

OWNER'S MANUAL

Model RVD Rotating Vane Anemometer



ALNOR[®]

TSI Incorporated

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Knowing that inoperative or defective instruments are as detrimental to TSI as they are to our customers, our service policy is designed to give prompt attention to any problems. If any malfunction is discovered, please contact your nearest sales office or representative, or call Customer Service at (800) 424-7427 (USA) and (1) 651-490-2811 (International).

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CHAPTER 1

Unpacking and Parts Identification

Carefully unpack the instrument and accessories from the shipping container. Check the individual parts against the list of components in Table 1-1. If any are missing or damaged, notify TSI or your local distributor immediately.

Table 1-1: List of Components

Qty	Item Description	Part/Model
1	RVD (meter alone)	534-150-222
1	Carrying Case	534-150-600
1	100mm Head	634-150-221
1	Handle	534-593-173
4	AA Alkaline Batteries	459-000-003
1	Operation and Service Manual	116-159-220
1	Calibration Certificate	
1	Computer Interface Cable, Downloading Software	634-858-386
1	Telescopic Extension w/Articulating Knuckle	634-150-223
1	Optional AC Adapter 115 V, NEMA-5 230 V, European CEE 7/16 230 V, Great Britain 240 V, Australian	002-613-033 002-613-078 000-800-169 002-613-106
1	Optional Small Head	634-250-035
1	Optional 8522 Portable Printer	638-852-200

Parts Identification

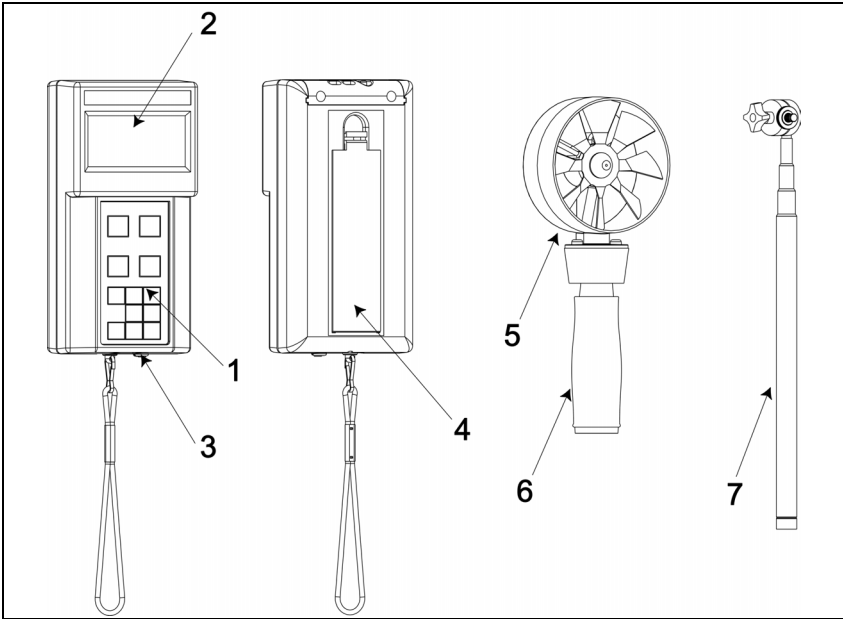


Figure 1-1: RVD and Accessories

1. Keypad
2. Display
3. Printer Output/ Communications Port
4. Battery Access Cover
5. Rotating Vane Head
6. Rotating Vane Handle
7. Articulating Extension

CHAPTER 2

Setting-Up

Supplying Power to the RVD

The RVD can be powered in one of two ways: four size AA batteries or the optional AC adapter.

Installing the Batteries

Insert four AA batteries as indicated by the diagram located on the inside of the battery compartment. TSI ships the unit with alkaline batteries. The RVD is designed to operate with either alkaline or NiCd rechargeable batteries. Carbon-zinc batteries are not recommended because of the danger of battery leakage. Typical battery life for alkaline batteries at 20°C is 24 hours. At 15% battery life remaining, the battery icon will indicate the batteries need to be changed. At this point, you have about 2 hours of useful battery life remaining.

Using the Optional AC Adapter

The optional AC adapter allows you to power the RVD from a wall outlet. When using the AC adapter, the batteries (if installed) will be bypassed. The AC adapter is not a battery charger.

Auto Power Off Feature

The RVD's auto power off feature will automatically power the instrument off after a specified time if no measurements are being taken. In velocity mode, the instrument will power off after 15 minutes provided that the velocity is zero and no keys have been pressed during this time. In temperature mode, the instrument will power off after 15 minutes if no keys have been pressed. No samples stored in memory will be lost when the meter is automatically powered off.

This feature can be turned off if desired by switching DIP switch #2 to the ON position. See Appendix A for DIP Switch Settings.

Selecting the Display Units

The RVD is capable of displaying the measured values in several different measurement units, as shown in Table 2-1.

Table 2-1: Choices of Measurement Units

Velocity	Temperature	Flow Rate
ft/min	°F	ft ³ /min
m/s	°C	m ³ /h
		l/s

If you wish to change the display units on your RVD, see Appendix A.

The Rotating Vane Head

The rotating vane head of the RVD contains the velocity and temperature sensors along with stored calibration data. When using the rotating vane head, make sure the blades are free to move and the flow arrow points along the air flow path.

WARNING! Be sure to turn the meter off before connecting or disconnecting rotating vane heads. Do not expose the vane head to excessive heat; it can damage the vane head.
--

Attaching the Handle

To attach the handle, screw the handle into the bottom of the rotating vane head until secure.

Using the Articulating Extension

The articulating extension allows you to secure the vane head at nearly any angle. Once you have attached the articulating extension to the vane head and handle, you can then unscrew the angle adjustment bolt and adjust the angle of the elbow. You can also adjust the rotation of the head by partially unscrewing the head from the handle and tightening it with the knurled knob, located underneath the vane head.

Using the Optional Small Vane Head

The smaller optional rotating vane head is primarily intended for tests with constricted flow area or those difficult to reach. The small rotating vane head functions like the large vane head. With the unit turned off, unplug the large head from the instrument and plug in the small head and then turn the unit on again.

Start Up Sequence

When the instrument is first turned on it goes through a preprogrammed power-up sequence that includes an internal self-check which illuminates all the LCD segments. The RVD will then display percentage of battery life remaining (accurate for alkaline batteries only), baud rate, percentage of memory log remaining, time, time constant value, and current test ID. At this point, the RVD will start measuring in velocity mode.

Changing the Baud Rate

The RVD has a variable baud rate that is used when downloading or printing data from the instrument. By increasing the baud rate, the data will download faster.

The instrument baud rate is displayed during the initial power up sequence. To change the baud rate, press and hold the ▲ or ▼ key during power-up sequence while baud rate is displayed. Release the key when the RVD beeps twice. Use ▲ or ▼ keys to scroll through the available values of 1200, 2400, 4800, 9600 and 19200. Press ENTER key to accept your choice.

Setting the Real-Time Clock

The RVD has an internal clock that keeps track of the time (the format is HH.MM where HH is the hour in 24-hour format, and MM is minutes) and the date. It is very important to set the time and date correctly, otherwise, date and time stamping of recorded data will not be correct.

To set the time and date, press and hold the ▲ or ▼ key during the power-up sequence when the time is displayed. Release the key when the RVD beeps twice. You can now view and/or change the hours, minutes, year, month and day in sequence. Use ▲ or ▼ key to change any settings. Use the ENTER key to store each setting and advance to the next one.

Time Constant

The time constant is an averaging period. The RVD display is updated every second. However, the reading displayed is the average reading over the last time constant period. For example, if the current time constant is set to 10 seconds, the display will show readings averaged over the previous 10 seconds, updated every second. This is also called a 10 second “moving average” when in normal display mode.

CHAPTER 3

Operation

Keypad Functions

When pressing the keys on the front panel, the RVD will beep to confirm the function. If you press a key and the RVD does not beep, then the RVD does not allow that function during the current mode.

The RVD has the ability to data log, determine statistics and recall individual data points. When the **READ** key is pressed, the samples being taken are added to the memory. The **RECALL** key is used to view statistics or individual sample points. The **NEXT TEST** key is used to advance to the next test ID number. The RVD retains data even when it is turned off.

ON/OFF Key

Press the **ON/OFF** key to turn the RVD on and off. When the instrument is first turned on it goes through a preprogrammed power-up sequence that includes an internal self-check which illuminates all the LCD segments. The RVD will then display percentage of battery life remaining (accurate for alkaline batteries only), baud rate, percentage of memory log remaining, time, time constant value, and current test ID. At this point, the RVD will start measuring in velocity mode.

***Note:** To skip the start-up displays, press **ENTER** at any time during the power-up sequence.*

Arrow Keys (▲▼)

The two arrow keys are used to scroll through and select values as needed for RVD functions. Pressing and holding either arrow key during the start-up sequence will allow you to change the baud rate, time and date, and time constant value.

ENTER Key

Press the **ENTER** key to accept a value or condition. In start-up mode, you can also press the **ENTER** key to skip the start-up sequence.

VEL Key

Press the **VEL** key to display velocity measurements. The velocity will be displayed in ft/min or m/s depending on the DIP switch settings (refer to Appendix A). The RVD will automatically start in velocity mode.

TEMP Key

Press the TEMP key to display air temperature readings. The RVD will display temperature readings in either degrees Fahrenheit (°F), or degrees Celsius (°C) depending on the DIP switch settings (refer to Appendix A).

VOL Key

The RVD can calculate air volume using a known area. The RVD displays the volumetric flow in ft³/min, m³/h, or l/s, depending on the DIP switch setting (refer to Appendix A). The RVD calculates the volume flow rate for round, square or rectangular flow areas. Once initially entered, the shape and size of the flow area will be retained from the last entered value.

Entering Shape and Size

Press the VOL key to put the RVD in volume mode. If this is the first time the flowrate function is being used, you will be prompted to enter the shape and size.

Press ▲ or ▼ key; the display will flash between the round and square icons. Press ▲ or ▼ key again to select the shape of the area, rectangular (square) or circular, being measured. Each time ▲ or ▼ key is pressed, the display will toggle between the circle and rectangle. When the desired shape appears on the display press the ENTER key. This will enter the shape and the RVD will then ask for the size.

Use ▲ or ▼ key to select the size of the air flow area. For a circular flow shape, the RVD will ask for one size, the diameter of the circular area. Select the size and press the ENTER key to accept it. For a rectangular area the RVD will ask for two dimensions. First select the X dimension and press the ENTER key, then select the Y dimension and press the ENTER key.

To change the shape or dimensions after they have been entered, press ▲ or ▼ key. Proceed as above to enter the shape and dimensions.

READ Key

This key has four functions: takes an individual reading and stores it into memory, is used during sweep mode, initiates the datalogging function when in log mode, and interrupts the datalogging function anytime during the datalogging process (see TIME LOG section for more details).

Single Point Storage to Memory

Press and release the READ key to start the sample. The display will flash “SAMPLE” for the duration of the TIME CONSTANT interval along with a sample number. Then the sampled value will be displayed. Temperature, velocity and volume values will be taken and saved into memory.

Sweep Mode

This is a way to temporarily bypass the time constant to produce an average during the entire time the READ key is pressed. Press and hold the READ key to start the sample. If the READ key is not released within one second, the instrument is in sweep mode. The display will flash “sample” while you are sampling. The instrument will continue sampling until the READ key is released, and then the average value and units of measure will be displayed once the sample is taken. To separate data obtained by “sweep,” use different test numbers.

***Note:** If the word “LOG” appears, you are in continuous logging mode, and cannot use sweep mode.*

DEL Key

To delete the last recorded value, press and hold the DEL key. A count down from 3 to 0 will start. Release the key anytime **before** 0 is shown.

***Note:** Only the last sample recorded can be cleared without clearing the entire memory.*

To clear all samples in the sample buffer, press and hold the DEL key. A count down from 3 to 0 will start, **while 0 is displayed**, release the DEL key.

***Note:** No samples will be cleared if the DEL key is released after 0 is displayed.*

NEXT TEST Key

Press NEXT TEST to advance to the next test number. If the current test number does not have anything stored, it will not advance to the next test number. All readings are stored in test numbers. You may store up to 999 samples in 285 separate test numbers.

The RVD will automatically increment the test ID number under the following conditions:

- turning off the RVD (if there is stored data)
- taking a sample with a different duct size or shape than the last stored sample
- taking a continuous data logging sample
- taking discrete samples after taking a continuous sample

TIME LOG Key

This key serves two purposes: to perform continuous data storage (datalogging) or to change the time constant value.

Continuous Data Storage (Datalogging)

This option will allow automatic storage of data over a period of time. All readings are stored in test ID numbers. You may store up to 999 samples in 285 test IDs.

To set up the datalog feature:

Press the TIME LOG key. Use the ▲ or ▼ arrow keys to select “ON”. Press the ENTER key to accept your choice. “LOG” will light up on the display and the logging interval is shown. Use the ▲ or ▼ arrow keys to scroll through the log interval choices. The choices are: 1–10, 15, 20, 25, and 30 seconds, and 1–10, 15, 20, 25, 30, and 60 minutes. Press the ENTER key to accept your choice.

Next, you will choose the number of samples. The choices are “CONT” or 1 to 999. Use the ▲ or ▼ arrow keys to scroll through the choices, and press ENTER to accept your choice. The instrument will then return to measuring mode.

If “CONT” is chosen, the instrument will sample continuously until it is either stopped manually, runs out of memory, or the batteries run out. If a number between 1 and 999 is chosen, the instrument will take that number of samples and then stop storing readings.

To start the logging, press the READ key. Pressing READ again will stop the datalogging currently in process.

The log mode remains “ON” until you go into TIME LOG and turn this feature “OFF.” This was done so you can use continuous datalogging in various locations without resetting the TIME LOG. When “LOG” is on the display, pressing READ starts the TIME LOG operation.

To Change Time Constant Value

The time constant is an averaging period. The RVD display is updated every second. However, the reading displayed is the average reading over the last time constant period. For example, if the current time constant is set to 10 seconds, the display will show readings averaged over the previous 10 seconds, updated every second. This is also called a 10 second “moving average” when in normal display mode.

Changing Time Constant Value

To change the time constant value, press and hold the TIME LOG key until the RVD beeps. The display will show the current time constant value. The available choices are 1–10, 15, 20, 25, and 30 seconds. Use ▲ or ▼ key to change any settings. Use the ENTER key to accept your choice.

RECALL Key

The RECALL key has two purposes. One is to view the statistics for the current test ID number, and the other is to review data for a particular test ID, including individual sample values.

To View Statistics On Current Test ID Number

Press and release RECALL key. The RVD will beep three times. The display will show the current test ID. Press ENTER key to view average, press ▲ to scroll through maximum, minimum, number of samples taken, and then the individual values. Press ▼ key to scroll back. Press ENTER to return to run mode.

To Review Data Stored in Memory

Press and release RECALL key. The RVD will beep three times. Use the ▲ or ▼ key to select the desired test ID. Press ENTER to accept the test ID number. Use ▲ or ▼ key to view average, maximum, minimum, total number of samples, and individual sample values for the selected test ID. The samples will be displayed in the order that they were taken, press ENTER to return to run mode.

To view a different test ID, press RECALL again to return to test ID selection. To review data of a different measurement type, press the desired measurement type button (VEL, VOL, TEMP) while AVG, MAX, MIN, number of samples, or individual sample is being displayed. If there is no data for that measurement type, “-----” will be displayed. Press another measurement type key to view more data or press ENTER to return to measuring mode.

Serial Communications

Connecting the Optional Model 8522 Portable Printer

To connect the Model 8522 printer to the RVD, locate the Printer Interface Cable supplied with the optional printer, and connect the 9-pin end labeled “PRINTER” to the printer and the other end to the data port of the RVD. The printer must be set to the same baud rate as the RVD. See *Baud Rate* section for details on how to change the baud rate. To change the baud rate of the printer, please refer to the operation and service manual for the printer to properly set the printer’s DIP switch settings. If the printer prints question marks (?????), asterisks (*****), or random characters, reset it by turning it off and then on again. If necessary, refer to the *Model 8522 Portable Printer Operation and Service Manual*.

Printing Data Using the 8522 Portable Printer

Printer should be set with bit length 8, one stop bit, and no parity. To print all data in memory, press and hold the RECALL key to start a countdown

from 3 to 0. When 0 is on the display, release the key. If the key is released at any other time, nothing will be printed.

To print only a selected test ID, press the **RECALL** key to show the test ID number. Using the **▲** or **▼** keys, select the desired test ID that you would like to print. Then press and hold the **RECALL** key until the display counts down to zero. The selected test ID will then print, including the statistics for all measurement parameters stored as well as the data points for only the parameter displayed on the large digits.

If the printer is connected to the instrument while taking readings, each time the **ENTER** key is pressed, the reading(s) will be printed to the portable printer. Also, each time a parameter is changed (type of flowrate, time constant, etc.), the new setting will also be printed.

In flowrate mode, shape and size data is also transmitted when it is entered or changed. The value of the time constant is transmitted when it is changed. In logging mode, it prints the same as if you are pressing **READ** every logging interval.

Note: *In order to print, the baud rate on the RVD must be set to the same as the printer. The default is 1200.*

The data will print in a format such as 12345.67. If you desire, the RVD can print in a format such as 12345,67 by switching DIP switch #4 ON. See Appendix A for DIP Switch Settings.

Connecting to a Computer

Use the Computer Interface Cable provided with the RVD to connect the instrument to a computer for remote polling or for downloading stored data. Connect the 9-pin end labeled “COMPUTER” to the computer COM port and the other end to the data port of the RVD. A 9-pin to 25-pin adapter will be required if your computer has a 25-pin serial port connector.

For more information on how to download stored data see section on *Downloading Data to a Computer*. For polling instructions, see the *Data Acquisition (Polling)* section.



Caution: The data port of the RVD is not intended for connection to a public telecommunications network. Connect the data port only to another RS232 port.

Downloading Data to A Computer

“COMPUDAT” is a windows-based program from TSI designed to download the data stored in the memory of the RVD to a computer. This data includes the test ID, measurement, unit of measure, flow area, and time constant. This data is date and time stamped. In addition, the statistics for each test ID are provided. The file containing the downloaded data is sorted and tab delimited to allow it to be imported into a spreadsheet for further data analysis.

To load COMPUDAT on your computer, use the following procedure, also found on the disk:

- For Windows 3.1: Select File, Run, and type “A:\setup.exe”
- For Windows 95/98: Select Start, Run, and type “A:\setup.exe”

Once you open the program, it is self-directing and provides all the necessary instructions for downloading data.

To download data from the RVD, connect the supplied computer interface cable to the RVD and to a computer serial port. Any serial port from COM1 to COM4 can be used.

Data Acquisition (Polling)

The RVD is designed to allow you to perform polling through the use of a computer. To do this, your computer must be connected and in Terminal mode. The baud rate for the computer and the RVD must be set to the same value. For details on viewing or changing the baud rate, see *Changing the Baud Rate* section in Chapter 2. You must then send an upper case V to the instrument.

You must write your own routine (program) to obtain information at specific intervals from the RVD. The meter will only send information when the READ key is pressed or after the computer has sent a “V” command to the RVD.

CHAPTER 4

Maintenance

Rotating Vane Head

Periodically inspect the rotating vane head to ensure that it is clean. Dust and oil deposits on the temperature sensor or rotating blades decrease the accuracy of the RVD.

Caution: The RVD must be switched off for cleaning. Do **not** use high-pressure air or strong solvents to clean the sensor head; damage to the blades or temperature sensor could result.

To remove dust, blow it off with a gentle stream of air. To remove a combination of dust and oil, carefully wipe the blades and blade shield using a cotton swab soaked with isopropyl alcohol and then blow it off with a gentle stream of air. Be careful not to bend or deform the blades in any manner.

Recalibration

To maintain a high degree of accuracy in your measurements, TSI recommends that you return your instrument for annual recalibration. For a nominal fee, we will recalibrate the unit and return it to you with a certificate of traceable to NIST. This “annual checkup” assures you of consistently accurate readings; it is especially important in applications where strict calibration records must be maintained.

Cases

If the instrument case or storage case needs cleaning, wipe it off with a soft cloth and isopropyl alcohol or a mild detergent. Never submerge the RVD.

Storage

When storing the RVD for more than a month, it is recommended to remove the batteries. This prevents damage due to battery leakage.

CHAPTER 5

Troubleshooting

Table 5-1 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the RVD. If your symptom is not listed, or if none of the corrective actions solve your problem, please contact Customer Service.

Table 5-1: Troubleshooting the RVD

Symptom	Possible Causes	Corrective Action
No display	Unit not switched on	Switch on the unit.
	Low or dead batteries	Replace the batteries or plug in the AC adapter.
	Dirty battery contacts	Clean the battery contacts.
Battery symbol is blinking	Batteries are low, 15% or less life remaining	Replace or recharge batteries.
Display reads "LO"	Wrong AC adapter	Replace with the correct AC adapter.
	Low AC line voltage	Correct the AC line voltage or use batteries.
	Dirty battery contacts	Clean the battery contacts.
Display reads "SER1-SER7"	The RVD has detected an internal fault	Return to factory for service.
Display reads "OVER"	The velocity or temperature is too high	Use an alternate method to make measurement.
Temp. initially reads high or low	Temperature sensor is still adjusting to temperature	Allow sufficient time for the temperature to stabilize.
Display reads "ERR"	You are trying to enter more readings than memory can handle	Read or record the average; clear the sample register and proceed.
Velocity reading fluctuates badly	The flow is fluctuating	Reposition the probe in a less turbulent section of the flow or use a longer time constant.
Display reads "Lbat"	Low lithium battery power	Return to TSI for replacement.
Display reads "rA _{nn} "	Datalogging RAM is inoperable	Return to TSI for service.
" - - - - "	No vane head connected or detected by meter.	Connect vane head to meter and turn on. If problem persists with head attached, return to TSI for service.

APPENDIX A

DIP Switch Settings

To access the DIP switches, remove the batteries from the battery compartment. On the inside of the battery compartment, there is a window with eight DIP switches. The table below shows the functions for each switch.

Caution: Make certain that power is turned off before changing DIP switch settings.
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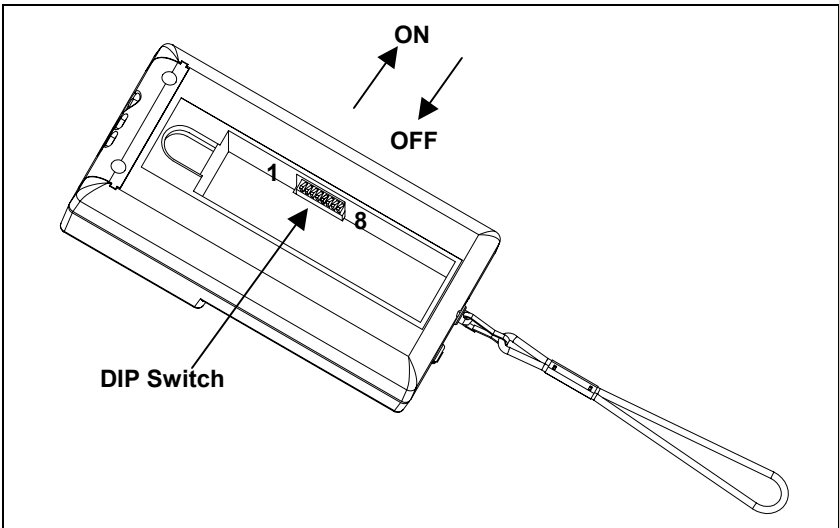


Figure A-1: DIP Switch Location

Table A-1: DIP Switch Settings

Switch	Function	Settings
1	Temperature Scale	OFF: Fahrenheit (°F) ON: Celsius (°C)
2	Auto Shut-off	OFF: enabled ON: disabled
3, 4	Velocity/Volume Units of measure selection	3 ON, 4 OFF: m/s, l/s (#1 is ON)* 3 ON, 4 ON: m/s, m ³ /min 3 OFF, 4 OFF: ft/min, ft ³ /min 3 OFF, 4 ON: m/s, m ³ /h (#1 is ON)*
5	User calibration adjustment (temp.) <i>See Appendix B</i>	OFF: Normal ON: User calibration adjust mode (switch #7 must be ON)
6	User calibration adjustment (velocity) <i>See Appendix B</i>	OFF: Normal ON: User calibration adjust mode (switch #7 must be ON)
7	User Calibration adjustment	OFF: Normal ON: User calibration adjust mode
8	Format (1 _x 23)	OFF: MM/DD/YY; periods as dec. point ON: DD/MM/YY; commas as dec. point

The ON position is away from the batteries and OFF is towards the batteries. Always leave DIP switch #5, 6 and 7 in the OFF position when in normal operation mode.

*To select metric volume units (l/s or m³/h), DIP switch #1 must be ON.

APPENDIX B

Field Calibration Adjustments

The Alnor Rotating Vane Anemometer Model RVD has field adjustment capability. This allows you to override the velocity and/or temperature calibrations of the instrument if necessary. These adjustments will be saved in the instrument's calibration EEPROM. This change is permanent until it is changed again. By changing these corrections back to 0.00, you can return to the original factory calibration settings.

These field adjustments are intended to make minor changes in calibration to match your calibration standards. These are simple linear multipliers or offset adjustments, and they do **not** permit multiple-point calibrations. This field adjustment is **not** intended as a complete calibration capability. For complete, multiple-point calibration and certification, the instrument must be returned to the factory.

***Note:** It is recommended to note down adjustment factors and offsets for tests which were performed with altered calibration so they can be identified later when test data is retrieved or printed from instrument's memory.*

Field Calibration Procedure

1. Velocity Calibration Adjust

Turn the instrument power off and remove batteries to gain access to DIP switches. Set DIP switches 7 and 6 to ON position. Replace batteries and turn the instrument on. The instrument is in the Velocity Calibration Adjust Mode and will display 0.0 (or any previously set value), units of measure and % sign. Use the ▲ or ▼ keys to set the display to a desired value and press ENTER key. The instrument will display dOnE. At this point turn the instrument off, remove batteries and reset DIP switches 6 and 7 to OFF position. Replace batteries and the battery cover. Turn the instrument on. During the start-up routine the display will show briefly the selected adjustment factor (the instrument does not display the adjustment factor if it is set to 0.0). This adjustment factor multiplies all velocity readings by the same percentage value. The adjustment range is $\pm 12\%$.

To return to the original factory calibration settings, set the percentage adjustment factor to 0.0% following the steps described above.

2. Temperature Calibration Adjust

The temperature calibration adjustment adds or subtracts a constant number of degrees Fahrenheit (°F) or degrees Celsius (°C) from the displayed reading. The adjustment range is $\pm 10.0^{\circ}\text{F}$ or $\pm 5.5^{\circ}\text{C}$. Temperature calibration adjustments can be done in either the °F or °C scale depending on temperature scale selected.

Turn the instrument power off and remove batteries to gain access to DIP switches. Set DIP switches 7 and 5 to ON position. Replace batteries and turn the instrument on. The instrument is in the Temperature Calibration Adjust Mode and will display 0.0 (or any previously set value) and the temperature scale (°F or °C). Using ▲ or ▼ keys set the display to a desired offset value and press ENTER key. The instrument will display dOnE. At this point turn the instrument off, remove batteries and reset DIP switches 5 and 7 to OFF position. Replace batteries and the battery cover. Turn the instrument on. During the start-up routine the display will show briefly the newly selected temperature adjustment offset (the instrument does not display the offset value if it is set to 0.0).

To return to the original factory calibration settings, set the percentage adjustment factor to 0.0% following the steps described above.

SPECIFICATIONS

Specifications are subject to change without notice.

Specifications in parentheses () indicate metric equivalents.

VELOCITY:

Range (large head): 50 to 6,000 ft/min (0.25 to 30 m/s)

Accuracy (large head): $\pm 1.0\%$ of reading or ± 3 ft/min (± 0.015 m/s), whichever is greater

Range (small head): 80 to 6,000 ft/min (0.4 to 30 m/s)

Accuracy (small head): $\pm 1.5\%$ of reading or ± 5 ft/min (± 0.025 m/s), whichever is greater

TEMPERATURE SENSOR:

Range: 32 to 140°F (0 to 60°C)

Resolution: 0.1°F (0.1°C)

Accuracy: $\pm 2^\circ\text{F}$ ($\pm 0.5^\circ\text{C}$)

INSTRUMENT TEMPERATURE RANGE:

Operating (electronics): 40 to 113°F (5 to 45°C)

Operating (vane head): 32 to 140°F (0 to 60°C)

Storage: -4 to 140°F (-20 to 60°C)

VOLUMETRIC FLOWRATE:

Range¹: 0 to 2,604,000 ft³/min
(0 to 1,230,000 l/s)
(0 to 4,360,000 m³/hr)

DUCT SIZE:

Range: 1 to 250 inches in increments of 0.1 inches
(1 to 635 cm in increments of 0.1 cm)

TIME CONSTANT:

Intervals: 1–10, 15, 20, 25, 30 seconds

LOGGING CAPABILITY:

Range: Up to 999 samples and 285 test IDs

Intervals: 1–10, 15, 20, 25, 30 seconds, 1–10, 15, 20, 25, 30, 60 minutes

EXTERNAL METER DIMENSIONS:

Size measurements: 3.5 in. x 6.8 in. x 1.8 in.
(9 cm x 17 cm x 4.6 cm)

VANE HEAD DIMENSIONS:

Standard Head Diameter (100.0 mm): 4.0 in.

Optional Head Diameter (50.0 mm): 2.0 in.

METER WEIGHT DIMENSIONS:

Weight (with batteries): 1.5 lbs (0.68 kg)

METER DISPLAY DIMENSIONS:

Display: 4-digit LCD, 0.6 in. (15 mm) digit height

POWER REQUIREMENTS:

Four AA-size batteries (included) or

AC adapter (optional)

SERIAL INTERFACE:

Type: RS-232

Baud Rate: Selectable: 1200, 2400, 4800, 9600, 19200

¹Actual range is a function of velocity range and duct size.



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