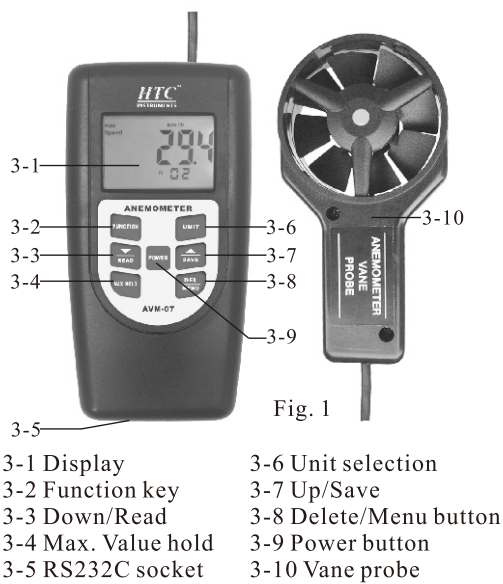# MULTI FUNCTIONAL ANEMOMETER

This Anemometer is small in size, light in weight, easy to carry. Although complex and advanced, it is convenient to use and operate. Its ruggedness will allow many years of use if proper operating techniques are followed. Please read the following instructions carefully and always keep this manual within easy reach.

1.APPLICATION

Widely used in data collection for boiler, refrigeration industry, ventilation duct, environment monitor, navigation measurement, weather forecast, collection of the weather datum for outdoor busywork and fire department.

2. SPECIFICATIONS

2.1 General Specifications

Display	0.5" (13 mm) 4-digit LCD
Measurement units	Air Velocity: m/s, km/h, ft/min, knots
	Air Flow: CMM (m^3/min) ; CFM (ft^3/min)
	Beaufort Scale: Force
	Wave Height: m
	Temp: ℃ & ℉
Data hold	Maximum Value
Data memorized	24 groups

1

Sampling rate	reading per second approx.
Sensors	Air velocity/flow sensor: Conventional angled vane arms with low-friction ball bearing.
	Temperature sensor: Precision thermistor
Automatic Power off	0-9 minutes set by users
Data Output	RS 232 C serial interface
Operating Temperature	32℉ to 122℉ (0℃ to 50℃)
Operating Humidity	Max. 80% RH
Power Supply	4x1.5AAA size
Weight	260g (0.57lb) including batteries & probe
Dimensions	Main instrument: 156x67 x28m (6.1x2.6x1.1")
	Sensor Head: 72mm Diameter
Standard Delivery	Operational manual ········1pcs Carrying case ················1pcs Sensor probe ················1pcs
Optional Accessories	Cable+Software for RS232C

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2.2 Range Specifications

Air Velocity	Range	Resolution	Accuracy
m/s (meters per sec)	0.4-45.0	0.1 m/s	±(2%+ 0.1m/s)
km/h (kilo-meters/hour)	1.4-162.0	0.1 km/hr	±(2%+ 0.1km/hr)
ft/min (feet per minute)	80-8860	0.1 ft/min	±(2%+ 1ft/min)
knots (nautical MPH)	0.8-88.0	0.1 knots	±(2%+ 0.1 nots)
Air Flow			
CMM (cubic meters/min)	0-9999	0.001 to1	
CFM (cubic ft/min)	0-9999	0.001 to1	
Beaufort Scale	0-12	0.1	±0.5
Wave Height	0-14	0.1	±0.1
Air Temperature	14 - 140℉	0.1 ℉	0.9 ℉
	-10-60 ℃	0.1 ℃	0.5 ℃

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3. METER DESCRIPTIONS

Fig. 1

3-1 Display
3-2 Function key
3-3 Down/Read
3-4 Max. Value hold
3-5 RS232C socket
3-6 Unit selection
3-7 Up/Save
3-8 Delete/Menu button
3-9 Power button
3-10 Vane probe

Fig. 2

3-11 Max. value indicator
3-12 Parameter indicator
3-13 Temp. unit
3-14 B. Scale unit
3-15 Area unit
3-16 Speed & Flow
3-17 measurement reading
3-18 Browsing indicator
3-19 Number of reading memorized
3-20 Low battery indicator
3-21 Memory indicator

Side view of Vane
20°
Air direction
20°
Yellow Mark
Fig. 3

4

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4.OPERATION

Turn on the meter using the Power button before taking measurements.

4.1 Air Velocity Measurements

a. Select velocity function using the FUNCTION button. The LCD will display **Speed** when the velocity mode is selected.

b. Select the desired air velocity units using the UNIT button. The LCD will reflect the current unit selection (ft/min, km/h, m/s or knots).

c. Place the sensor in the air current with the yellow dot side of the vane facing the air flow (see Fig.3)

d. Air velocity will be displayed on the upper line of the LCD.

4.2 Air Flow Measurements(CMM /CFM)

a. Select flow function using the FUNCTION button. The LCD will display **Flow** when the flow mode is selected.

b. Select the desired air flow units using the UNIT button. The LCD will reflect the current unit selection (m^3/min, ft^3/min) .

c. Airflow is based on the specific dimensions of the duct being measured. For the meter to correctly measure CMM （Cubic Meter per minute m^3/min） or CFM （Cubic Feet per minute ft^3/min）, the user must input the area of the duct. Failing to input the correct area dimensions will result in erroneous readings. To input the area dimension,

c.1 just press and hold the DEL/MENU key long enough until 'ArEA' showing on the display, then release it immediately. It takes about 8 seconds from depressing the DEL/MENU key.

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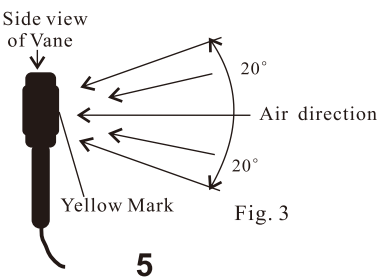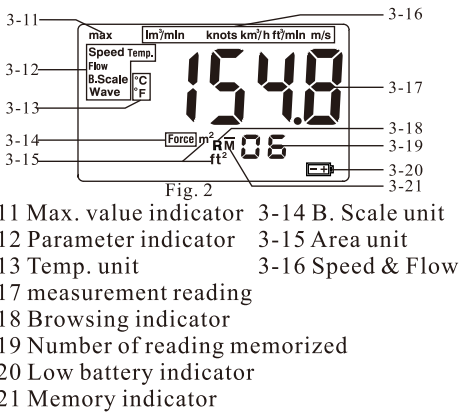
c.2 The previously stored area value will be displayed on the LCD. Please use UP or DOWN key to change the area value to the correct area dimensions. The longer you press the UP or DOWN key, the larger the increment of the value changes. To quit, just press any key except the UP or DOWN key. This procedure can be carried out whenever required as each time the area of the duct is changed.

d. Place the vane in the air flow (Fig.3). Wait approximately 2 seconds for a stabilized Air Flow reading. The equation below is used to calculate Air Flow:

AIR FLOW = (AIR VELOCITY) x (AREA)

4.3 Beaufort Scale Measurements
a. Select Beaufort scale function using the FUNCTION button. The LCD will display **B.Scale** when the flow mode is selected.

b. Place the sensor in the air current with the yellow dot side of the vane facing the air flow (see Fig.3)

c. Beaufort force or scale will be displayed on the LCD.

4.4 Wave Height Measurements
a. Select Wave function using the FUNCTION button. The LCD will display **Wave** when the wave mode is selected.

b. Place the sensor in the air current with the yellow dot side of the vane facing the air flow (see Fig.3)

c. Probable Wave Height in the sea will be displayed on the LCD.

4.5 Air temperature Measurements
a. Select Temp function using the FUNCTION button. The LCD will display Temp. when the temperature mode is selected.

b. Select the desired air Temp units using the UNIT button. The LCD will reflect the current unit selection (℃ & ℉).

c. Place the sensor in the air current.

d. Temperature will be displayed on the LCD.

4.6 Data Hold Feature
While taking measurements, press the MAX button to hold the Maximum reading. The **max** indicator will appear on the LCD when the display is in Maximum Data Hold mode. Press HOLD again to return to normal operation.

5. STORING AND RECALLING READINGS

5.1 When in ' $\overline{M}$ ' state, you can save the reading together with measuring conditions to the memory of the meter by pressing the UP/SAVE key. Then the icon ' $\overline{M}$ 'changes to 'M' automatically while the number of memorized readings increases 1.

5.2 No matter in $\overline{M}$ state or 'M' state, the memorized data can be browsed by depressing the READ key. The browsing state is marked in 'R' on display. When in 'R' state, all the readings memorized can be recalled by depressing the UP key or DOWN key.

5.3 To delete the memorized value in memory, just enter the browsing state and locate the reading to be deleted by the UP key or DOWN key, then depress the DEL key and release it immediately. If there is an "Err0" on the display, it indicates there is no reading to delete any more.

6. HOW TO SET THE TIME OF AUTO POWER OFF

The default setting for auto power off at the factory is 5 minutes. That means the meter will auto power off 5 minutes from the time of last key operation. Users can change it to any value between 1-9 minutes by following steps.

6.1 Just press and hold the DEL/MENU key long enough till 'AUГO ' showing on the DEL/MENU key. (Note: 'ArEA ' is initially displayed but ignore this . And keep holding the button till 'AUГO ' is displayed.)

6.2 The previously set value will be displayed on the LCD. Please use UP or DOWN key to change the value to the correct time from 1 to 9 minutes as desired. To disable the function of auto power off, just preset the time to 0. That is, the meter can only be shut down manually in such a case.

6.3 To quit the setting, just press any key except the UP or DOWN key. This procedure can be carried out whenever required as each time to change the time of auto power off.
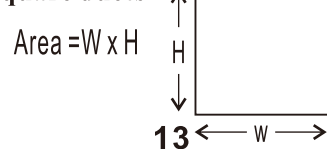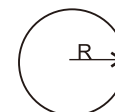
7. BATTERY REPLACEMENT

7.1 When battery voltage less than approx. 5v, it is necessary to replace the batteries.

7.2 Install a the batteries 4x1.5v AAA (UM-4) correctly into the case.

7.3 If the instrument is not to be used for any extended period, remove batteries.

8. USEFUL EQUATIONS AND CONVERSIONS

Area equation for rectangular or square ducts

Area = W x H

Area equation for circular ducts

Circular Duct

$A = \pi R^2$

$(A = 3.14 \times R \times R)$

Cubic equations

$CFM\ (ft^3/min) = Air\ Velocity\ (ft/min) \times Area\ (ft^2)$

$CMM\ (m^3/min) = Air\ Velocity\ (m/sec) \times Area\ (m^2) \times 60$

9. UNITS CONVERSION TABLE

	m/s	ft/min	knot	km/hr	mph
1m/s	1	196.87	1.944	3.6	2.24
1ft/min	0.00508	1	0.00987	0.01829	0.01138
1knot	0.5144	101.27	1	1.8519	1.1523
1km/hr	0.2778	54.69	0.54	1	0.6222
1mph	0.4464	87.89	0.8679	1.6071	1

10. BEAUFORT SCALE AND PROBABLE WAVE HEIGHT

BEAUFORT SCALE AND PROBABLE WAVE HEIGHT

Beaufort Number	Wind	Wind Descriptions		Wind Speed		Wave Height(m)
		Wind	Wave	Knots	m/s	Probable Maximum
0	Calm		—	<1	0-0.2	—
1	Light air	Ripples	1-3	0.3-1.5	0.1	0.1
2	Light breeze	Small wavelets	4-6	1.6-3.3	0.2	0.3
3	Gentle breeze	Large wavelets	7-10	3.4-5.4	0.6	1.0
4	Moderate breeze	Small waves	11-16	5.5-7.9	1.0	1.5
5	Fresh breeze	Moderate waves	17-21	8.0-10.7	2.0	2.5
6	Strong breeze	Large waves	22-27	10.8-13.8	3.0	4.0
7	Near gale	Large waves	28-33	13.9-17.1	4.0	5.5
8	Gale	Moderately high waves	34-40	17.2-20.7	5.5	7.5
9	Strong gale	High waves	41-47	20.8-24.4	7.0	10.0
10	Storm	Very high waves	48-55	24.5-28.4	9.0	12.5
11	Violent storm	Exceptionally high waves	56-63	28.5-32.6	11.5	16.0
12	Hurricane	Exceptionally high waves	64-71	32.7-36.9	14.0	>16