1 YEAR
WARRANTY

ΩΕ OMEGA™ User's Guide

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INTRODUCTION

Omega's Model HHF142 digital anemometer is a versatile instrument for measuring air velocity in various applications such as HVAC, aerospace development, industrial process airflow, and fluids research.

Air Volume flow is automatically calculated in units of either cubic feet per minute (ft^3/min) or cubic meters per hour (m^3/hr).

The rugged yet precise probes can be used for airstreams that have a wide range of humidity, temperature, and contaminants without compromising accuracy.

Features include choice of probe diameters, custom cable lengths, service temperatures up to 212˚F (100˚C) at the probe, high reliability, and long life.

This manual has been prepared for both HHF141A (1.00" probe) and HHF141B (2.75" probe) models including all optional outputs.

IMPORTANT SAFETY INFORMATION
Classifications

Danger: To Prevent Serious Injury or Death
Warnings in this classification indicate danger that may result in serious injury or death if not observed.

Caution: To Prevent Damage to the Product
Warnings in this classification indicate risks of damage to the product that may void the product warranty and/or calibration.

Description of Symbols

ESD Caution: To Prevent Damage to the Product
Warnings in this classification indicate risks of damage to the product that may void the product warranty and/or calibration. Internal components are static sensitive and are not user serviceable. Opening the cases by a non-authorized service center and/or in a non-ESD safe environment may cause damage not covered by the manufacturer's warranty.

Important: Mandatory Action Required
The specific action is given near this symbol.

COMPLIANCE INFORMATION

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular situation.

EU – Declaration of Conformity

Miltronics Mfg. Svcs., Inc. (the manufacturer) declares that the product for this manual demonstrates compliance with the requirements of:
- European Community Council Directive 2014/30/EU

A copy of the Declaration of Conformities (DoC) is available on request from the address found in this manual, on the last page.

UKCA – Declaration of Conformity

Miltronics Mfg. Svcs., Inc. (the manufacturer) declares that the product for this manual demonstrates compliance with the requirements of:
- UKCA Electromagnetic Compatibility Regulations 2016.

A copy of the Declaration of Conformities (DoC) is available on request from the address found in this manual, on the last page.

RoHS Statement

Miltronics Mfg. Svcs., Inc. (the manufacturer) declares that to the best of our knowledge, based on supplier provided information, the product for this manual demonstrates compliance with the requirements of:
- RoHS Directive: 2015/863/EU
- Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended): Great Britain
- Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended): Northern Ireland

and is not intentionally manufactured with, formulated with, or contains amounts greater than maximum concentration values by weight in homogenous materials of the following substances:
- Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr VI), Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE), Bis(2-Ethylhexyl) phthalate (DEHP), Benzyl butyl phthalate (BBP), Dibutyl phthalate (DBP), and Di isobutyl phthalate (DIBP): 0,1 % or 1000 ppm
- Cadmium (Cd): 0,01 % or 100 ppm

Please be advised that we do not analyze for these substances.

WEEE – Waste Electrical and Electronic Equipment - 2012/19/EU

Miltronics Mfg. Svcs., Inc. (the manufacturer) asks that all our products to be recycled at the end of their current use, to comply with local waste requirements. We support local Waste Electrical and Electronic Equipment (WEEE) directives where they are in operation. That means that WEEE products may not be disposed as unsorted municipal waste but is to be collected separately. These products are therefore labeled with a crossed-out "wheelie-bin" symbol which you can see above. WEEE products may contain hazardous substances which may negatively affect the environment and human health when disposed of through normal channels. We are committed to reduce the negative environmental and human health effects of WEEE.

DANGER

 Never touch the vane assembly blades and/or thermal sensors.

The vane assembly blades may contain sharp edges which may cause minor cuts. The assembly contains precision bearings which are sensitive, and the blades are finely adjusted to specific pitches. Touching this assembly or its parts may cause damage which can affect its operation and the calibration.

NOTE: If the vane assembly head or probe head requires cleaning, we recommend a fine mist of isopropyl alcohol and a fine long-haired brush or send the unit in or servicing.

 Do not disassemble or heat the batteries or put them into a fire.

They may cause burns and the batteries may burst. Please dispose of used batteries in the proper manner per local ordinances.

CAUTION

 When measuring, ensure that the direction arrow is facing the direction of airflow.

The arrow indicates the direction of airflow for the data provided on the calibration certificate. It is meant to allow for uniform and consistent readings as per the provided data. The probe will operate in the opposite direction, but the data may be different.

 Do not use or leave the instrument in a high temperature, high humidity, high speed airflows or dusty environments for prolonged periods.

The instrument may not function properly out of the specified operating conditions and/or have a greatly reduced operating life span.

 Do not subject the instrument or the probe to strong impacts.

Dropping the instrument or the probe may cause damage or malfunction to the instrument and may change the calibration data. We recommend sending it in immediately to be checked.

CAUTION (continued)

⚠️ **Never disassemble, modify, or repair the product.**
Failure to observe the above may cause damage to the instrument or the probe. It may also void the manufacturer's warranty and calibration certificate.

⚠️ **Do not pick up or carry the instrument by the cable.**
It may cause a malfunction or damage to the wiring of the cable.

⚠️ **Remove the batteries from the instrument when storing for long periods of time. When inserting the batteries, be sure to insert them with the polarity facing the correct direction.**
Failure to do so may cause battery leakage and subsequent damage to the instrument. The manufacturer does not recommend any specific brand of batteries, but a high-quality name brand alkaline battery seems to last the longest.

⚠️ **Do not wipe the instrument with a volatile solvent.**
Use neutral solvents and simple cleaners to clean the instrument with a soft cloth.

⚠️ **Regularly check the head of the probe for contamination. Impurities (such as dust) on the blades and/or thermal sensor may affect the accuracy of the instrument.**
NOTE: If the vane assembly head or probe head requires cleaning, we recommend a fine mist of isopropyl alcohol and a fine long-haired brush or send the unit in or servicing.

When storing or shipping the instrument, the manufacturer recommends disconnecting the cable(s) and returning it to the original carrying case.

SECTION 1 - SPECIFICATIONS

Ranges:

Probe AP275:   50 to 7800 ft/min   (feet per minute)
                           0.25 to 39.60 m/sec   (meters per second)

Air Probe AP100:   300 to 6890 ft/min (1.50 to 35.00 m/sec)

Calculated Air Volume Flow:
                           0.0 to 9999 ft^3/min   (cubic feet per minute)
                           0.0 to 9999 m^3/hr   (cubic meters per hour)

Accuracy:

Air Velocity: **AP275:** ± 1.0% of reading ±1 digit
                   AP100: ± (0.50% of F.S. + 0.75% of reading + 1 digit)

Resolution: 1 ft/min or 0.01 m/sec
                           0.1 ft^3/min or 0.1 m^3/hr

Operating Temperature:

Instrument: 32˚ to 125˚F (0˚ to 50˚C)
Probes: -4˚ to 212˚F (-20˚ to 100˚C)

Power Supply: 3 AA alkaline batteries

Battery Life: Approx. 150 hours, without backlight

Battery check: Automatic low battery display

Display: 0.5" LCD, 4 digits, with LED backlight

OPTIONS AND COMPONENTS

Options Available:

- Protective Boot and Splash-Proof Seal for the Instrument
- USB Communications
- RS232 Communications
- Analog 0-5 Volt Output
- Wall Transformer Power for the Instrument (US only)
- Additional Probes, 2.75-inch diameter or 1 inch diameter
- Extra extension and/or flexible rods
- 8-ft Telescopic Extension Rod
- Custom cable lengths, in 5-ft increments, up to 100-ft (30-meters).
- Custom probe connections.

Included:

- (1) HHF141 Instrument
- (1) Vane-type probe head, choice of 2.75-inch diameter or 1 inch diameter
- (3) Rigid extension rods with handle grip
- (1) Flexible extension rod
- (1) Probe connection cable, 5 ft.
- (3) Size AA 1.5V alkaline batteries (installed in instrument)
- (1) Hard-shell carrying case with foam liner
- (1) Operation Manual

DIMENSIONS

INSTRUMENT

6.26 Inch
160 mm

1.32 Inch
34 mm

3.07 Inch
78 mm

2.75 INCH PROBE

⌀ 2.75 INCH
70 MM

MOUNTING BOSS WITH
3/8-16 UNC TAPPED HOLE
.750 INCH DEEP

ELECTRICAL
CONNECTOR

.875 INCH
22 MM

4.9 INCH
124 MM

1.7±.010 INCH
43 MM

1 INCH PROBE

3/8-16 TAPPED HOLE
0.75 INCH DEEP

⌀ 1.0 inch
25 mm
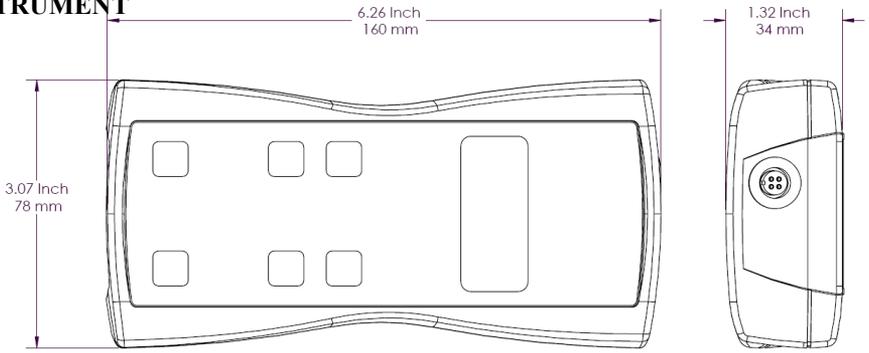
1.1 inch
28 mm

5.5 inches
140 mm
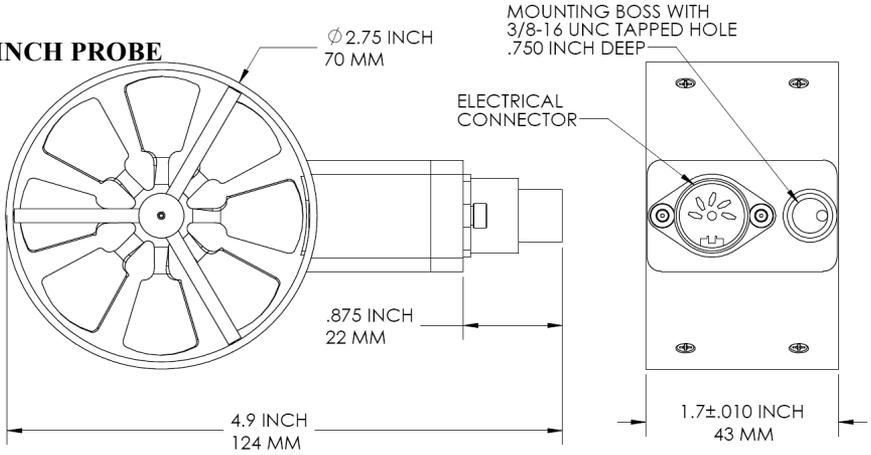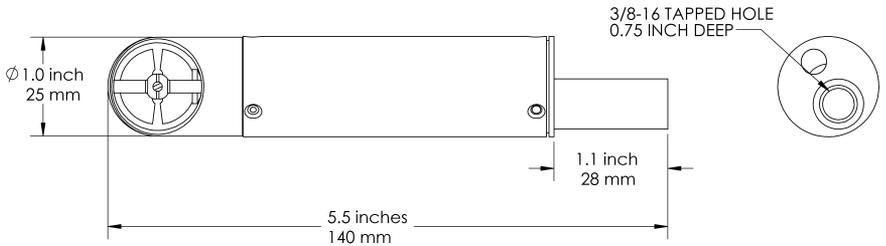
SECTION 2 – SWITCH FUNCTIONS

MODEL HHF142
VOLUME FLOW
ANEMOMETER

FPM / MPS

MAX / MIN

SAMPLE RATE ◄

HOLD / RESET

ADJ   **VOLUME FLOW SETTINGS**   SET

🔦   VOLUME FLOW   ⏻
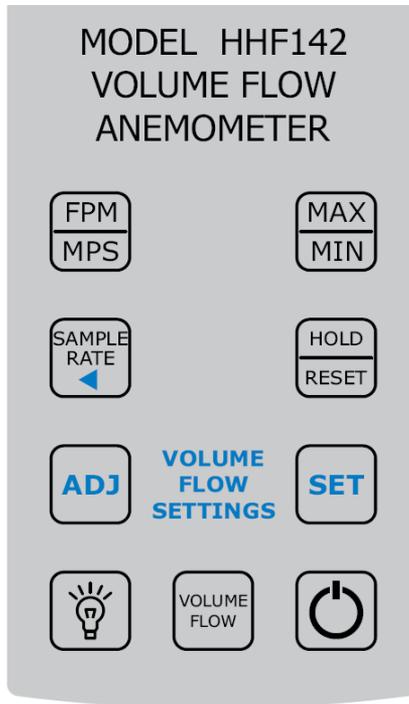
Pressing the ON/OFF key switches the instrument ON. Hold down the key for 2 seconds to switch the unit OFF. The unit will automatically power off after 30 minutes without any key presses. To disable auto power-off, hold down the power button during turn-on. The unit will flash AOFF, which means that the auto power-off has been disabled.   The auto power-off is re-enabled each time the instrument is turned on.

Press the BACKLIGHT key to turn the LCD backlight on for 30 seconds.   To turn the backlight on permanently, hold the backlight key down for 3 seconds. The LCD will flash. The backlight is now switched on permanently. To switch the backlight off, press the backlight key again.

Press the FPM/MPS key to switch the measurement units from FPM (feet per minute, 1 FPM resolution) to MPS (meters per second, 0.01 MPS resolution).

SECTION 2 – continued

SAMPLE RATE Press the SAMPLE RATE key to change the measurement averaging rate ("sample rate") of the unit:

2 SEC An average value of airspeed measurements during the preceding 2 seconds is displayed.

4 SEC An average value of airspeed measurements during the preceding 4 seconds is displayed.

8 SEC An average value of airspeed measurements during the preceding 8 seconds is displayed.

16 S An average value of airspeed measurements during the preceding 16 seconds is displayed.

MAX MIN Press the MAX/MIN key to record and display the maximum airspeed reading. The maximum airspeed reading display will alternate with the letter "H" displayed with the sample rate. Press the MAX/MIN key again to record and hold the minimum airspeed reading. The minimum airspeed reading display will alternate with the letter "L" displayed with the sample rate. For example:

1065 alternating with **H 8** signifies that 1065 is the highest airspeed reading since the MAX/MIN key was pressed, and the sample rate is set to 8 seconds.

82 alternating with **L 16** signifies that 82 is the lowest airspeed reading since the MAX/MIN key was pressed, and the sample rate is set to 16 seconds.

To exit MAX/MIN mode, press the SAMPLE RATE key.

HOLD RESET Press the HOLD/RESET key to freeze the current reading on the display. **HOLD** is displayed on the LCD and the reading is held.

Press the HOLD/RESET key a second time to clear this mode and return the unit to normal operation.

Press the HOLD/RESET key while in MIN/MAX mode to display BOTH the minimum and maximum airspeed reading since the MAX/MIN key was pressed. Once the HOLD/RESET key is pressed while in MAX/MIN mode, new airspeed readings are no longer recorded. To return to MAX/MIN mode, press the HOLD/RESET key again.

VOLUME FLOW Press the "VOLUME FLOW" key to enter Volume Flow mode. Press it again to exit Volume Flow mode and return to Airspeed mode.

SECTION 2 – continued

ADJ While in Volume Flow mode, or Airspeed mode, press "ADJ" to select which Duct setup you'd like to use when in Volume Flow mode. There are 10 Duct setups to choose from and they are shown as **DUC0** through **DUC9**.

While in Volume Duct Entry mode, press this key to advance to begin editing a setting, or to adjust a setting, like changing units from **INCH** (inches) to **CENT** (centimeters), or incrementing a duct size by 1 unit.

SET While in Volume Flow mode or Airspeed mode, press "SET" to enter Volume Duct Entry mode. This allows you to edit the Duct settings for the currently selected Duct setup.

While in Volume Duct Entry mode, press this key to accept a value. For example, pressing "ADJ" will toggle the units setting between **INCH** and **CENT**. Pressing "SET" will accept the currently displayed value and advance you to the next menu.

SAMPLE RATE ◄ Press the SAMPLE RATE key while adjusting duct sizes to move one digit to the left. This will allow you to go back and adjust the digit you have just set.

HOLD RESET Press the HOLD/RESET key at any time while adjusting duct sizes to exit the duct size adjustment. Any changes you have made to duct sizes **are not saved**.

Duct Size Entry example:
The following example shows how to enter the dimensions of a 12-inch x 12-inch rectangular duct and save this duct at Duct # 4 in memory.

1. Turn the DA410 on.
2. Once turned on, press the "ADJ" key. Continue pressing and releasing until DUC4 is displayed. This now selects Duct setup 4.
3. Press the "SET" key to enter Volume Duct Entry mode. The display shows UOL stating that we're in Volume Duct Entry mode, then shows the Duct setup selection of DUC4, and then stops at UNIT. Press the "ADJ" key to enter the Units menu.
4. Press and release the "ADJ" key to toggle between INCH and CENT. This determines whether the units will be in Inches or Centimeters.
5. Once INCH has been displayed, press the "SET" key to accept Inches as the Units.
6. The display now shows DUCT stating that we're now in the Duct Type menu. Press the "ADJ" key to enter the Duct Type menu.
7. Press and release the "ADJ" key to toggle between RECT and CIRC. This determines whether the Duct type will be a Rectangular duct or a Circular duct.
8. Once RECT has been displayed, press the "SET" key to accept Rectangular duct as the Duct type.
9. The display now shows HEIT stating that we're now in the Height Entry menu. Press the "ADJ" key to enter the Height Entry menu. The Height can now be edited one digit at a time.
10. To enter in 12.0 inches, press the "SET" key to accept 0 and move to the cursor to the right, press the "ADJ" Key to increment the current digit to 1 , press the "SET" key to accept 1 and move to the cursor to the right, press the "ADJ" Key twice to increment the current digit to 2 , press the "SET" key to accept 2 and move to the cursor to the right, press the "SET" key to accept 0 and to finish the editing of the Duct Height. (*Note: The blinking digit is the current digit for editing. To increment the current digit, the "ADJ" key can be pressed. To save the current digit and move the cursor to the right, the "SET" key can be pressed. If a digit needs to be edited again, the "SAMPLE RATE/Arrow" key can be pressed to move the cursor to the left again.*)

11. The display now shows **LEՈ** stating that we're now in the Length Entry menu. Press the "ADJ" key to enter the Length Entry menu. The Length can now be edited one digit at a time.

12. To enter in 12.0 inches, press the "SET" key to accept 0 and move to the cursor to the right, press the "ADJ" Key to increment the current digit to 1 , press the "SET" key to accept 1 and move to the cursor to the right, press the "ADJ" Key twice to increment the current digit to 2 , press the "SET" key to accept 2 and move to the cursor to the right, press the "SET" key to accept 0 and to finish the editing of the Duct Length.

13. The display now shows **DOՈE** which means that we've completed the Duct setup and are exiting Volume Duct Entry mode.

14. Now press the "VOLUME FLOW" Key to enter Volume Flow Mode.

15. A 12" x 12" Rectangular duct can now be measured for Volume Flow. *(Note: To get an accurate reading, increase the sample rate to 16 Seconds by pressing the "SAMPLE RATE" key. Then slowly move the air probe around the entire duct opening to get an average reading across the duct opening. This will give a more accurate value for the volume flow rate out of the duct.)*

The following page shows a graphical representation of the steps required to enter the duct dimensions into the HHF142.

SET

"VOL"

"duc1" *(the current duct setup being modified)*

"Unit"
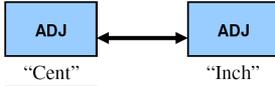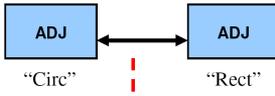
ADJ ⟷ ADJ
"Cent"   "Inch"

SET

"Duct"

ADJ ⟷ ADJ
"Circ"   "Rect"

SET   SET

"Dia"   "Heit"   "Len"

ADJ   ADJ   ADJ
"000.0"   "000.0"   "000.0"

ADJ   ADJ   ADJ
"100.0"   "100.0"   "100.0"

SET   SET   SET
"100.0"   "100.0"   "100.0"

SET   SET   SET
"100.0"   "100.0"   "100.0"

SET   SET   SET
"100.0"   "100.0"   "100.0"

SET   SET   SET

DONE   DONE
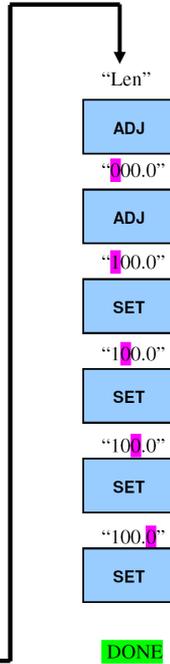
SECTION 2 – continued

FPM
MPS
While in Volume Flow Mode, press the FPM/MPS key to switch between units of **cubic feet per minute** (CFM) and **cubic meters per hour** (CMH). **CUBIC** will be displayed along with either **FPM** or **MPS** on the LCD display to tell you what units you are in.

Note: When **CUBIC** and **MPS** are displayed on the LCD display, the reading displayed is in units of CUBIC METERS PER **HOUR**.

Duct Dimension Reference Table

The following reference table can be used to record which duct dimensions are stored under which Duct Number in your HHF142 Anemometer.

Duct #	Length	Height	Diameter	Description
Duct 0				
Duct 1				
Duct 2				
Duct 3				
Duct 4				
Duct 5				
Duct 6				
Duct 7				
Duct 8				
Duct 9				

SECTION 3 – OPERATIONAL NOTES

Caution: Do not attempt to measure flow from a duct that is smaller than the diameter of the probe head that you are using. This will cause a false reading. Follow the minimum duct cross-section guidelines as detailed below:

2.75-inch Air Probe: Minimum duct width of 2.7 inches (69 cm)
                              Minimum duct height of 2.7 inches (69 cm)
                              Minimum duct diameter of 2.7 inches (69 cm)

1 Inch Air Probe: Minimum duct width of 1.0 inches (2.7 cm)
                              Minimum duct height of 1.0 inches (2.7 cm)
                              Minimum duct diameter of 1.0 inches (2.7 cm)

9009 - Out of Range Error: There are a few circumstances which will cause the instrument to display **9009**, which is the out-of-range error. They are:

1. **Duct dimension is too small:** If one of the user-entered duct dimensions is smaller than the probe diameter as described above, the instrument will display the out-of-range error.
2. **Duct cross-sectional area is too large:** If the cross-sectional area of the duct is too large, the instrument will not be able to display a meaningful result. The out-of-range error will be displayed. The maximum duct cross-sectional areas are as follows:
   a. 35 ft^2 (3.25 m^2) when displaying in cubic feet per minute (CFM)
   b. 20 ft^2 (1.86 m^2) when displaying in cubic meters per hour (CMH)
3. **Volume flow rate is too high:** If the calculated volumetric flow rate is higher than 9999 cubic feet per minute (CFM) or 9999 cubic meters per hour (CMH) the result cannot be displayed by the instrument. The out-of-range error is displayed.

APPENDIX A – LCD DISPLAY SYMBOLS
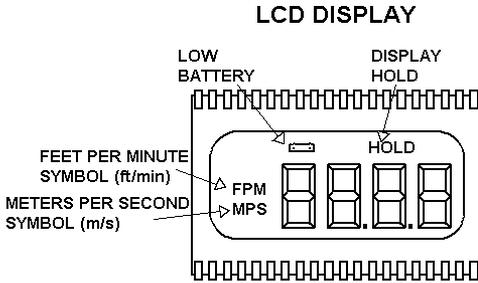

APPENDIX B – BATTERY REPLACEMENT
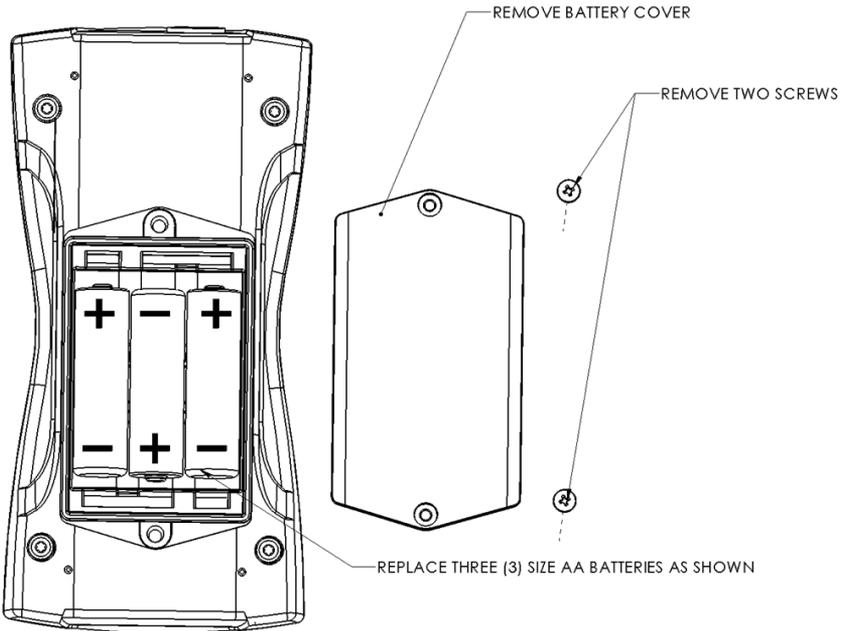
APPENDIX C – AIRFLOW VOLUME CALCULATIONS

To calculate cubic feet per minute (CFM) from a measured air velocity (FPM), you need the calculated cross-sectional area of the air flow stream:
> Volume Flow (CFM) = Velocity (FPM) X Area (sq ft).

In a rectangular duct this cross-sectional area equals the Width times the Height.
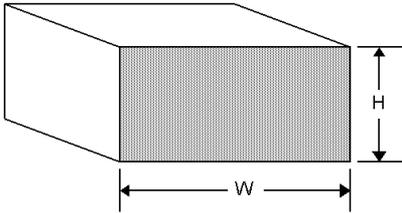
W x H=A (cross-sectional area)

In a circular duct this cross-section area equals the radius squared times π (3.14).
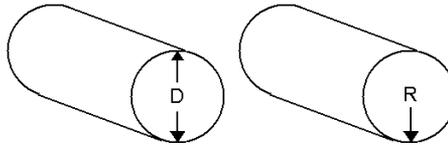
R x R x 3.14=A (cross-sectional area)

To convert an area calculated in square inches to an area calculated in square feet (which is required for the Volume Flow equation above) divide by 144: (area in sq in.)/144 = (area in sq ft.).

Example: The air duct is rectangular; the width is 24 in., and the height is 12 in. The air velocity reading through the duct is 450 FPM. Calculate the Volume Flow.

Step 1: Cross-sectional area = 24 in. x 12 in. = 288 sq in.
Step 2: 288 sq in /144 = 2 sq ft.
Step 3: Volume flow = Air Velocity x Area, therefore,
Volume flow rate = 450 FPM x 2 sq ft. = 900 CFM.

APPENDIX D – ANALOG OUTPUTS (IF EQUIPPED)

If the instrument is equipped with the analog output option, there will be a five-pin connector on the bottom of the instrument. Also, an analog output cable will be included with the instrument. This cable will have a five-pin connector on one end and four tinned wires on the other end.

The instrument will output a Voltage between 0 and 5 Volts that corresponds to the Air Velocity measured by the instrument. The output range, pin assignments, and wire colors are given in the table below. Also shown is a block diagram of the analog output circuit.

Wire Color	Pin #	Function	Analog Output Voltage Range	Corresponding Measurement Range	Equation* to convert from Volts (*V*) to Measurement Value
BLK	1	Ground	--- N/A ---	--- N/A ---	--- N/A ---
GRN	2	Air Velocity	0 to 5 Volts	0 to 10,000 FPM	Air Velocity = $2000 \times V$
GRY	3	--- Not Used ---	--- N/A ---	--- N/A ---	--- N/A ---
WHT	4	--- Not Used ---	--- N/A ---	--- N/A ---	--- N/A ---

*To convert from Volts to Air Velocity in Feet per Minute, multiply by 2000.
- ► For example, an analog output of 2.375 Volts means that the instrument is measuring an air velocity of 4750 feet per minute (FPM).
- ► 2.375 Volts × 2000 = 4750 FPM

**Note:** When using analog outputs, there is an **additional ±1% error** in the analog output voltage. This is in addition to the normal measurement error.
- ► For example, an air velocity reading of 500 FPM would normally have an accuracy of ±1% of reading ±1 digit (±6 FPM) when the data is viewed on the LCD display.
- ► With the additional error associated with the analog output voltage, the effective accuracy of the analog output for this air velocity measurement will be ±2% of reading ±1 digit (±11 FPM).

Custom Analog Voltage Outputs are also available – contact Omega for details.

Analog Output circuit block diagram and connector pin assignment

NOT USED — 390 Ohm Resistor

NOT USED — 390 Ohm Resistor

Air Velocity Analog Voltage Output — 390 Ohm Resistor

4
3
2
1
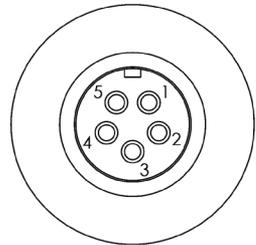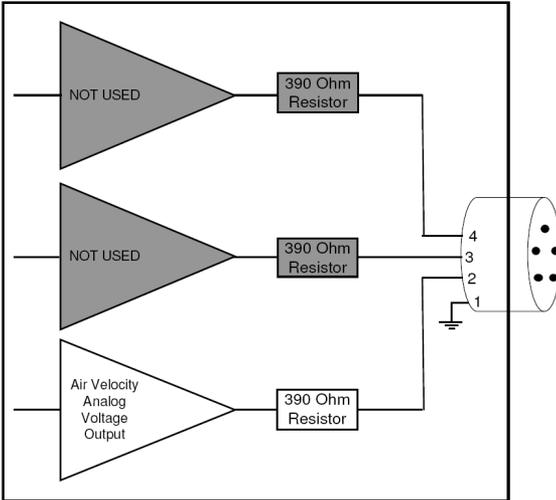
ANALOG OUTPUT CONNECTOR
PINOUT DIAGRAM

Mating Cable Connector:
Binder Part No. 99-0413-00-05

APPENDIX E - USB DATA OUTPUT (IF EQUIPPED)

If the instrument is equipped with the USB Communications option, there will be a four-pin male connector on the bottom of the instrument. Also, a USB cable will be included with the instrument. This cable will have a four-pin female connector on one end and a USB Type-A connector on the other end.

USB Data Output – Instructions for Use

STEP 1: Install a Virtual COM Port (VCP) Driver on your computer.
Free VCP drivers can be downloaded for Windows, Linux, and MAC from FTDI Ltd on their website:
http://www.ftdichip.com/Drivers/VCP.htm

We recommend downloading the setup executable, which automatically runs and configures the drivers for you.

STEP 2: Connect the USB cable (included) to the male connector on the bottom of your instrument. Connect the other end to a USB port on your computer.

STEP 3: Turn the Instrument ON.

STEP 4: Verify that the Instrument has been set up as a USB Serial Port with a unique COM port number. (You only need to do this once)

For Windows users, open the Windows Device Manager (found in Control Panel) and verify that a USB serial port exists as shown below.

APPENDIX E – continued
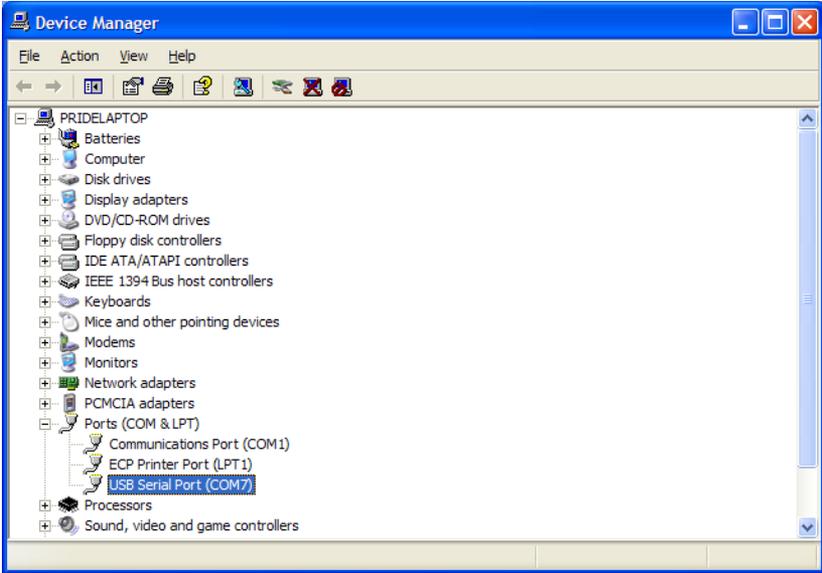
You are now ready to capture the data being measured by your instrument.

Please refer to **Appendix G – Viewing and Capturing Data** for further instructions.

NOTE: Units with USB or RS232 communications, output only Air data at this time. Temperature data is not available on the output.

APPENDIX F – RS232 COMMUNICATIONS (IF EQUIPPED)

If the instrument is equipped with the RS232 Communications option, there will be a three-pin male connector on the bottom of the instrument. Also, an RS232 cable will be included with the instrument. This cable will have a three-pin female connector on one end and a DB9 Female connector on the other end.

RS232 Data Output – Instructions for Use

STEP 1: Connect the RS232 cable (included) to the female connector on the bottom of your instrument. Connect the other end to an RS232 port on your computer.

STEP 3: Turn the Instrument ON.

STEP 4: Verify that the Instrument has been set up as a RS232 Serial Port with a unique COM port number. (You only need to do this once). For Windows users, open the Windows Device Manager (found in Control Panel) and verify that a serial port exists.

You are now ready to capture the data being measured by your instrument.

Please refer to **Appendix G – Viewing and Capturing Data** for further instructions.

APPENDIX G – VIEWING AND CAPTURING DATA
## (IF EQUIPPED WITH EITHER USB OR RS232 OUTPUTS)

NOTE: HyperTerminal is no longer included with Windows Vista or later packages. Previous manuals referenced this program. We now reference, Parallax Serial Terminal.

There are many terminal emulator programs available on the market. It is up to the end-user to determine which program is compatible with his/her system, what settings it may require, and the Omega Engineering product being used. Omega Engineering does not endorse or recommend any of these programs and assumes no liability for their use.

There are many ways to capture the serial port data from the instrument. The simplest method is to use a terminal emulator program.

Using a terminal emulator allows the serial COM port to be opened, with the below port settings, and real-time data to be viewed from the instrument. One such terminal emulator program is Parallax Serial Terminal, available from www.parallax.com.

Open the Parallax Serial Terminal, based on how you installed the program onto your computer. The below screen will come up.
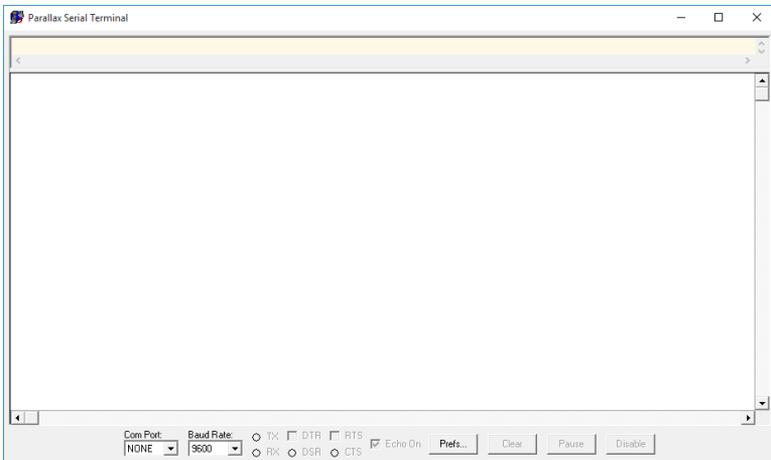

Attach your instrument & probe to your computer via the USB cable.
Select the appropriate 'Com Port:'. In the below example, COM5 is being used.
Set the 'Baud Rate:' to 9600

APPENDIX G – continued
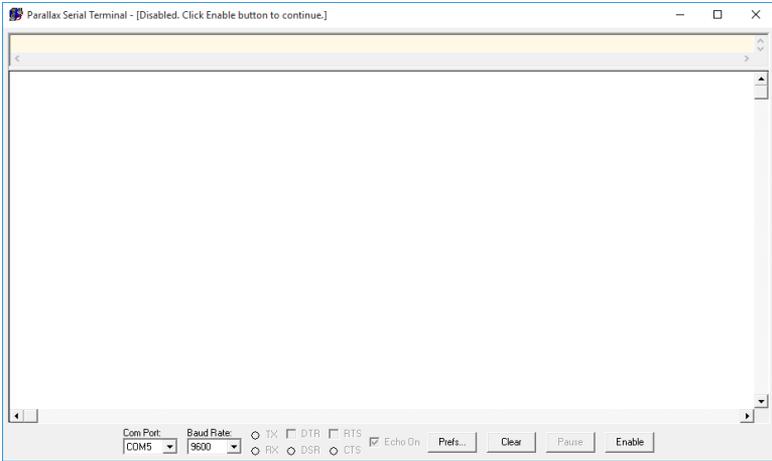
You will now receive data from your instrument. The graphic below shows the serial port output data from Parallax Serial Terminal when connected to an Omega HHF142 Instrument. Graphics may vary.
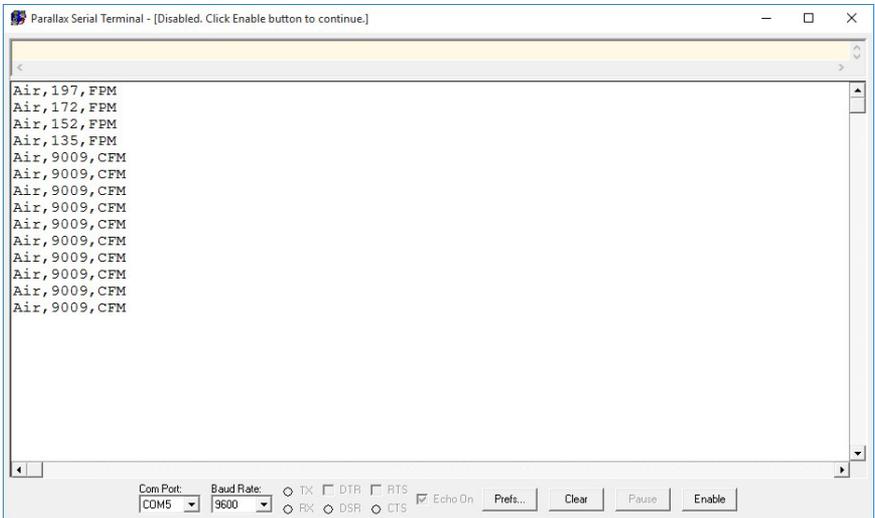
APPENDIX G – continued

Serial Port Settings
Bits per Second (Baud)   9600

Serial Port Protocol
Data Output Interval   One Second
Data Format   Comma-Separated Values (CSV)
Measurement Units   Same as Units shown on LCD Display

Below are examples of the formatted output data for Omega Engineering HHF141-HHF144 Series Instruments (units may be different depending on the units selected on the LCD display):

Model HHF141:   Air,47, FPM

Model HHF142, in Air Velocity Mode: Air,47, FPM
Model HHF142, in Volume Flow Mode: Air,251, CFM

Model HHF143:   Air,47, FPM

Model HHF144:   Air,47, FPM

Exporting and Graphing Data

Exporting serial port instrument data from the Pacer Instrument to a spreadsheet application such as Microsoft Excel or OpenOffice Calc allows the data to graphed or recorded.

The simplest way to export the instrument data is to use a terminal emulator program, like Parallax Serial Terminal, and either capture the serial data/text to a file (menu selection) or to manually highlight, copy, and then paste the instrument data into an editor such as Windows Notepad.

Once you have the instrument data in a file, save the file as a .CSV type (e.g., InstrumentData.csv).

Open the file in a spreadsheet application such as Microsoft Excel or OpenOffice Calc. A graph of the data as shown below can now be generated.
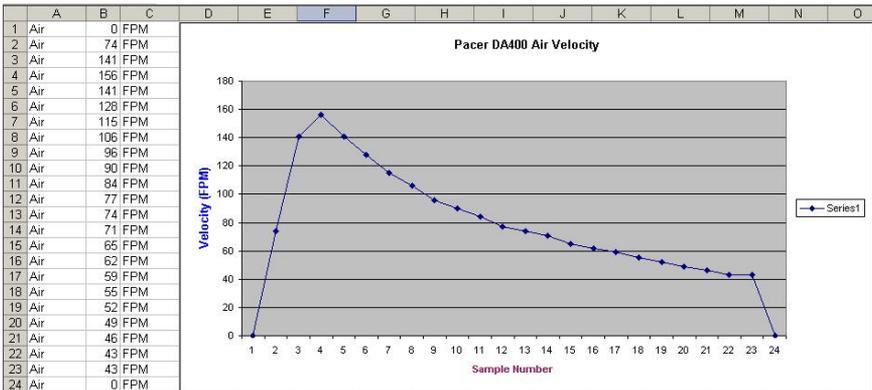
Notes:

Notes:

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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