



Model DA40V



User Manual

Warranty

This product is fully warranted against defective materials and/or workmanship for a period of one year after purchase, provided it was not improperly used. For your protection, please use this product as soon as possible. If returned, it must be securely wrapped, sent prepaid and insured to:

Pacer Industries, Inc.
1450 First Avenue
Chippewa Falls, WI 54729
PH: 715-723-1141
FX: 715-723-7890

Please include a note with name, address, telephone number and description of the problem. Although we provide assistance on Pacer products both personally and through our literature, it is still the total responsibility of the customer to determine the suitability of the product for use in their application.

This manual is provided by Pacer Industries without any kind of warranty. Precautions have been taken in accurately preparing this manual; however, we neither assume responsibility for any omissions or errors that may appear nor assume liability for any damages that result from the use of the products in accordance with the information contained in the manual.

INTRODUCTION

Pacer's model DA40V digital anemometer is a versatile instrument for measuring air velocity and volume-flow rate from HVAC ducts or process airflow.

The heavy, all metal (except electronics) probe 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, tolerance of temperatures up to 210°F (98.9°C) at the probe, and durability.

SECTION 1 - SPECIFICATIONS

Range:

Velocity: AP275 probe: 40 - 7800 FPM (0.2 - 40.0 MPS)
AP100 probe: 60 - 6800 FPM (0.3 - 35.0 MPS)
Volume flow rate: 0.0 - 9999 ft³/min (CFM) or
0.0 - 9999 m³/hr (CMH)

Accuracy: ±1.0% of reading ±1 digit

Resolution: 1 FPM or 0.01 MPS

Operating Temperature:

Instrument: 32 to 125°F (0 to 50°C)
Probes: -4° to 210°F (-20° to 98.9°C)

Power Supply: 2 AA alkaline batteries, E91 Eveready or equivalent

Battery Life: Approximately 300 hours

Battery check: Automatic low battery display

Dimensions:

Instrument: 7.1" x 3.0" x 0.8"
AP275 probe: 2 ¾" diameter
AP100 probe: 1" diameter

Weight: 8 ounces with batteries

Display: 0.5" LCD, 4 digits

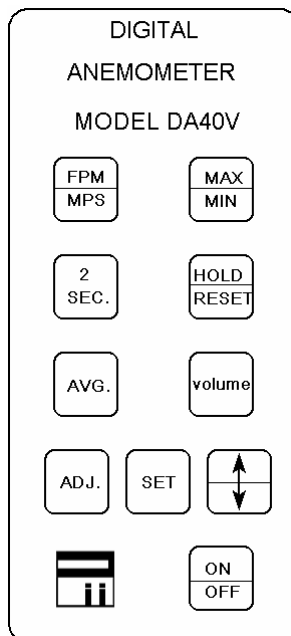
Options:

Model CG-4 charger: PN 3303 (with 4 NiMH batteries)
Additional probe: AP100 (1") or AP275 (2 ¾")
Cable longer than 5': PN 3834, specify length
Extra extension rod: PN 5001 rigid, PN 5002 flexible

Included:

1 piece: Probe, choice of AP100 or AP275
3 pieces: PN 5001 rigid extension rod
1 piece: PN 5002 flexible extension rod
1 piece: PN 3834 5 ft. connection cable
2 pieces: AA 1.5V alkaline batteries
1 piece: PN 6004 hard-shell carrying case
1 piece: M2945 operation manual

SECTION 2 – SWITCH FUNCTIONS



- ON/OFF** Pressing “ON/OFF” key switches unit ON. Pressing the key a second time turns it OFF.
- FPM/MPS** Pressing “FPM/MPS” key toggles unit from FPM (1 FPM resolution) to MPS (0.01 MPS resolution).
- 2 SEC.** Pressing “2 SEC.” key sets measurement period to two seconds. The display will show “2 SEC.”, then a measurement value. It will update every two seconds with average of the preceding two seconds.
- AVG.** Pressing “AVG.” key sets the measurement period to sixteen seconds. The display will show “16 S” for 16 sec., then a measurement value. It will update every two seconds with average of the preceding sixteen seconds.
- MAX/MIN** Pressing “MAX/MIN” key within either velocity or volume-flow mode displays the highest reading, respectively, since turn-on. A second key-press will display lowest reading since turn-on. In “2 SEC.” mode display reads “H 2” (“L 2”) followed by reading. In “16 SEC.” mode display reads “H 16” (“L 16”) followed by reading. See APPENDIX A for description of algorithm that determines MAX and MIN. Clear internal memory by turning unit OFF. Clear the “MAX/MIN” mode by pressing any other key (except “HOLD”).
- HOLD/RESET** Pressing “HOLD/RESET” key will freeze the reading on the display; “HOLD” is displayed and the reading is held. Pressing “HOLD/RESET” key a second time frees the display.

VOLUME Pressing “VOLUME” key will cause “E-20” to be displayed unless duct size has been entered since “ON/OFF” key was last pressed (see SET below). Once duct size has been entered, the unit will enter volume-flow mode upon the first key-press; upon second and subsequent key-presses, volume-flow units will toggle between CFM and CMH. “E-21” displays upon an overflow, see APPENDIX F.

SET Pressing “SET” key locks-in choices presented by “ADJ” key actuation and advances menu to next decision needed. In order, you must choose:

A. UNITS
After “SET” key is pressed for the first time, “Unit” is displayed. Choose “inCH” or “CEnt” for inches or centimeters respectively. Press “SET”.

B. DUCT SHAPE
Choose “rECt” or “CirC” for rectangular or circular ducts respectively. Press “SET”.

C. DUCT SIZE
For rectangular ducts:
Display will read “HEit” after B above. Press “ADJ” key until first digit of height shows. Press “SET”. Repeat for next three digits. Display will now read “Len”. Enter four digits of length. Display will show “2 SEC” and volume-flow will now display.
For circular ducts:
Display will read “diA” after B above. Enter four digits of the diameter as above.

↑/↓ **KEY** The direction key changes the order of numbers being displayed in C above; choosing backwards or forwards enumeration.

SECTION 3 – OPERATION

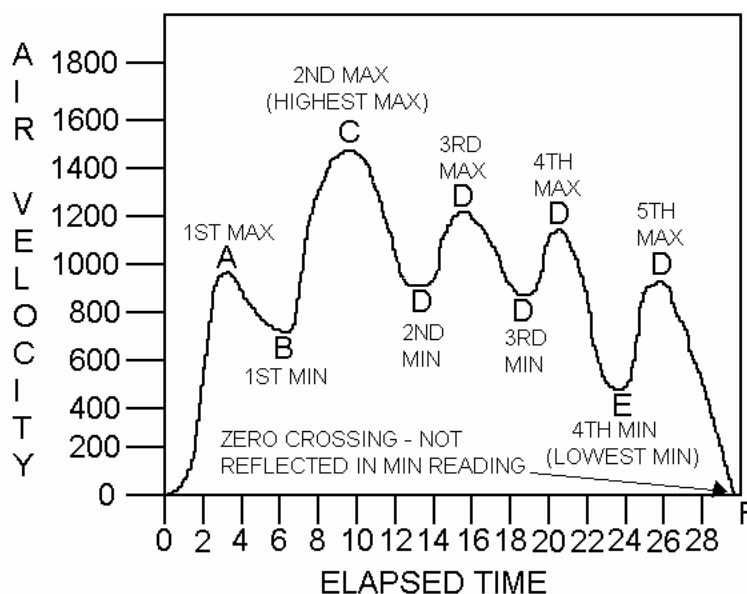
NOTE: Unit should be “OFF” before changing batteries or attaching probe.

- 1) Remove battery compartment lid and insert batteries; replace lid (see APPENDIX D).
- 2) Attach the probe cable by aligning the keyway(s), inserting connector(s) and turning collar(s) to tighten (see APPENDIX B for connector wiring diagram).
- 3) Press the “ON/OFF” key to turn unit ON. The display will show all its elements (see APPENDIX C) followed by the remaining battery capacity (“bA85” means the battery is at 85% capacity) followed by “2.75” or “1.00” indicating the AP275 or AP100 probe, respectively, is attached. When the battery symbol appears during use, replace batteries.
- 4) Press “FPM/MPS” key, if necessary, to display desired units. Place probe in the air stream with direction arrow (if present) in the direction of the airflow.
- 5) To calculate CFM manually see APPENDIX E. To measure volume-flow rate directly press the “VOLUME” key and follow instructions in SECTION 2 – VOLUME above.

NOTE: When symbols “CUBIC” and “MPS” are displayed, measurement is CMH – not CMS.

- 6) To correctly measure the air velocity or volume-flow rate from a large duct, set unit to “AVG.” mode and move probe about the area of the opening. After 16 seconds, the unit will display the average for the preceding 16 seconds, after that updating every 2 seconds by adding the latest and dropping the oldest 2 second measurement.
- 7) To get maximum readings since turn-on, press “MAX/MIN” key; to get minimum readings, press “MAX/MIN” key a second time. For explanation of the displayed views, see “MAX/MIN” paragraph in SECTION 2, also APPENDIX A.
- 8) To HOLD the displayed reading, press the “HOLD/RESET” key. Press key again to clear the HOLD condition.

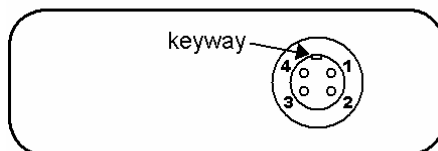
APPENDIX A – MAX/MIN CALCULATIONS



- A) 1st MAX reading. Also first minimum reading, to be replaced at B.
- B) This 1st MIN at B is the lowest yet and will be registered as velocity increases.
- C) This 2nd, higher MAX at C will register as the velocity decreases, replacing 1st MAX.
- D) This 2nd MIN at D is higher than the MIN already registered and will be ignored.
- E) This 4th MIN at E is lower than the 1st MIN, registered at B, and will replace it.
- F) The zero crossing at F does not form a MIN and will be ignored. This protects against false MIN readings when the probe is withdrawn from the air stream.

APPENDIX B – CONNECTOR DIAGRAM

Connector Pinout/Wire Code
(top view)

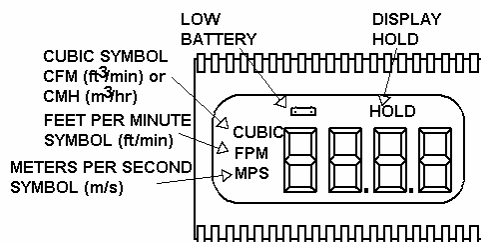


Air Velocity Connector

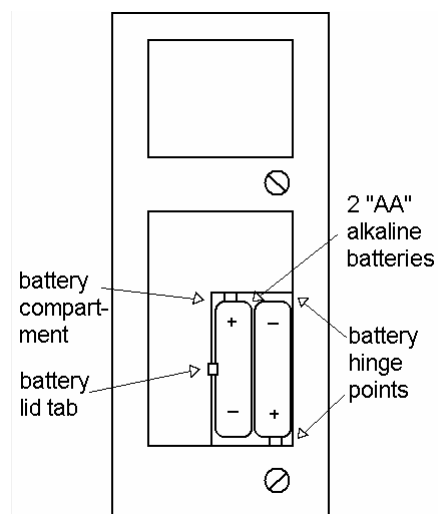
| | |
|-----------------------------|-----|
| Pin 1 Large/Small Probe Bit | Grn |
| Pin 2 Velocity Input Pulse | Brn |
| Pin 3 Ground | Gry |
| Pin 4 V+ (power) | Wht |

APPENDIX C – LCD DISPLAY SYMBOLS

LCD DISPLAY



APPENDIX D – CHANGING BATTERIES

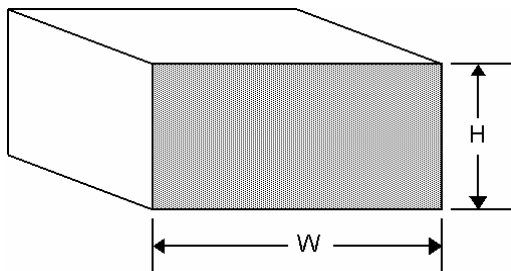


APPENDIX E – AIRFLOW VOLUME CALCULATIONS

Theory: 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:

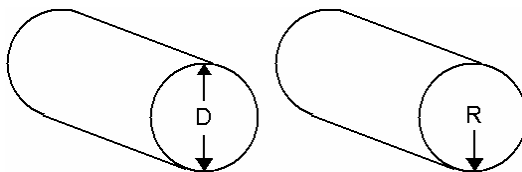
Volume Flow (CFM) = Velocity (FPM) X Area (sq ft).

In rectangular duct work this cross sectional area equals the Width times the Height.



$W \times H = A$ (cross-sectional area)

In circular ductwork this cross section area equals the radius squared times π (3.14).



$R \times R \times 3.14 = A$ (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 F – ERROR CODES

E-20 The volume factor is undefined (duct dimensions have not been entered since turn-on).

E-21 The calculated volume flow rate is not within the 9999 CFM or CMH range of the display.

Notes: