

REED

Model C-314

Thermo-Hygrometer/ DataLogger



Instruction Manual

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Safety

Environment conditions

- Altitude up to 2000 meters
- Relatively humidity 90% max.
- Operation Ambient 0 - 50°C

Maintenance & Cleaning

- Repairs or servicing not covered in this manual should only be performed by qualified personnel.
- Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on this instrument.

Safety symbols



Complies with EMC



Read safety information first.

Features

- Dual input thermo-hygrometer with data logging capabilities
- Triple LCD readout displays ambient temperature and relative humidity simultaneously as well as a second temperature reading when thermo-couple input is connected
- °F/°C selectable
- Internal memory can store up to 16,000 readings
- Data Hold and Min/Max function
- RS232 output
- Timer function

Specifications:

Humidity Range:	0 to 100% RH
Resolution:	0.1% RH
Accuracy:	±2.5% RH at 25°C
Temperature Range:	T1: -4 to 140°F (-20 to 60°C); T2: -328 to 2498°F (-200 to 1370°C)
Resolution:	T1: 0.1°F/°C; T2: 0.1° up to 200°; 1° over 200°
Accuracy:	T1: ±1.4°F/0.7°C; T2 at 23°C ± 5°C:

Range	Accuracy
-200°C ~ 200°C	±(0.3% reading + 1°C)
200°C ~ 400°C	±(0.5% reading + 1°C)
400°C~1370°C	±(0.3% reading + 1°C)
-328°F ~ -200°F	±(0.5% reading + 2°F)
-200°F ~ 2498°F	±(0.3% reading + 2°F)

Temperature Coefficient: For ambient temperatures from 0°C - 18°C and 28°C - 50°C, for each °C ambient below 18°C or above 28°C add the following tolerance into the accuracy spec. 0.01% of reading + 0.03°C
0.01% of reading + 0.06°F

Response Time (@t90): Humidity: 75 sec. In slowly moving air;

Temperature: 40 sec. in slowly moving air (T1)

Operating Environment: 0 - 50°C, 32 - 122°F, 0 - 90%RH non-condensing

Storage Environment: -10 - 60°C, 14 - 140°F, 0 - 80%RH non-condensing

Power Supply: Single 9V battery; AC adapter: 9VDC / 10mA min.

Plug Diameter: 3.5 mm×1.35mm

Battery Life: Approx. 100hrs with alkaline battery

Dimensions: Meter: 10.8 x 2.5 x 1.2" (186 x 64 x 30mm)

Probe: 7.5 x 0.6" (190 x 15mm)

Weight: 11.25 oz (320g)

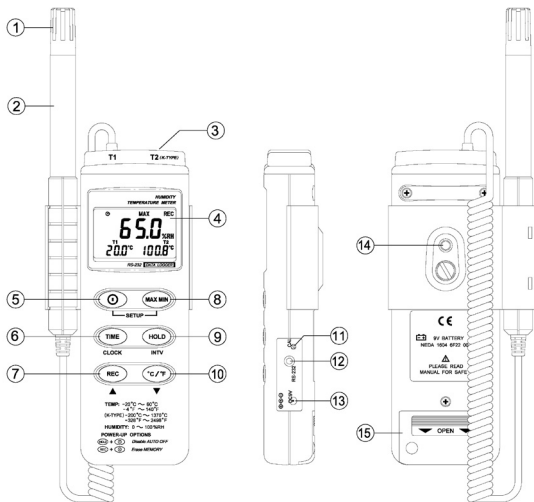
Includes: K-type thermocouple bead probe, probe holder, RS232 cable, software, 9V battery & carrying case

Optional Accessories: Tripod (Model BS-6)

33% Humidity Calibration Standard (Model RHA-33)

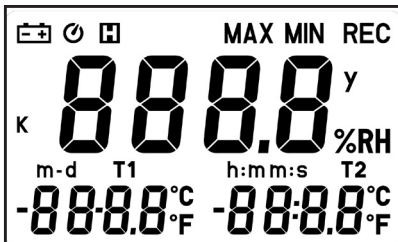
75% Humidity Calibration Standard (Model RHA-75)

Instrument Description:



- 1 - Dust mask
- 2 - Sensor probe
- 3 - T2 channel, "K" type thermocouple probe input
- 4 - LCD display
- 5 - ON/OFF button
- 6 - Time display button
- 7 - Record control button
- 8 - MAX MIN function control button
- 9 - HOLD button
- 10 - °C, °F control button
- 11 - K type offset calibration screw
- 12 - Digital output connector (RS232)
- 13 - AC power adapter connector
- 14 - Tripod connector
- 15 - Battery cabinet cover

Instrument Display



°C°F Centigrade and Fahrenheit indication.

%RH Relative Humidity indication.

MAX The Maximum value is now being displayed

MIN The Minimum value is now being displayed

 This indicates auto power off is enabled.

 This indicates that the display data is being held.

m-d month and day

h:m hour and minute

m:s minute and second

Y year

 The Battery is not sufficient for proper operation.

REC This indicates that the tester is recording.
If it blinks, it indicates the memory is full.

Operation Instructions

Power-Up

Press the **ⓘ** key to turn the Humidity Temperature Meter ON or OFF. Once the instrument is on the display will indicate how much memory is still available.

Humidity and Temperature Measurements

For measurement, place the sensor probe in the test environment.

Connection of the Thermocouples (T2 channel)

For measurement, plug the thermocouple probe into the input connector.

Selecting the Temperature Unit

When the instrument is first turned on, the default scale setting is set at Celsius (°C) scale. It can be changed to Fahrenheit (°F) by pressing “**°C/°F**” button and vice versa to return to Celsius. Next time you turn the instrument on, the scale setting will be the same as when you last turned the instrument off.

Data-Hold Operation

The user may hold the present reading and keep it on the display by pressing the “**HOLD**” button. When the hold data is no longer needed, one may release the data-hold operation by pressing “**HOLD**” button again.

When the meter is under Data Hold operation, the “**MAX/MIN**” and “**°C/°F**” buttons are disabled. When you press the “**MAX/MIN**” and “**°C/°F**” buttons when in HOLD mode, two continuous beeps will sound.

Data Logger

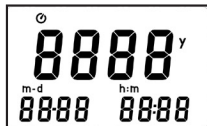
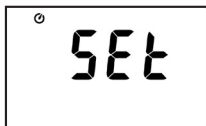
When the “**REC**” button is pressed, the meter will start recording, press the “**REC**” button again to stop recording. If you want to clear the memory, turn the instrument off and press and hold “**REC**” button and press power button.

Release all the buttons and the display will show “**CLR**” indicating that the memory has been cleared.



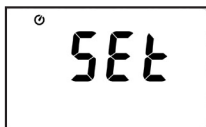
Clock Setup

- 1) Press and hold the “MAX/MIN” button and turn the meter on
 - 2) Press the “TIME/CLOCK” button
 - 3) Press the “REC” ▲ or “°C/°F” ▼ buttons to set the data
 - 4) Press the “TIME/CLOCK” button to set the next item
The adjusting order is year, month, day, hour, minute
 - 5) Press the “TIME/CLOCK” button finish the set up
- If you want stop during the setup process, press power button to cancel



Recording Interval Setup

- 1) Press and hold the “MAX/MIN” button and turn the instrument on:
 - 2) Press the “HOLD/INTV” button
 - 3) Press the “REC” ▲ or “°C/°F” ▼ buttons to set the data
 - 4) Press the “HOLD/INTV” button to set the next item
 - 5) Press the “HOLD/INTV” button to finish the set up
- If you want stop during the setup process, press power button to cancel



Time Operation

When you press the “TIME” button, the display will show the time and it will show the year at the top, the month and day at the bottom/left, the hour and minutes on the bottom/right of the display.

Press the “TIME” or any other button to exit this mode.

This operation will not interrupt the recording and “MAX/MIN” operation.

MAX/MIN Operation


Pressing the “**MAX/MIN**” button places the meter in the “**MAX/MIN**” mode. Under this mode the maximum value and minimum value is kept in the memory simultaneously and updated with every new data.

When the **MAX** symbol is display, the Maximum is shown on the display. Press “**MAX/MIN**” again, then the **MIN** symbol is on the display and also the minimum reading.


Press “**MAX/MIN**” again, **MAX**, **MIN** will blink together. This means that all these data is updated in the memory and the reading is the present temperature and humidity.

Press the “**MAX/MIN**” button to circulate the display mode among these options. When the meter is under “**MAX/MIN**” operation, the “°C/°F” button is disabled. To exit the “**MAX/MIN**” mode, press and hold the “**MAX/MIN**” button for two seconds.

Auto Power Off

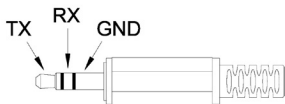
By default, when the meter is powered on, it is under auto power off mode. The meter will power itself off after 30 minutes if no key operation is performed. To disable the auto power off feature, press and hold the “**HOLD**” button and then power on the meter. The auto power off symbol  will disappear to indicate that auto power off is disabled.

Low Battery Indication

When the battery voltage is under proper operation requirement, the  symbol will show on the LCD and the battery needs to be replaced with a new one.

Digital Output

The Digital Output is a 9600bps N 81 serial interface.



WARNING!

1. Don't touch or manipulate the sensor.
2. Don't expose the sensor to direct light , this causes a false reading.
3. Don't expose the sensor to static electricity.

Thermocouple Probe Specifications

Model	Range	Tolerances	Description
TP-K01	-50°C to 200°C	±2.2°C or ±0.75%	With Teflon tape insulation. Maximum insulating temperature: 260°C
Bead Probe	-58°F to 392°F	±3.6°F or ±0.75%	

TP-K01: Probe for general condition measurements, especially for complex and hard to reach places.



Calibration Procedures

Humidity Calibration

1. Turn the instrument off.
2. Press the “**MAX/MIX**”, “**HOLD**” and “**REC**” buttons, then press the “**POWER**” button to turn the instrument on. Release all buttons. The display will blink and within 3 seconds you will have to press the “**°C/°F**” and “**TIME**” buttons at the same time to enter calibration mode.
3. When the instrument enters the calibration mode, the humidity reading will blink and “**CAL1**” will show in the display on the second display.
4. Put the humidity probe into the standard humidity cavity of 32.8%RH@25°C for 20 minutes then press the “**MAX/MIN**” button to start the adjusting. If the instrument recognizes the value is out of tolerance, the instrument will sound 2 beep and it will remain in “**CAL1**” mode. If it recognizes the value is within tolerance, new calibration data is created and the tester will go into “**CAL2**” mode. Which will be indicated by “**CAL2**” in the second display.
5. Put the humidity probe into the standard humidity cavity of 75.3%RH@25°C for 20 minutes then press the “**MAX/MIN**” button to start the adjusting. If the instrument recognizes the value is out of tolerance, the instrument will sound 2 beep and it will remain in “**CAL2**” mode. If it recognizes the value is within tolerance, new calibration data will be stored into the memory and the calibration is done.

continued ...

Notes:

1. When performing the humidity calibration, the environment should be kept at the stable condition to increase the accuracy.
2. After the probe is inserted into the standard humidity cavity, wait at least 20 minutes to let the condition in the cavity to stabilize.
3. During the calibration, if the user presses the “**POWER**” button at any time, the instrument will go back to normal operation mode and no calibration data will be changed.
4. During the calibration mode, the user can restore the factory default value by pressing the “**HOLD**” and “**REC**” buttons at the same time.
5. It takes some time to stabilize the system, therefore it's recommended the operator first insert the probe into the 32.8%RH@25°C standard cavity and wait for at least 20 minutes, then turn the instrument on and start the calibration process.
6. During the calibration, all the displayed reading is calibrated with the old calibration data and the auto power function is disabled. Until the calibration process is done, the instrument will enable auto power function again.
6. During the calibration, the temperature scale is set at °F and is not selectable.

T1 Temperature Calibration

1. Turn the meter off.
2. Press the “**MAX/MIX**”, “**HOLD**” and “**REC**” buttons, then press the “**POWER**” button to turn the instrument on. Release all buttons. The display will blink and within 3 seconds you will have to press the “**°C/°F**” and “**HOLD**” buttons at the same time to enter calibration mode.
3. When the meter enters the calibration mode, the meter will show “**CAL1**” in the LCD window.
4. Place the probe into the standard cavity of 40°C (104°F) for 20 minutes then press the “**MAX/MIN**” button to start the adjusting. If the instrument recognizes the value is within tolerance, new calibration data will be stored into the memory and the calibration is done. If the instrument recognizes the value is out of tolerance, it will beep 2 times and remain in “**CAL2**” mode.

continued ...

Notes:

1. After the probe is in the calibration cavity, wait at least 20 minutes to stabilize the system.
2. During the calibration, the user can leave the process by pressing the “**POWER**” button at any time and the calibration data will be kept unchanged.
3. During the calibration mode, the user can restore the factory default value by pressing the “**HOLD**” and “**REC**” buttons at the same time.
4. It takes some time to stabilize the system, therefore it's recommended the operator first insert the probe into the 0°C standard cavity and wait for at least 20 minutes, then power the unit on and start the calibration process.
5. During the calibration, all the displayed reading is calibrated with the old calibration data and the auto power function is disabled. Until the calibration process is done, the instrument will enable auto power function again.
6. During the calibration, the temperature scale is set at °F and is not selectable.

TestLink (Humidity DataLogger) Set Up *RS232 interface software*

The TestLink package contains: One setup CD and custom designed RS232 cable for TestLink.

System Requirements: Windows 2000//XP/2003 Server/Vista.

Minimum Hardware Required: 486-100 MHz PC compatible, 16 MB RAM; at least 5 MB hard disk space available to install TestLink program. Recommended display resolution of 800 X 600.

Installing TestLink:

- 1) Close all other applicationd before installing TestLink
- 2) Insert the TestLink CD-ROM into your CD drive. The TestLink installer should start automatically. If it does not, you can start it by running SETUP.EXE from the root drive of the CD-ROM.
- 3) When installation is complete, it will copy TestLink.exe (executable file) and help file to your hard disk (default is c:\program files\ TestLink)
- 4) For other operation instructions, please refer to the on-line help while executing TestLink.

continued ...


Running TestLink

Select TestLink form “START” of Windows:

The screenshot displays the TestLink software interface. On the left is a virtual representation of a handheld device with a screen showing '92.4' and '63.3'. The main window features a 'Menu and Tool Bar' at the top with a 'Sampling Rate' field set to '90.07'. Below this is a 'Real Time Graph' showing a fluctuating data line. At the bottom is a 'Real Time Tabular' data table. A 'Bi-direction Control Panel' is located on the left side of the main window.

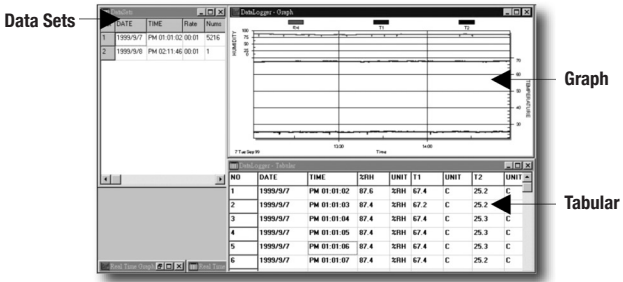
NO	DATE	TIME	SIHH	UNIT	F1	UNIT	F2	UNIT	FUNCTION
96	1999/5/15 PM	13 13 33	92.0	SIHH	67.3	C	69.3	C	
97	1999/5/15 PM	13 13 35	92.9	SIHH	67.3	C	69.3	C	
98	1999/5/15 PM	13 13 37	92.8	SIHH	67.3	C	69.3	C	
99	1999/5/15 PM	13 13 39	92.6	SIHH	67.3	C	69.3	C	
100	1999/5/15 PM	13 13 41	92.6	SIHH	67.3	C	69.3	C	
101	1999/5/15 PM	13 13 43	92.5	SIHH	67.3	C	69.3	C	

Real Time Tabular and Real Time Graph.

Select Run from menu or press  from the tool bar to begin real time data collection from the humidity meter. You can change the data interval by editing the sampling rate box on the right hand side of tool bar.

DataLogger

Select DataLogger from menu to load recorded data for humidity meter. There will be a progress bar showing how many bytes should be loaded and how many bytes have been received. When data is loaded successfully, there will be three new window show up.



Data Sets Window – Display how many data sets were loaded and the detail information for each data set (start date, start time, recording rate and data length), and you can click at any data set to choose the set for graph and tabular Window.

Note: For other operation instruction, please refer to the on-line help while executing TestLink.

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