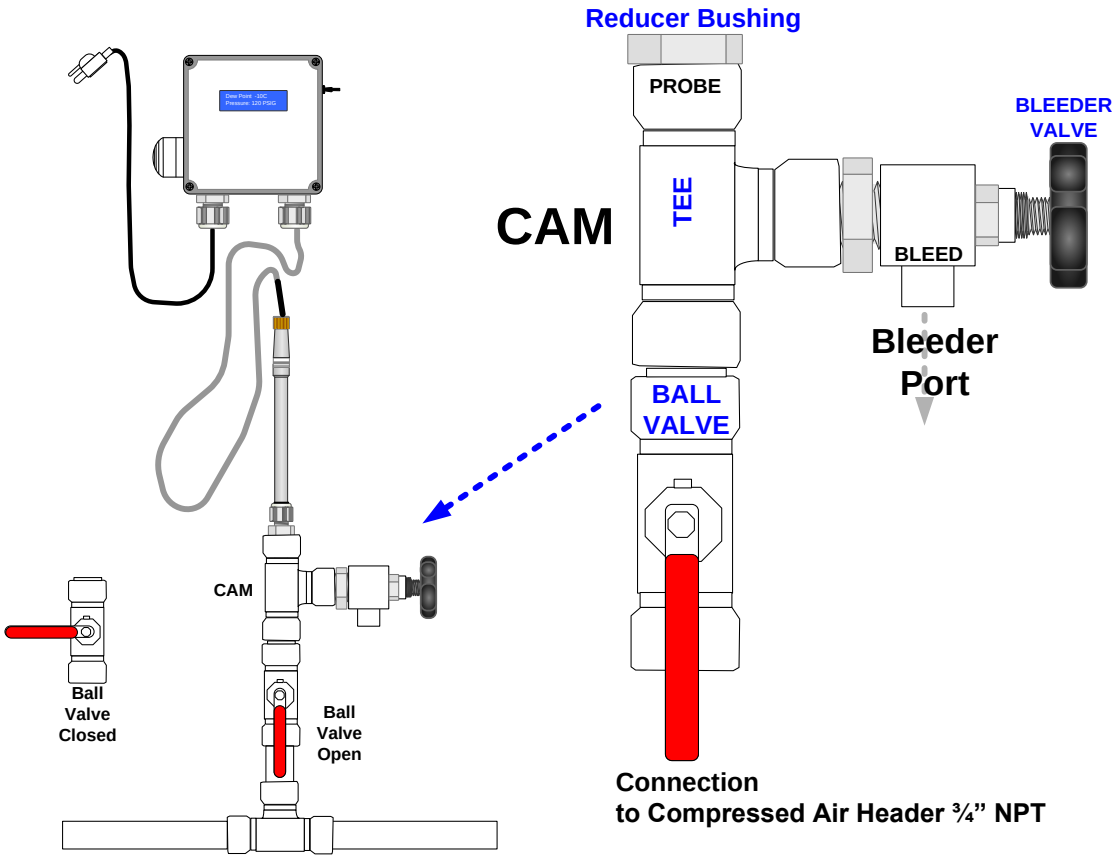


Table 4-2 HP125 Probe Wiring Table

4.3 Installation HP125 Probe with CAM option



1. Close ball valve on the CAM. Close the Bleeder valve (clockwise).
2. Install the HP125 Probe onto the CAM top port. The CAM is supplied with a Reducer Bushing to accommodate the installation of the Probe when equipped with a ½ inch NPT male threaded compression fitting. If the HP125 is equipped with a ¾ inch NPT fitting, then remove the reducing bushing and thread the probe directly into the TEE fitting. Be certain to apply thread tape to male threads of the probe compression fitting before installation to ensure a seal.
3. The probe slides through the compression fitting. Adjust height of the probe with the CAM TEE so that the probe sensing tip is approximately in the center of the TEE (gas will flow past the tip and then out of the bleeder valve).
4. Ensure the Compressed Gas Source pressure is OFF (de-pressurized). Connect the CAM at the bottom port of the ball valve. Ensure all fittings are tightened. **CAUTION the CAM is designed to operate with compressed gas. Always take the proper safety precautions when working with pressurized gases!**
5. Re-pressurize Compressed Air System. Slowly open the Ball Valve to pressurize the CAM and probe. Check for leaks.
6. Slowly adjust the CAM bleeder valve to allow a small flow of gas out. This flow should be very small- just noticeable. You can check flow with a flowmeter. Ideal flow is approximately 1-3 LPM.

4.4 MOUNTING THE DCM MODULE

Instruments with the plastic wall mount housing are mounted to a flat surface as follows:
For dimensional details of case see Appendix 9.2 page 34

1. Remove the front cover. Using a flat screwdriver, carefully unscrew the four slotted plastic screws.

2. Mounting screws (not provided) are inserted in the same holes as the cover screws. They must have a head diameter that is small enough to fit inside the clearance holes, but large enough to press against the collar located at the bottom of the holes. No. 8 pan head or round head screws are recommended.

3. Reinstall the front cover. Do not over-tighten the cover mounting screws.

MOUNTING CONSIDERATIONS

1. If the Digital Display has been provided, is it easily visible?
2. Is the location convenient for routing electrical wiring?
3. Is the module within 6 feet (1.8 meters) of the Sensor location

4.4.1 PROBE WITH **DCM Option ELECTRONICS MODULE**

See Tables 4-2, 4-3, and Figure 4-1, 4.2 below.

If the HP125 is ordered with the display DCM option then it will come with the HP125 sensor and power cable already completely prewire.

If installing the Display module when ordered as separate option

Carefully tap out the desired knockouts, and mount the cable glands.
We recommend that you route the Probe Cable through a bushing on the left. Route all other wiring through the bushing on the right.

Run the cable from the Probe to the display unit. Only the probe RS232 and power cables are used to connect the probe to the display module. As Table 4.2. A right angle jack plug is used for the RS232 connection to PCB see Fig 4.2

ITEM	CABLE colour
24VdcPower Supply – Pos.	RED
24VdcPower Supply – Neg.	BLACK
RS232 Serial Input – TX	GREEN
RS232 – Com	BROWN

Table 4.3

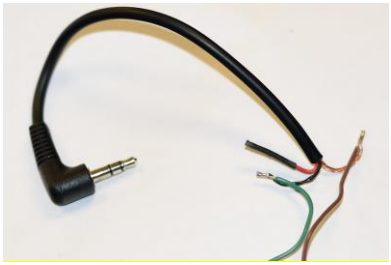


Fig 4.2

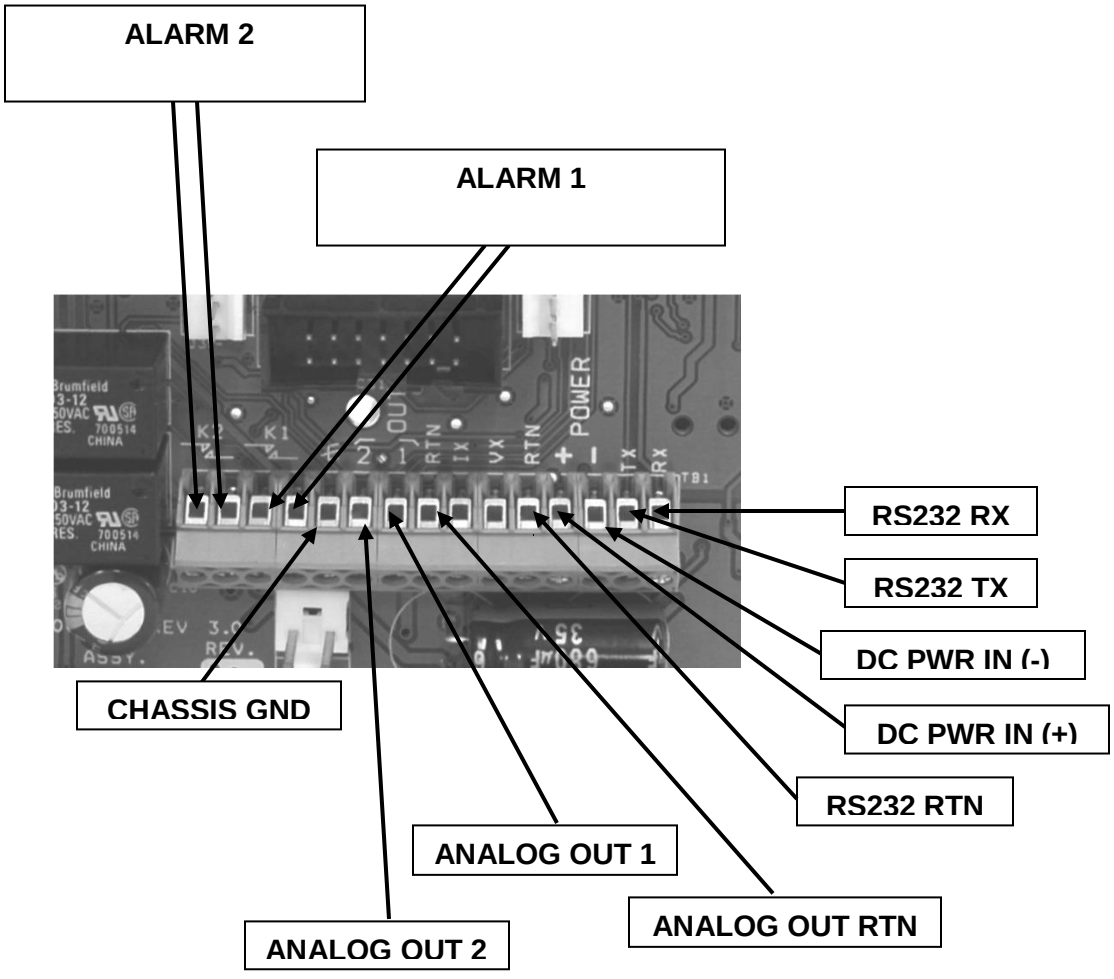
4.4.2 INPUT/OUTPUT WIRING

Wire the Analog Outputs as required. See 4.4 below for information on output selection.

Connect the RS-232 Serial Output if desired. Only 2 wires are required if the output is needed for transmitting information only. A third wire is added for bi-directional communications with the serial port

1. Wire the External customer connections as shown in Table 4-3.
2. Wire the two 4 to 20 mA Analog Outputs and Alarm Relays as shown in Table 4-2 if desired.
3. Connect to the RS-232C Serial Port at J6 if desired.

Figure 4-5 DCMTerminal Strip Wiring



TERMINAL	ITEM
1,2	ALARM 2
3,4	ALARM 1
5	CHASSIS GROUND
6	ANALOG OUTPUT 2
7	ANALOG OUTPUT 1
8	ANALOG OUTPUT RET.
9	*FOR FACTORY USE*
10	*FOR FACTORY USE*
11	RS232 RETURN
12	DC POWER IN (+)
13	DC POWER IN (-)
14	RS232 TX
15	RS232 RX

Table 4.4

Connect the Alarm relays as needed. Used as upper or lower setpoint Alarm Relays. See Section 5.4.4 for further information.

4.5 SELECTION OF ANALOG OUTPUTS

Two small electrical switches allow the selection of analog output scaling. These switches are located in the top left corner of the circuit board as shown in Figure 4-2 below. You can select the outputs to be either 4 to 20 mA, o to 5VDC, or 0 to 10VDC. To modify the output scaling, proceed as follows:

1. Be sure that DC Power is <u>not</u> applied to the unit.
2. Remove the outer cover.
3. Using a small screwdriver, set the switches as shown in Table 4-2.
4. Replace the cover.
5. Reapply DC power.

OUTPUTS	SWITCH 1	SWITCH 2
4 to 20 mA	DOWN	----
0 to 5VDC	UP	UP
0 to 10VDC	UP	DOWN

Table 4-5. Analog Output Switch Settings

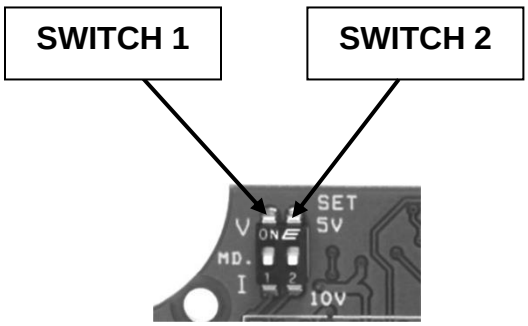


Figure 4-2 Output Selector Switches

BASIC BLOCK DIAGRAM THEORY OF OPERATION

5.1 PROBE ASSEMBLY

See Figure 5-1, the Probe Assy. Basic Block Diagram.

The Probe Assembly is a stand-alone, completely self-contained measuring system. All units include the RH and Temperature Sensors, and some optional probes include a Pressure Sensor as well. The field-replaceable tip Sensor Circuit Board has standardized output levels for all four measured parameters. Therefore, boards may be quickly replaced while in operation without the need for recalibration, maintaining full system accuracy. The Microprocessor performs the system control, parameter calculation, and serial digital communications. Digital-to-Analog (D-A) conversion provides four 0 to 10 Vdc linear Analog Outputs corresponding to the measured and/or calculated parameters.

The serial digital RS-232 interface is allowing to user to only receive and record measured information,

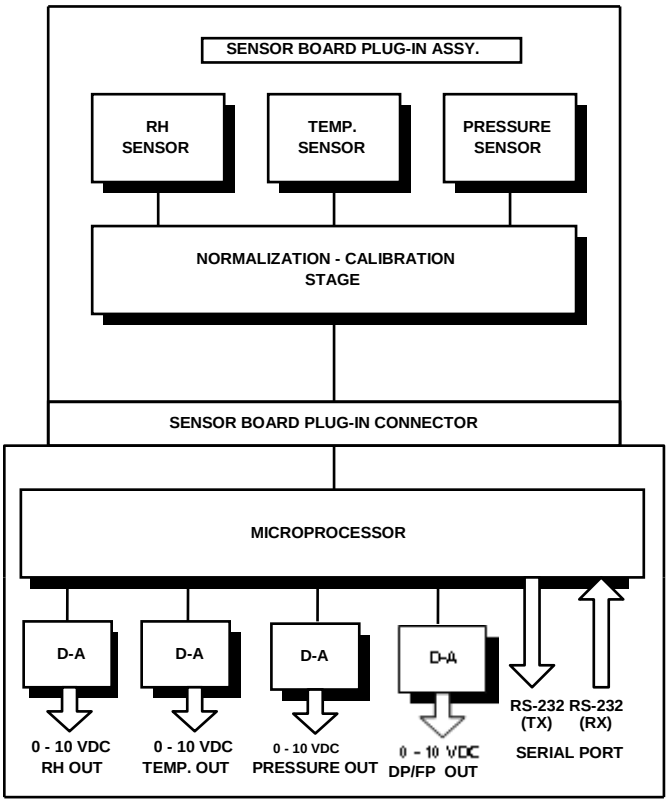


Figure 5-1 Basic Block Diagram, Probe Assy

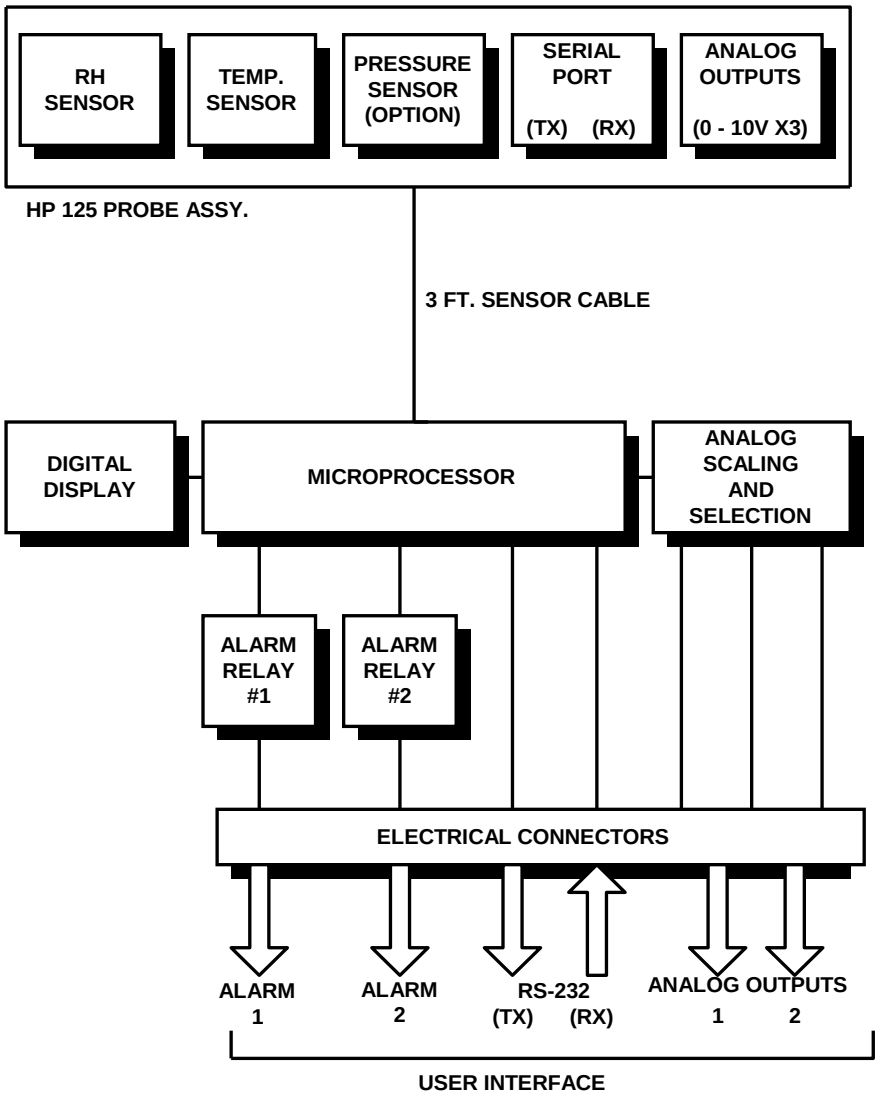
5.2 HP125 ELECTRONICS MODULE (Type DCM)

Although the Probe may be used as a stand-alone measuring device, it also may be connected to the type DCM remote display unit, for additional capability. The complete HP125 system consists of the Probe, the interconnecting 3 foot (1meter) cable, and the electronics module. Outputs of the unit include a Serial Port, two Alarm Relays and two configurable analog outputs. A two-line LCD Digital Display is also included that can display all the operating parameters.

5.3 THE COMPLETE HP125 SYSTEM

Figure 5-2 is a basic block diagram of the complete Humidity, Temperature, DewPoint and optional Pressure measuring system. The remote Probe is connected, via the attached cable, to the electronics module. The system is completely controlled by the microprocessor in this module. Upto four sets of analog voltage outputs from the Probe are routed through the Analog Scaling and Selection stage. The scaling of these output signals may be programmed by the user to any desired range by using the RS-232 Serial Port. The bi-directional RS-232 is brought out to a connector in the electronics module. The user can also program the two Alarm Relay set points via this digital interface. The built-in LCD Digital Display, which provides information on all measured parameters, is also controlled by the microprocessor. In addition, the microprocessor is used to calculate other parameters than those directly measured by the sensors in the Probe. These may be shown on the Digital Display, and they are also available on both the analog and digital (RS-232) outputs. The Alarm Relays may also be set for these calculated values.

Figure 5-2 System Basic Block Diagram



6.0 OPERATION

6.1 INITIAL BENCH TESTING

New units may be tested on the bench before installation, if desired.

For units consisting of the Probe only –

1. Connect a proper Power Supply to the correct wires.
   Caution: Observe polarity!

2. Using a DC Voltmeter, measure the 0 to 10Vdc Output and confirm that it corresponds to the room condition. (Humidity, Temperature, etc.)

For systems consisting of the Probe and the Electronics Unit –

1. Connect the Probe to the Electronics Module.

2. Connect a proper Power Supply to the correct terminals.
   Caution: Observe polarity!

3. Measure the 4 to 20 mA Output as above, or read the Digital Display.
   Confirm that the reading corresponds to the room condition.
   (Humidity, Temperature, etc.)

6.2 NORMAL OPERATION

Note:

This section assumes that all required electrical wiring and mounting has been completed. See the Installation section for further information if necessary.

Use of the HP125 series of probes is extremely simple. There are no controls to operate during normal use, as these devices are designed for long-term unattended operation. With the Analog Outputs, Digital Outputs, and/or Alarm Relays connected to a Data Acquisition System, Recorder, Process Controller, Computer, or Terminal, the user has only to periodically monitor the system for normal operation.

6.3 FACTORY DEFAULT RANGES

See Table 3-2 for information on the measurement ranges provided by the Factory. The maximum range limits are also shown in Table 3-2.

The scaling of the default measurement ranges may be changed in the field via the Serial Port if required. See Section 6.4 below for range-changing instructions.

6.4 USING THE RS-232C SERIAL PORT TO REPROGRAM YOUR SETTINGS

Note: If the Factory Default settings are satisfactory, there is no reason to perform any programming.

The Sentry series air header system alarm is very versatile. Through the Serial Port, the user may view current settings, change factory set parameters, or receive an automatic update of system measurements and alarm status. Factory Set parameters include:

- Serial number of the Smart Sensor Tip
- Version Software
- Pressure set points: alarm engaged, disengaged
- Dew Point set points: alarm engaged, disengaged
- Units for Dew Point: degrees F or C
- 4-20mA output Pressure: Range Setting
- 4-20mA output Dew Point: Range Setting

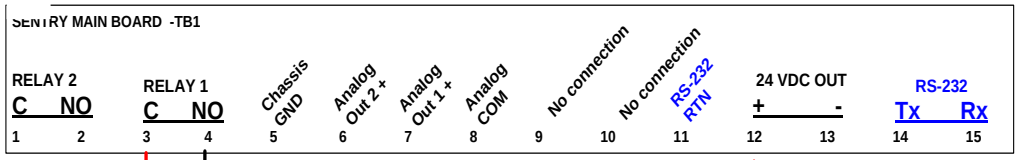
6.5 SERIAL PORT SETUP

You will need a serial cable with a female DB-9 connector on one end, which will mate to the serial port connector on your PC. ETI offers an RS-232 cable in our accessories. If you do not have a serial port on your PC, jump to the next page " **PC with USB port only**". The open end of your RS-232 Serial cable will need the three associated wires for Transmit / Receive / Return identified and exposed. These wires are to be connected to Terminal Strip TB1 on the ASHA circuit board as shown below:

Table 6-1 Serial Cable Wiring

Female **DB-9 SERIAL CONNECTOR**	**TB1 TERMINAL STRIP**
Pin 2	TX – Term. 14
Pin 3	RX – Term 15
Pin 5	RTN – Term. 11

Sentry terminal block:



6.6 PC with USB Port only:

If your PC does not have an available serial port, you can use the ETI accessory: **RSCBL (**RS232 cable) plus the USB (**USB to SERIAL Converter)**. The ETI kit provides the 3 stripped RS232 wires, labeled and the wire ends properly tinned- to be connected to the ASHA plus a USB converter jack to plug into your PC USB port.

Using a terminal emulation program, such as HyperTerminal or TERA TERM, set your PC Com Port to:

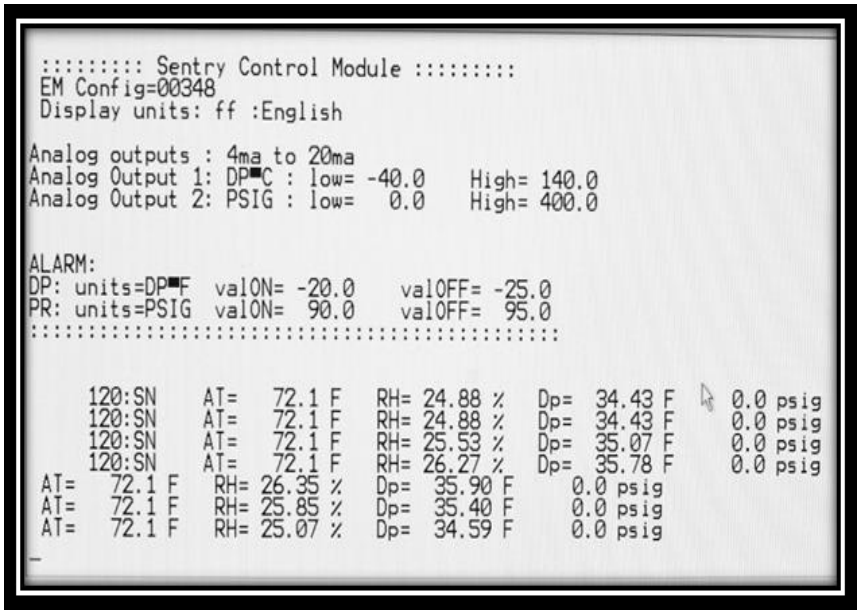
BAUD:	19200
BITS	8
STOP BITS	1
PARITY	NONE
FLOW CONTROL	NONE

After connecting the serial cable, apply power to the ASHA. A window appears showing warm-up and self-test data. Also included is Identification information including probe serial number and version of software. If the sensor probe or the smart sensor tip is not installed, a warning message will display. In this case, power down the unit, install the tip/ probe, and re-power the ASHA.

After the self-checking and start-up period, the window will display information similar to the photo shown on next page. This is the default condition. It indicates the current settings:

- Degrees F for Dew Point
- Imperial Display
- 4-20mA output for Dew Point
- 4-20mA output for Pressure
- DewPoint Alarm Settings: F or C,
  set point on dewpoint rise and setpoint on dew point restore
- Pressure Alarm Settings: PSIG, setpoint on pressure loss and setpoint on dew restore

And then it begins to display the Sensor Serial Number followed by current measured values in a text string, tab delimited.



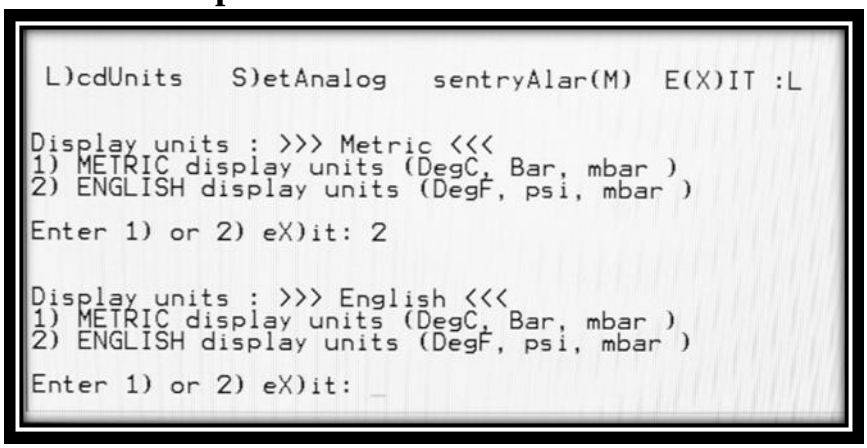
6.7 PROGRAMMING THE DCM

If you do not see a window similar to the one shown above, you will not be able to program this instrument.
Check your terminal emulation program, the power supply, and check the interconnecting cable wiring as shown in Table 5 -1 above.

NOTE: WHEN PROGRAMMING ALPHABETIC CHARACTERS, USE UPPER CASE ONLY.
To begin reprogramming, press the ESCape key on your computer keyboard. The window will change to that shown below. To select the desired parameter, simply select the first letter as shown.
You will find it quite intuitive once you try it. Several programming examples will be shown here.

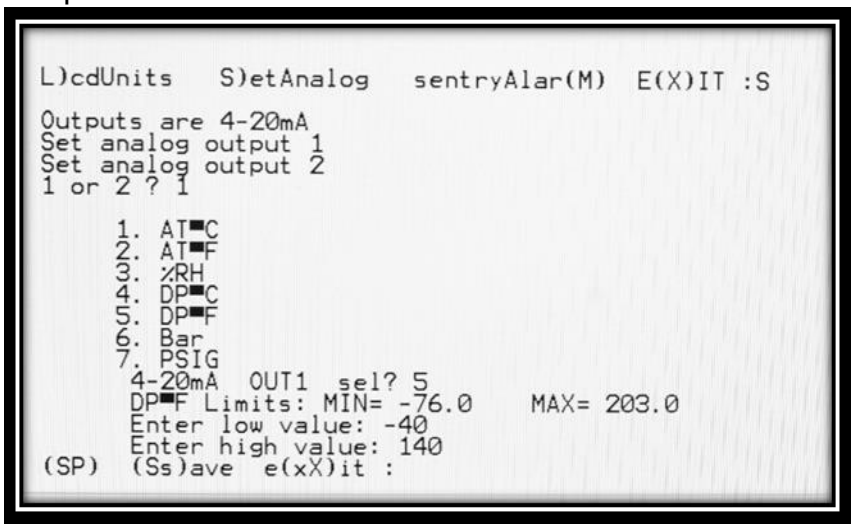
i. CHANGING Between Metric and Imperial values

Units of Measurement: To change the units of measurement from ENGLISH (Imperial) which is standard **(DegF, PSI**) to metric (**DegC, Bar**)- enter "L".
Enter "2" for English (imperial) or "1" for Metric as prompted. The entry will be recognized and then prompt to Enter or "X" to exit.



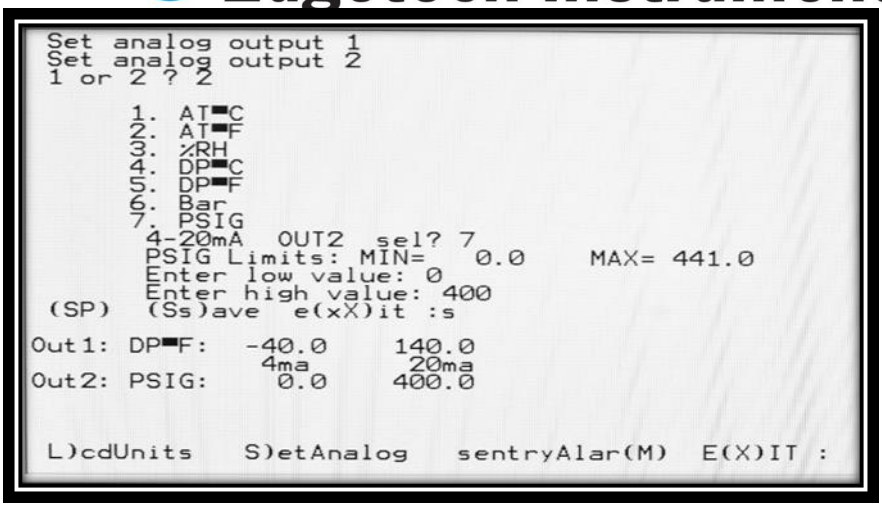
ii. Changing 4-20mA outputs

4-20mA Outputs: There are (2) 4-20mA outputs. These are factory set to represent Pressure and DewPoint. To set the 4-20mA output ranges enter "S". Enter "1" for change output 1. Or enter "2" to change output 2.
To set Output 1, enter "1". You will be prompted to enter which parameter to represent output 1. In the example above, output 1 is set to represent DewPoint in degrees F by entering "5". Next you are prompted to enter the low value. In the example above, "-40" was entered to represent 4 mA. Then you are prompted to enter the high value. In the example above, "140" was entered to represent 20mA.

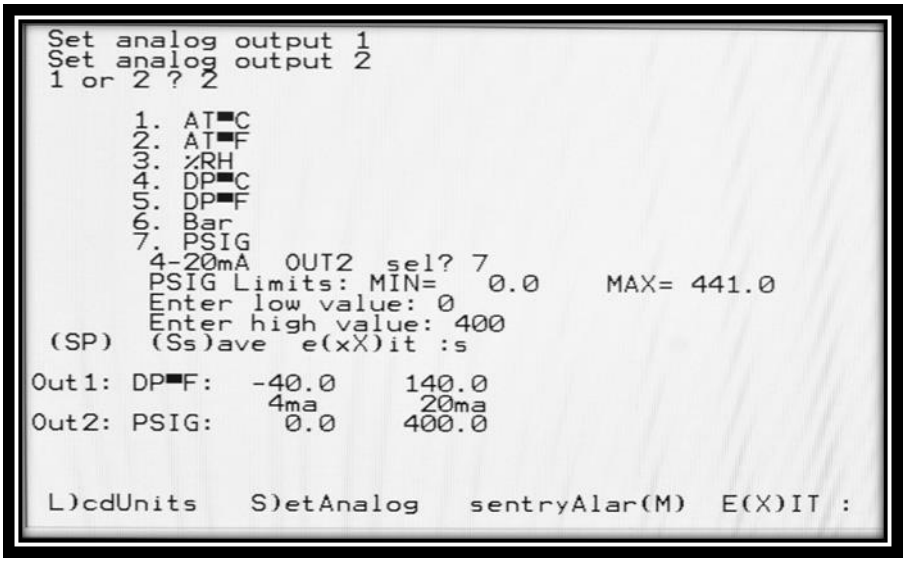


The entry will be recognized and then prompt to enter "S" to save new settings or "X" to exit.

To set Output 2, Enter “2



In the example, Output 2 is set to represent pressure by entering “7” when prompted. Pressure is represented in the ASHA as PSIG units. You will be prompted to enter a psig value for the low setting. In the example, 4 mA is set to “0” psig and 20mA is set to “400” psig.

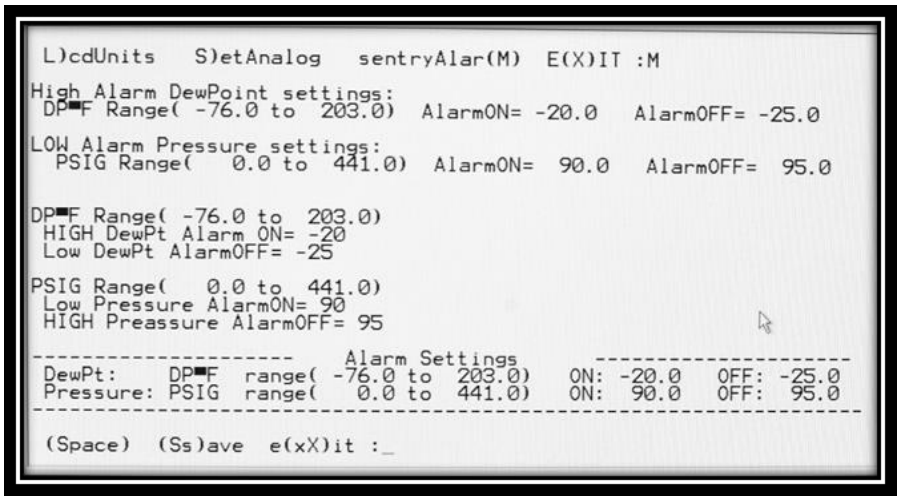


6.7.1 RELAY OUTPUTS

Two relays, R1 and R2, are built into the Sentry
There are (2) **ALARM LOGIC PARAMETERS.** There are (2) Alarm Relays. One relay is reserved for factory use, the second is a duplicate logic, but is available to the customer. The Relay Alarms are factory set to represent Pressure Loss and High DewPoint . The logic that turns the alarm on, is either pressure loss or high dew point. Both relays follow the same logic. For each logic point (pressure and dew point) a ***trip point*** and a ***reset to normal operation point*** is set.
For loss of pressure, the setpoint determines the pressure point when the alarm is activated (Default is 95PSIG). Normal operation of the ASHA is not restored (alarm off) until the return to normal operation point is achieved for both logic points (pressure and dew point). The return to normal point is set to a higher pressure point than the trigger point. The factory default is 5 psig higher than the trigger point (Default100PSIG).

For high dew point, the setpoint determines the dew point when the alarm is activated. Normal operation is not restored (alarm off) until the return to normal operation point is achieved This second dew point is set to a lower dew point than the trigger point. The factory default is 5 degrees below the trigger point. Both conditions must be at return to normal operation before the alarm turns off.

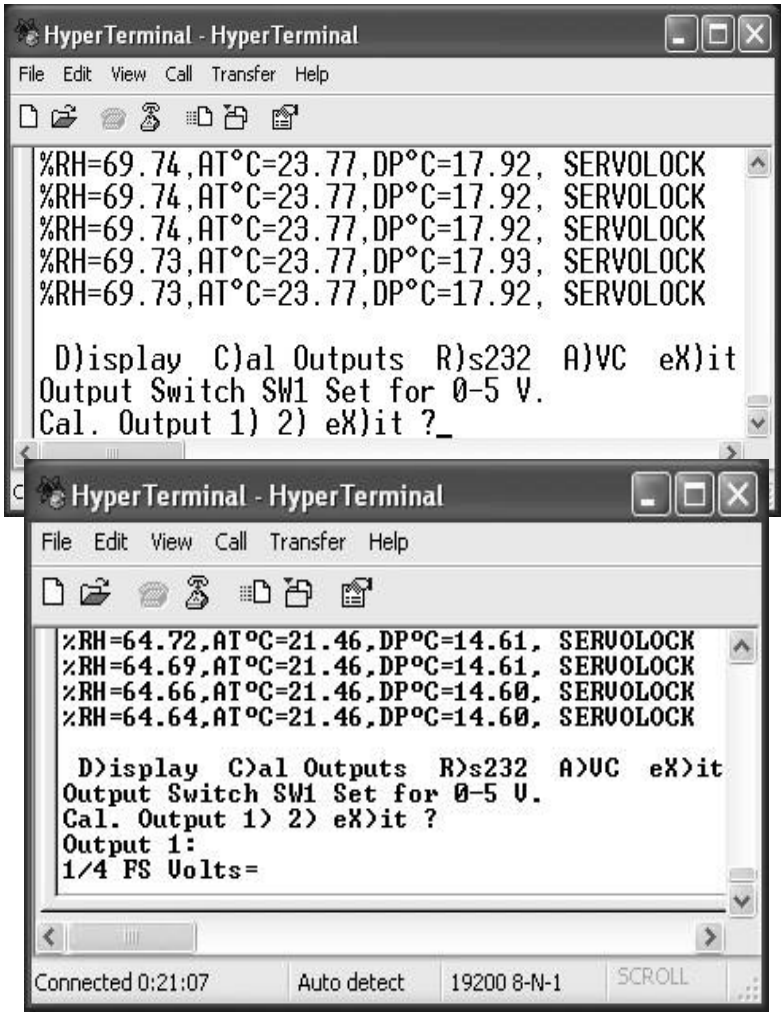
To set the Alarm setpoints enter "M". The current settings will be displayed. Then follow the prompts to enter the setpoints.
After you have made the alarm setting, enter S to save or X
to exit.



6.7.2 CALIBRATING THE ANALOG OUTPUTS

If you have a precise multimeter or voltmeter, you can check the accuracy and scaling of the analog outputs. Connect your meter to terminal strip TB1 on the circuit board. If you have selected 4 to 20 mA current output, you can connect it in series with the load. If you have selected 5 or 10 VDC, connect it between the voltage output and RTN.

Press C for C)al Outputs. This window shows that the output switches on the circuit board are set for analog outputs of 0 to 5VDC, and you can now select Output 1 or 2 to test. Selecting Output 1, a new window will be seen, as shown below. A new output voltage will be measured on the terminal strip, corresponding to ¼ of Full Scale. Type in this voltage reading as requested by the program. Press the Enter key. You will then see a second screen, giving you the value of ¾ of Full Scale. Also, type in this value as requested by the program. Press Enter. Now, the voltage corresponding exactly to midscale will be measured at the output. Your meter should read 2.50VDC +/- 0.02 volts, +/- the meter error. You can save the calibration, and then eX) it from the program



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7.0 MAINTENANCE

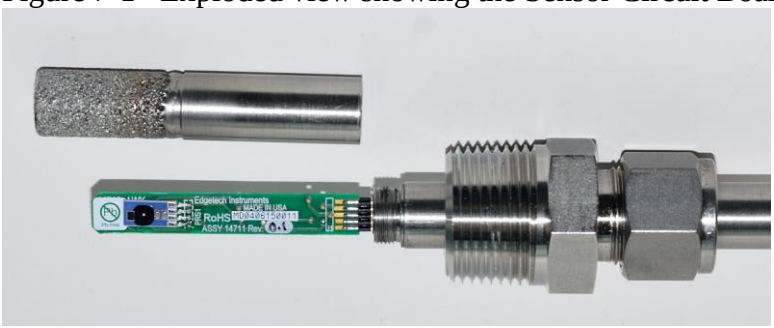
Pressurized gas risk
Hazardous chemical and gas risk
Electrical risk

Ensure adequate safety procedures have been followed
Before starting any work ensure the sensor has been powered down.
Check to ensure that there is no pressure on the probe.
Check to ensure the sensing line or sample area is fully depressurized.
When removing the HP125 sensor slowly release the Swagelok retention fitting.

7.1 SENSOR CIRCUIT BOARD

Inside the barrel of the Sensor probe, mounted directly at the tip, is the plug-in sensor circuit board. This board has been calibrated at the Factory for a standard output level. Since all boards have been calibrated for the same normalized level, they may be replaced in the field without the requirement for recalibration, while maintaining the full published system accuracy specification.

Figure 7-1 Exploded view showing the Sensor Circuit Board



7.1.1 REMOVING THE SENSOR CIRCUIT BOARD

Figure 7-1 shows the Sensor Circuit Board. It may be accessed by first unscrewing the mesh filter. Then holding the sides of the sensor tip gently pull out in a straight pulling motion. Do not move the tip from side to side as this can damage the connectors.
Avoid touching the components on the tip board.

Note: The relative humidity sensor can be seen mounted near the tip of the board, at the right of Figure 7-1. This is fragile. Take care not to break it during board removal or installation.

7.1.2 SENSOR REASSEMBLY

Carefully plug the new sensor circuit board into the socket, noting that it is installed at the correct angle and that the keyway is properly aligned. Using your thumb or a small screwdriver or other tool, press it down sufficiently so that it is fully inserted in the socket. Note that the sensor can be installed in any direction and the system will correct its self

Finally, screw in the mesh filter over the circuit board.

8.0 SPECIFICATIONS

Note: See Table 3-2 for actual measurement ranges.

HP125 (Sensor Only)

Measured Parameters	RH/Temp.
Relative Humidity	±1.8% @ 23°C (0 TO 90% RH)
Temperature	±0.5°C
Output Information	RH, Temp., DP
Electrical Outputs	0 to 10 Vdc (X3) & RS-232C

HPP125 (Sensor Only)

Measured Parameters	RH/Temp./ Pressure
Relative Humidity	±1.8% @ 23°C (0 TO 90% RH)
Temperature	±0.5°C
Pressure	±1 mbar @ 25°C (600 to 1200 mbar) / ±5mbar (-40°C to +125°C)
Dew Point	± 1°C for –10°C to 95°C DP and ± 2°C for –40°C to –10°C
Output Information	RH, Temp., Pressure
Electrical Outputs	0 to 10 Vdc (X4) &RS-232C

HPB125 (Sensor Only)

Measured Parameters	RH/Temp./ Barometric Pressure
Relative Humidity	±1.8% @ 23°C (0 TO 90% RH)
Temperature	±0.5°C
Pressure	±1 mbar @ 25°C (600 to 1200 mbar) / ±5mbar (-40°C to +125°C)
Dew Point	± 1°C for –10°C to 95°C DP and ± 2°C for –40°C to –10°C
Output Information	RH, Temp., Pressure
Electrical Outputs	0 to 10 Vdc (X4) &RS-232C

HP125- DCM- (Electronics Unit with Built-in Sensor)

Measured Parameters – RH/Temp.
RH Accuracy – +/- 1% RH
Temp. Accuracy – +/- 0.5ºC
Output Information – RH, Temp., DP
Electrical Outputs – 4 to 20 mA (X3)
RS-232C
Alarm Relays (X2)
Digital Display – LCD, 2-line

Electrical Outputs

Systems with Sensor only –

0 to 10 Vdc (X 4) @ 10 mA max.
RS-232C

Systems with Sensor and Electronics Unit—

Configurable 4-20mA, 0-10V & 0-5V (X2) into 500 Ω max.
Alarm Relay (X2) Form A (SPST, NO) rated at 3A/250 Vac
RS-232C (bi-directional)

Serial Output (Electronics unit)

RS-232C to DTE device. 19.2 kilobaud, 8 bits data, 1 stop bit, no parity

Power Requirements

24V±10%, 1A max.

Dimensions

Remote Sensor – Diameter: 1/2 in. OD (1.3 cm)
Length: 9.5 inches (24.13 cm)

Cable Length – 3 feet (1M) Optional 6 feet (2M)
Consult Factory for longer lengths.

Electronics Module, Model DCM –

Outside Dimensions (HWD)
5.11 X 5.11 X 3 inches (13 X 13 X 7.6 cm)
Mounting Centers
4.5 2 X 4.52 inches (11.5 X 11.5 cm)

Electronics Module with Built-in Sensor –

Wall Mount – Outside Dimensions (HWD)
5.1 X 5.1 X 3.0 inches (13 X 13 X 7.6 cm)
Mounting Centers
4.52 X 4.52 inches (11.5 X 11.5 cm)
Duct Mount – Outside Dimensions (HWD)
3.74 X 6.8 X 2.0 inches (95 X 17.3 X 5.1 cm)
Mounting Centers
2.7 X 6.4 Inches (6.9 X 16.2 cm)

Sensor Pressure Rating

800 psia maximum

Sensor Mesh Filter

Material – Stainless Steel

Dispose of the unit according to statutory regulations. Do not dispose of with regular household refuse.

9.0 APPENDIX

9.1 Warranty Information

9.2 Mounting Dimensions

9.3 Basic Humidity Definitions

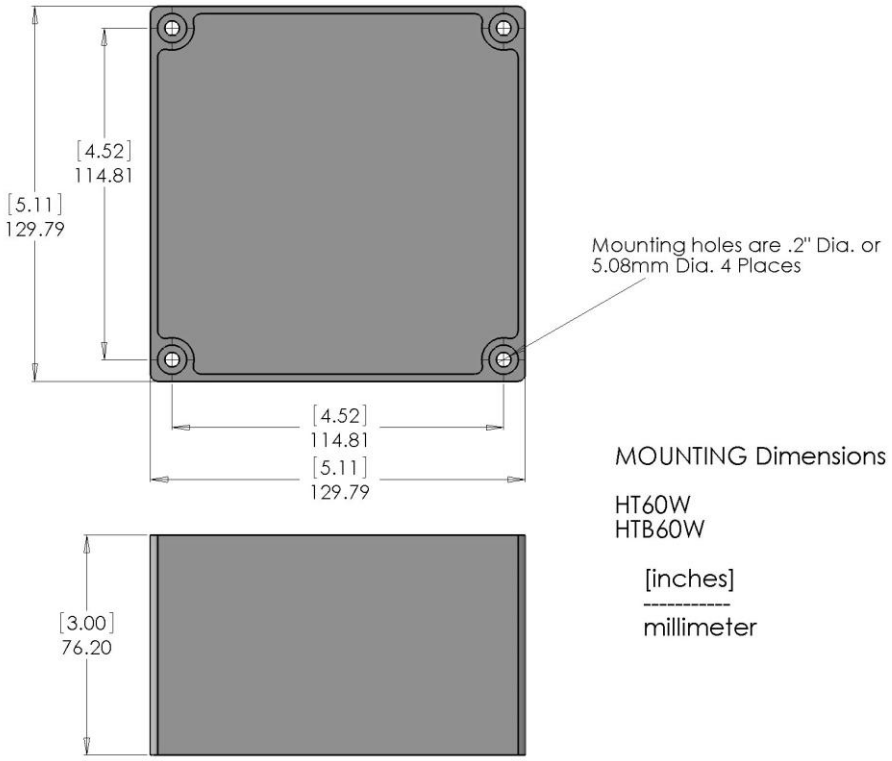
9.1 WARRANTY INFORMATION

All equipment manufactured by EdgeTech is warranted against defective components and workmanship for repair at their plant in Massachusetts, USA, free of charge, for a period of twelve months. Malfunction due to improper use is not covered in this warranty and EdgeTech disclaims any liability for consequential damage resulting from defects in the performance of the equipment. No product is warranted as being fit for a particular purpose and there is no warranty of merchantability. This warranty applies only if (i) the items are used solely under the operating conditions and in the manner recommended in the instruction manual, specifications, or other literature; (ii) the items have not been misused or abused in any manner or repairs attempted thereon; (iii) written notice of the failure within the warranty period is forwarded to EdgeTech and the directions received for properly identifying items returned under warranty are followed; and (iv) the return notice authorizes EdgeTech to examine and disassemble returned products to the extent EdgeTech deems necessary to ascertain the cause for failure. The warranties expressed herein are exclusive. There are no other warranties, either expressed or implied, beyond those set forth herein, and EdgeTech does not assume any other obligation or liability in connection with the sale or use of said products.

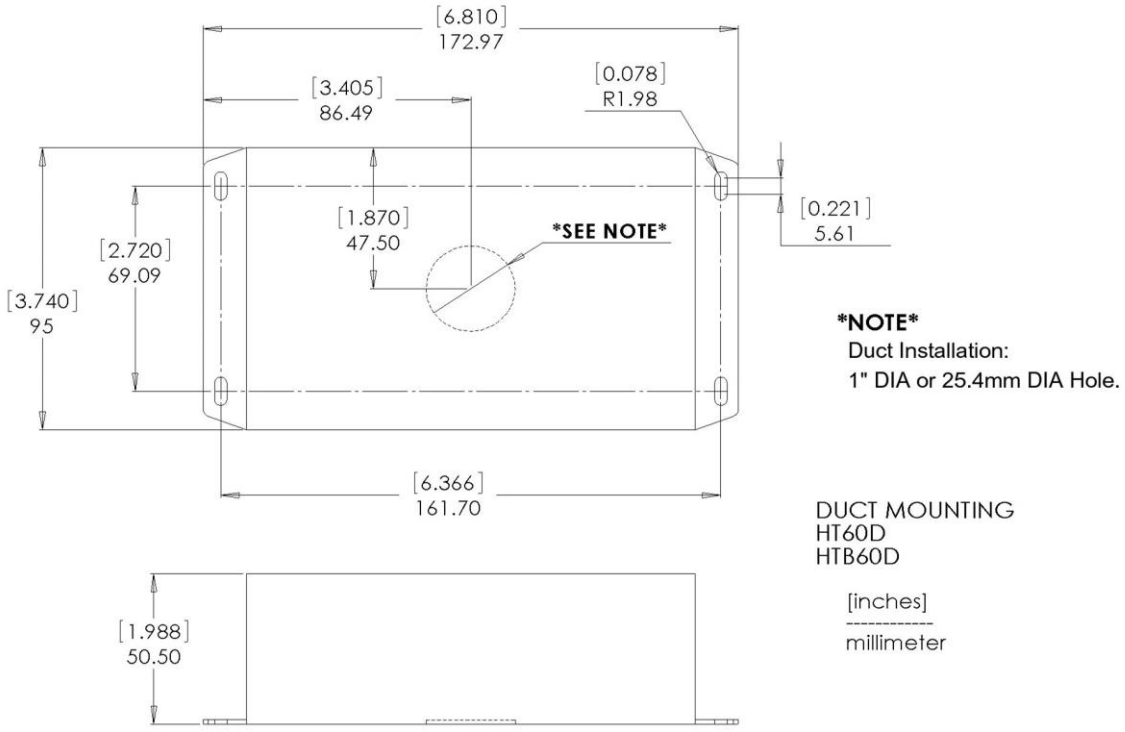
Equipment not manufactured by EdgeTech is supported only to the extent of the original manufacturer’s warranties.

9.2 OVERALL AND MOUNTING DIMENSIONS

9.2.1 WALL MOUNT DIMENSIONS



9.2.2 DUCT MOUNT DIMENSIONS



Notes