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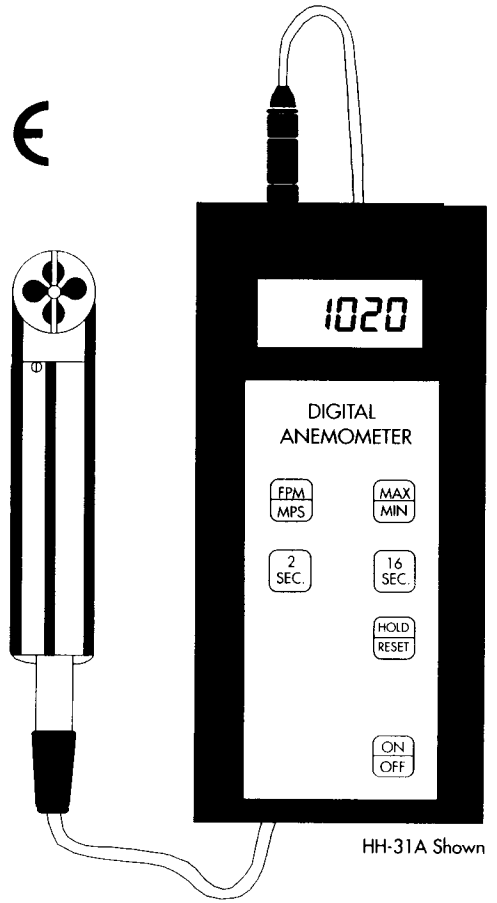
M2367/0896

User's Guide

CE



HH-31A Shown

OMEGA
An OMEGA Technologies Company
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HH-30A, HH-31A, HH-32A
Handheld Anemometer

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Unpacking Instructions

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

Vane type probe head (1)

Extension rods (one piece with handle grip) (3)

Flexible rod (1)

5 feet of connecting cable (1)
(note: the cable is attached to the 1" dia probe)

"AA" 1.5 Volt alkaline batteries (2)

Carrying case (1)

Operator's Manual (1)

If you have any questions about the shipment, please call the OMEGA Customer Service Department.

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

From the Technical Library of _____

TABLE OF CONTENTS

HH-30A, HH-31A, HH-32A Handheld Anemometer

Introduction 1

The HH-30A Series digital anemometer is a versatile instrument for measuring air velocity. Special features include switchable between Feet Per Minute (FPM) and Meters Per Second (MPS). This includes a hold/reset button so the display can be frozen to help when recording readings. Also it can indicate your average, minimum and maximum readings. This instrument is a must for anyone in the heating, ventilation and air conditioning industry. Specific applications include environmental, paint booths, air balancing and many others where air velocity measurements are essential.

2 Parts of the Anemometer

2.1 Pushbuttons

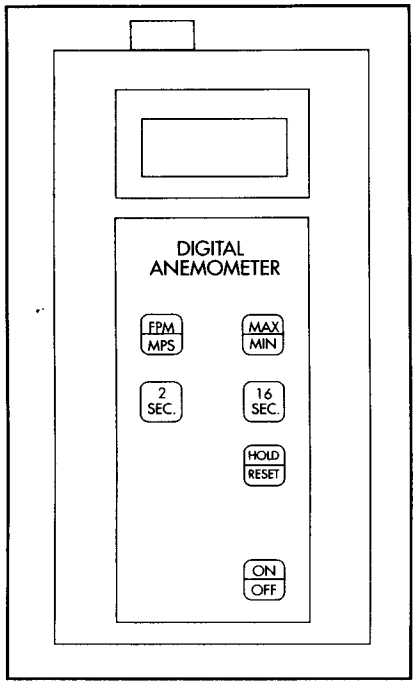

Figure 2-1. Front View of the Meter

ON/OFF — Pressing the "ON/OFF" key switches the unit ON.
Pressing the "ON/OFF" key a second time turns the unit off.

FPM/MPS — Pressing the "FPM/MPS" key displays air velocity in feet per minute with 1 FPM resolution.
Pressing "FPM/MPS" key a second time display air velocity in meters per second with 0.01 MPS resolution.

MAX/MIN — Pressing the "MAX/MIN" key will display the highest reading since turn on. The maximum hold will operate in both the "2 SEC." and "16 SEC." mode. The measuring mode is indicated by a flashing "H 2" and then the reading for the 2 second mode and a flashing "H 16" and then the reading for the 16 second mode.

MAX/MIN (Cont'd) — Pressing the "MAX/MIN" key a second time will display the lowest reading since turn on. The minimum hold will operate in both the "2 SEC." and "16 SEC." mode. The measuring mode is indicated by a flashing "L 2" and then the reading for the 2 second mode, and a flashing "L 16" and then the reading for the 16 second mode. This mode is cleared by pressing the "2 SEC." key. The maximum and minimum readings are cleared by turning the unit Off. More information on calculating the maximum and minimum is in Chapter 5.

2 SEC. — Pressing the "2 SEC." key sets the measurement period to two seconds. The LCD will display "2 SEC.". The display will then update every two seconds with average for the last two seconds.

16 SEC. — Pressing the "16 SEC." key sets the measurement period to sixteen seconds. The display will display "16 S" for the first 16 seconds, after which the display will update every two seconds with the average for the last sixteen seconds. Every time the "16 SEC." key is pressed, the averaging time will be restarted.

HOLD/RESET — Pressing the "HOLD/RESET" key will freeze (HOLD) the reading on the display (the "HOLD" symbol is displayed on the LCD). The current reading is held until reset or turn off. Pressing the "HOLD/RESET" key a second time will unfreeeze (RESET) the display (the "HOLD" symbol is not displayed on the LCD). The unit will go back into the measuring mode it was in before the "HOLD" function was initiated.

NOTE: continuing to press the "HOLD/RESET" key will cause the instrument to toggle back and forth between hold and reset.

2.2 Parts of the Display

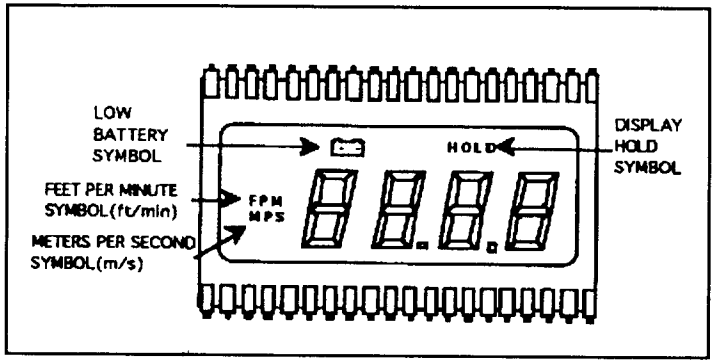

Figure 2-2. LCD Display

3.1 Installing the Batteries

1. Remove battery compartment lid by pushing the battery lid tab to the right and lifting. The battery lid should swing out of the way and off.
2. Insert 2 "AA" alkaline batteries into the battery compartment as shown in Figure 3-1.
3. Replace battery compartment lid by placing the battery hinge points into the slots and swing it shut. Make sure the unit is OFF before replacing batteries.

3.2 Installing the Probe

1. Attach the probe's connector to the instrument and/or cable by lining up the key to the keyway and inserting the connector. Rotate the locking collar. The 1" diameter probe connects directly to the instrument. The 2¾" diameter probe connects to an extension cable that in turn connects to the instrument. Refer to Figure 3-2.
2. Attach the handle to probe using extension and flex rods as needed. Make sure the unit is OFF before attaching the probe.

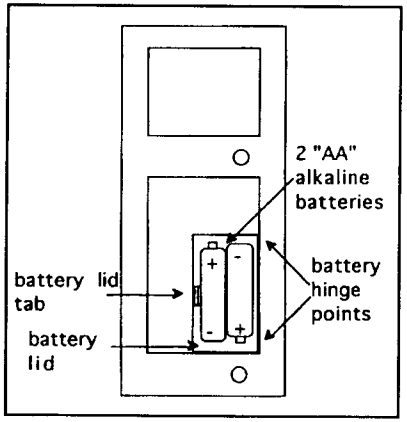

Figure 3-1. Battery Compartment

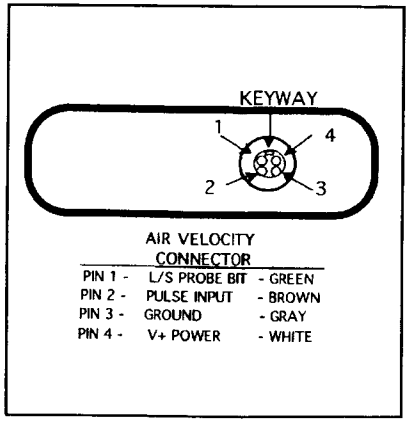

Figure 3-2. Connector Configuration

4 Operating the Anemometer

1. Press "ON/OFF" key, and the unit will turn on. The start up sequence displays information about the unit. The unit will display "8 8.8.8"; this is a display check. After display check the unit will display the battery condition ("bA85" means the battery is at 85%). After the battery condition, the unit will display which type of probe is connected (2.75 means the 2.75" diameter probe is connected, 1.00 means the 1" probe is connected). Now the startup sequence is complete and the unit starts displaying air velocity in FPM in the 2 sec average mode. When the low battery symbol appears on display, replace the batteries.

2. Now press the FPM/MPS key for desired function and place the probe head in the area where air velocity is to be measured. When using the 1" probe, line up the arrow with the direction of airflow. The 2¾" probe is bidirectional so just line up the blade's shaft to the airflow. To calculate CFM, refer to Chapter 6.

3. To get the maximum or minimum reading since tum on, press "MAX/MIN" key. Pressing the "MAX/MIN" key again causes the unit to toggle between maximum and minimum.

   The flashing "H 2" is the 2 second maximum.

   The flashing "L 2" is the 2 second minimum.

   The flashing "H 16" is the 16 second maximum.

   The flashing "L 16" is the 16 second minimum.

   To clear MAX/MIN mode, press the 2 SEC key. More information on internal instrument maximum/minimum calculations is in Chapter 5.

4. To get an average air velocity over a large area, press the "16 SEC." key and move the probe head to cover the opening to be measured After 16 seconds the unit will display the average air velocity for the last 16 sec. (updating every 2 seconds).

5. When in the 16 sec averaging mode, the maximum or minimum 16 sec reading can be displayed by pressing the "MAX/MIN" key.

6. Press ON/OFF key to turn the unit off when not in use.

Internal MAX/MIN Calculations 5

The instrument stores readings every 2 seconds. Figure 5-1 shows how the instrument takes a reading and evaluates it against the next group of readings and determines whether it is the MAX reading or the MIN reading.

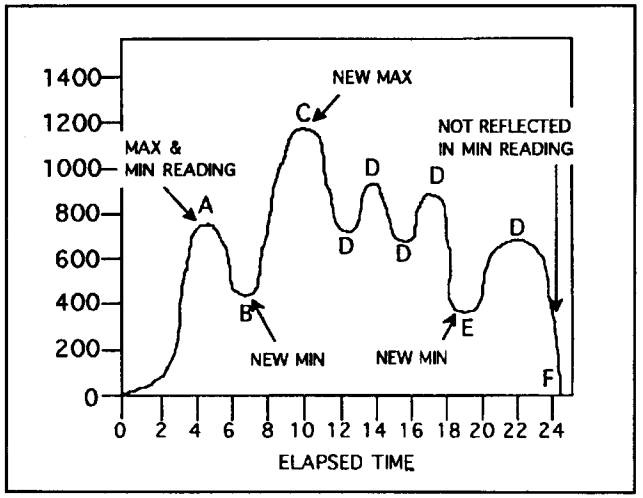

Figure 5-1. Max and Min Calculations

A First maximum reading. Also first minimum reading until B occurs.

B The new MIN will register after the air speed starts toincrease.

C The new higher MAX will register after the air speed starts to decrease.

D This speed is between the earlier MAX and MIN and will not be reflected.

E This speed is slower than the previous Min and will now be the new Min after the air speed starts to increase.

F This speed will not be reflected in the Min reading because it goes directly to zero without increasing speed in the process. This protects against false Min readings when the probe is withdrawn from the air stream.

6 Volume Airflow Calculations

To calculate cubic feet per minute (ft^3/min) CFM from a measured air velocity (ft/min) FPM, you need the cross sectional area of the flow stream.

volume flow (CFM)=airflow reading (FPM) x A {area (ft^2)}

In rectangular duct work this cross sectional area is the width times the height.

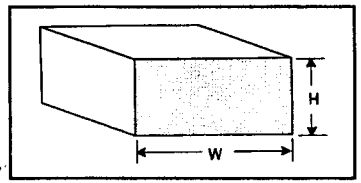

Figure 6-1. Cross Sectional Area

W x H = A (CROSS SECTIONAL AREA)

In circular duct work this cross sectional area is the radius squared times π (Pi = 3.14).

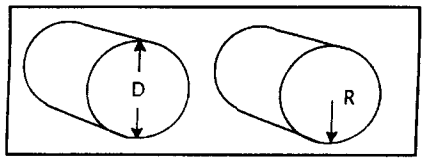

Figure 6-2. Cross Sectional Area

R x R x 3.14 = A (CROSS SECTIONAL AREA)
(D/2) x (D/2) x 3.14 = A (CROSS SECTIONAL AREA)

CONVERSION FACTORS:

To convert from square inches (in^2) to square feet (ft^2) divide by 144.

EXAMPLE

An air duct is rectangular and the width is 24" and the length is 12". The air velocity reading in the duct is 450 FPM.

W x L = A (area)
24" x 12" = 288 square inches
288 square inches ÷ 144 = 2 square feet (ft^2)

volume flow (CFM) = airflow reading (FPM) x A {area (ft^2)}
900 CFM = 450 FPM x 2 square feet (ft^2)

Specifications 7

Ranges

HH-30A:	40 to 7800 FPM (0.2 to 40.00 MPS)
HH-31A:	60 to 6800 FPM (0.3 to 35.00 MPS)
HH-32A:	combines both probes for both ranges

Accuracy

Air Velocity:

2¾" Probe :	±0.25% FS, ± 0.75% of reading ± 1 digit
1" Probe:	±0.5% FS, ± 1.0% of reading ± 1 digit

Resolution: 1 FPM or 0.01 MPS

Display: 0.5" LCD, 4 digits

Operating Temperature: 32°F to 125°F (instrument)
-4°F to 210°F (probe heads)

Power Supply: 2 AA alkaline batteries

Battery Life: Approximately 300 hours

Battery Check: Automatic low battery display, battery capacity readout at startup

Dimensions:

Instrument:	7.1" x 3.0" x 0.8" (178 x 76 x 20 mm)
HH-30A Probe:	2¾" diameter
HH-31A Probe:	1" diameter

Weight: 8 ounces (227g) with batteries

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 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 should malfunction, 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 being 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 which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

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

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