Dew Point + Type K Thermometer

HYGROMETER

Model : HD-3008

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION

TABLE OF CONTENTS

1. FEATURES

* Hygrometer + Dew point + Type K Thermometer are
  combined into one meter, intelligent.
* Dew point measurement.
* Thin-film capacitance sensor for humidity
  measurement, high precision.
* Type K thermometer build in temperature linearity
  & precision cold junction compensation circuit, high
  accuracy.
* Microprocessor circuit assures maximum possible
  accuracy, provides special functions and features.
* Large LCD with two display, easy readout.
* Heavy duty & compact housing case, designed
  for easy carry out & operation.
* Records Maximum and Minimum readings with Recall.
* Auto shut off saves battery life.
* Data hold function for freezing the desired value
  on display.
* RS 232 PC serial interface.
* Show the humidity & temperature values on the
  LCD display at same time.
* Conversion is selected by push button on front
  panel easily.
* Built-in low battery indicator.
* Humidity measurement uses a high precision
  thin-film capacitance sensor for fast response,
  not depending on air flow passing through the probe.
* Humidity probe built-in thermistor sensor for
  temperature measurement, fast response time.
* Wide humidity & temp. measuring range.
* Separate humidity & temp. probe, easy operation. &
  remote measurement.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Custom one-chip of microprocessor LSI circuit.
Display	51 mm x 32 mm, 15 mm (0.6") digit size. dual function LCD display,

Measurement	*Hygrometer :*
	    R.H. (Relative Humidity)
	    Temperature - 蚓, 蚌.

	Dew point :
	Type K thermometer :
Sensor	*Hygrometer (Dew Point) meter :* * Humidity : High precision thin-film capacitance sensor. * Temperature : Thermistor.
	Type K thermometer : Thermocouple probe.
Data Hold	Freeze the display reading by push button.
Memory Recall	Maximum & Minimum.
Sampling Time	Approx. 0.8 second.
Power off	Auto shut off saves battery life or manual off by push button.
Data Output	RS 232 PC serial interface.
Operating Temperature	0 to 50 .
Operating Humidity	Main instrument : Less than 80% R.H. Probe : Less than 95% R.H.
Power Supply	006P DC 9V battery *(Alkaline or Heavy duty type).*

Power Current	Approx. DC 7 mA.
Weight	250 g/0.55 LB.
Dimension	*Main instrument:*
	195 x 68 x 30 mm (7.6 x 2.6 x 1.2 inch)
	Humidity Sensor Probe:
	Round 26 mm Dia. x 160 mm.
Accessories Included	Instruction manual......................1 PC.
	Humidity probe...........................1 PC.
	Carrying case.............................1 PC.
Optional Accessories *ref. page 11*	*33% RH HUMIDITY CALIBRATOR* Model: RHA-33
	75% RH HUMIDITY CALIBRATOR Model : RHA-75
	Type k thermocouple Probe : Model : TP-01, TP-02A, TP-03, TP-04.

2-2 Electrical Specifications (23 5 蚓)

Humidity/ Temperature

Humidity	Range	10 % to 95 % R.H.
	Resolution	0.1 % R.H.
	Accuracy	*70% RH :* (3 % reading + 1 % R.H.)
		< 70 % R.H. : 3% R.H.
Temperature	Range	0 蚓 to 50 蚓, 32 蚌 to 122 蚌.
	Resolution	0.1 degree
	Accuracy	蚓 - 0.8 蚓. 蚌 - 1.5 蚌.

Dew Point

°C	Range	-25.3 °C to 48.9 °C
	Resolution	0.1 °C
°F	Range	-13.5 °F to 120.1 °F.
	Resolution	0.1 °F.

Remark :
* Dew Point display value is calculated from the Humidity/Temp. measurement automatically.
* The Dew Point accuracy is sum accuracy value of Humidity & Temperature measurement..

Type K Thermometer

°C	Range	-100.0 to 1300.0 °C
	Resolution	0.1 °C
	Accuracy *-50.0 to 1300.0 °C : （0.2 % + 0.5 °C)* *-50.1 to -100.0 °C : （0.2 % + 1 °C)*	
°F	Range	-148.0 to 2372.0 °F
	Resolution	0.1 °F.
	Accuracy *-58.0 to 2372.0 °F : （0.2 % + 1 °F)* *-58.1 to -148.0 °F : （0.2 % + 1.8 °F)*	

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3. FRONT PANEL DESCRIPTION

Fig. 1

3-1 Display	3-8 Temp. Probe input Socket
3-2 Power Button	3-9 Humidity Probe input Socket
3-3 REC. Button	3-10 RS-232 Output Terminal
3-4 Hold Button	3-11 Stand
3-5 蚓,蚌 Button	3-12 Sensor Head (R.H., Temp.)
3-6 Function Button	3-13 Probe Handle
3-7 Battery Compartment /Cover	3-14 Probe Plug

4. MEASURING PROCEDURE

4-1 Hygrometer measurement
（Humidity & temperature measurement）

1) Plug the Humidity probe into the " Humidity Probe input Socket " (3-9, Fig. 1).
2) Power on the meter by pressing the Power Button (3-2, Fig. 1), the LCD shows the unit " % RH " & " 蚓 " at the same time and measured value will show on the display (upper display is Humidity value, the lower display is the temperature value) .
3) Press the " 蚓,蚌 Button " (3-5, Fig. 1) to select the temperature unit. You can see the current unit at the bottom-right position of the LCD display.

4-2 Dew point measurement

The procedures of " Dew point measurement " are same as the " Hygrometer measurement ", except select the " Dew point " function by pressing the " Function Button "(3-6, Fig. 1), the LCD will show the unit " DEW " & " 蚓 (or 蚌).

4-3 Type K thermometer measurement

1) Take out the humidity probe away from the " Humidity Probe input Socket " (3-9, Fig. 1).
   * If not take out the humidity probe, the type K measurement will be still available.
2) Plug the optional type K temperature probe into the " Temp. Probe input Socket " (3-8, Fig. 1). Press the " Function Button " (3-6, Fig. 1) once a while until the display showing the unit of " 蚓 " (or 蚌) only.

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4-4 Data Hold

During the measurement, press the " Hold Button " (3-4, Fig. 1) will hold the measured value & the LCD will indicate a " HOLD " symbol on the display.

 * *Press the " Hold Button " again to release the data hold function.*

4-5 Data Record (Max., Min. reading)

* The data record function records the maximum and minimum readings. Press the " REC. Button " (3-3, Fig. 1) to start the Data Record function and there will be a " REC " symbol on the display.
* With the " REC " symbol on the display :
  a) Press the " REC. Button " (3-3, Fig. 1) once, the " REC Max " symbol along with the maximum value will appear on the display.

   If intend to delete the maximum value, just press the " Hold Button " (3-4, Fig. 1) for a while, then the display will show the " REC " symbol only & execute the memory function continuously.

  b) Press the " REC. Button " (3-3, Fig. 1) again, the " REC Min " symbol along with the minimum value will appear on the display.

   If intend to delete the minimum value, just press the " Hold Button " (3-4, Fig. 1) for a while, then the display will show the " REC " symbol only & execute the memory function continuously.

  c) To exit the memory record function, just press the " REC " button for 2 seconds at least. The display will revert to the current reading.

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5. OFFSET TEMPERATURE ADJUSTMENT
   Type K THERMOMETER

The instrument is fully calibrated to assure the high quality measuring performance. Usually it is not necessary to execute the Offset Temperature Adjustment procedures, however the measured result could be influenced by using different type of temperature probes. Under such condition, customer can easily compensate the temperature value by push button on the front panel. However, in general conditions, customers are always not recommended to execute the Offset Temperature Adjustment Procedures without qualified calibration equipment.

Offset Temp. Adjustment Procedure

1) Power on the instrument.
2) Connect with a reliable temperature calibrator.
3) Adjust the calibrator and make it 0.0 output.
4) Press the " Hold Button " (3-4, Fig. 1) and " REC. Button " (3-3, Fig. 1) at the same time for around 1 seconds, the upper display and lower display will show the same value like

<div style="border:1px solid black; text-align:center">

0.2
0.2

</div>

5) Under the " Hold Button " (3-4, Fig. 1) and " REC.
   Button " (3-3, Fig. 1) be pressed condition, press
   " 蚓,蚌 Button " (3-5, Fig. 1) to add 0.1 or press
   " Function Button " (3-6, Fig. 1) to decrease 0.1 to the
   upper digits.

<div style="border:1px solid black; text-align:center; padding:1em">

0.0
0.2

</div>

6) When desired value available, release the fingers from the
   " Hold Button " (3-4, Fig. 1) and "REC. Button " (3-3,
   Fig. 1) to finish the Offset Temperature Adjustment
   Procedures.

CONSIDERATION

**The calibration point is highly recommended at 0.0 or
normal ambient temperature. Please never ever adjust
the offset temperature over this range (0.0 to normal
ambient temperature).**

6. AUTO POWER OFF DISABLE

The instrument has " Auto Power Off " function in order to
prolong battery life. If there are no buttons to be pressed
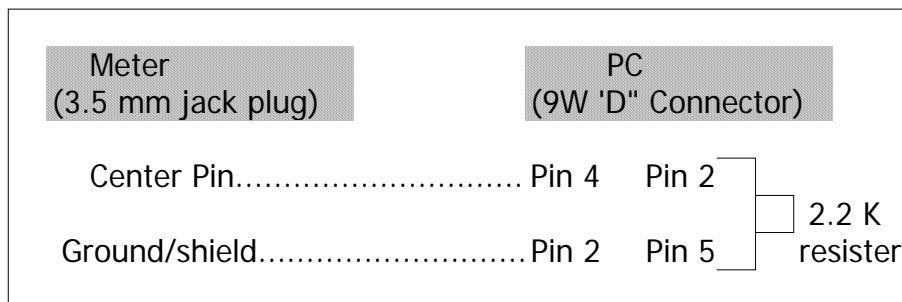for around 10 minutes, the meter will power off automatically.

Disable auto power off function by pressing the " REC. Button "
(3-3, Fig. 1) to get into the " Data Record " function with
a " REC " symbol on the display for long period measurement.

7. RS232 PC SERIAL INTERFACE

*The instrument has RS232 PC serial interface via a 3.5 mm
terminal (3-10, Fig. 1).*

The data output is a 16 digit stream which can be utilized
for user's specific application.

A RS232 lead with the following connection will be required
to link the instrument with the PC serial port.

Meter (3.5 mm jack plug)	PC (9W 'D" Connector)
Center Pin............................ Pin 4	Pin 2 ⌐
	│ 2.2 K
Ground/shield.......................... Pin 2	Pin 5 └ resister

The 16 digits data stream will be displayed in the following format :

D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0

Each digit indicates the following status :

D0	End Word		
D1 & D8	Display reading, D1 = LSD, D8 = MSD *For example :* *If the display reading is 1234, then D8 to D1 is :* *00001234*		
D9	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP		
D10	Polarity 0 = Positive 1 = Negative		
D11 & D12	Annunciator for Display		
	蚓 = 01	蚌 = 02	% RH = 04
D13	When send the upper display data = 1 When send the lower display data = 2		
D14	4		
D15	Start Word		

RS232 FORMAT : 9600, N, 8, 1

8. BATTERY REPLACEMENT

1) When the left corner of LCD display show "   ", it is necessary to replace the battery. However, in-spec. measurement may still be made for several hours after low battery indicator appears before the instrument become inaccurate.

2) Slide the " Battery Cover " (3-7, Fig. 1) away from the instrument and remove the battery.

3) Replace with 9V battery (Alkaline or Heavy duty type) and reinstate the cover.

4) Make sure the battery cover is secured after changing the battery.

9. OPTIONAL PROBES & ACCESSORIES

Type K Thermocouple Probe Model: TP-01	* Measure Rage : -40 ℃ to 250 ℃, -40 ℉ to 482 ℉. * Ultra fast response naked-bead thermocouple, general purpose application.
Type K Thermocouple Probe Model: TP-02A	* Measure Range : -50 ℃ to 900 ℃, -50 ℉ to 1650 ℉. * Dimension: 10 cm tube, 8 mm Dia.
Type K Thermocouple Probe Model: TP-03	* Measure Range :-50 ℃ to 1200 ℃, -50 ℉ to 2200 ℉. * Size: Temp. sensing head - 15 mm Dia. Probe length: 120 mm.
Type K Thermocouple Probe Model: TP-04	* Measure Range : -50 ℃ to 400 ℃, -50 ℉ to 752 ℉. * Dimension: 10 cm tube, 8 mm Dia.

RS232 cable UPCB-02	RS232 cable for connecting between the meter & the computer.
SOFTWARE SW-U801-WIN	Windows version application software applies as the performance of data logging system & data recorder…