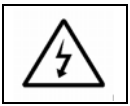
HUMIDITY/TEMP. CONTROLLER/MONITOR

Model : PHT-3109

Your purchase of this HUMIDITY/TEMP. CONTROLLER, MONITOR marks a step forward for you into the field of precision measurement. Although this METER is a complex and delicate instrument, its durable structure developed. Please read the following instructions carefully and always keep this manual within easy reach.

OPERATION MANUAL

Caution Symbol



Caution :

* Risk of electric shock !

Caution :

* Do not use fingers or any tool to touch the Wire Terminals.
* Do not apply the relay contact load current > 0.5 Amp.
* The instrument contains no user serviceable parts and should not be opened by the user.
* Repair or after service should be done by a qualified technician only.
* Power supply should apply the correct ACV power voltage
* Cleaning - Only use the dry cloth to clean the plastic case !

*** Equipment protectted throughout by Double Insulation or Reinforced Insulation.**

Environmental Condition

* Comply with EN61010.
  Transient overvoltage at Mains Supply 2500V.
* Pollution Degree 2.
* Altitude up to 2000 meters.
* Indoor use.
* Relative humidity 80% max.

TABLE OF CONTENTS

1. FEATURES

* Professional Humidity measurement monitor and controller.
* Build in humidity control relay and the Temp. control relay.
* Relay will be make action (On/Off) when the reading value reach high limit or low limit value.
* Offset value setting.
* Hysteresis value setting for high and low alarm.
* ℃,℉ temp. unit setting with default.
* High precision humidity sensor with fast response time and high accuracy.
* Large red LED display, high brightness and easy to read.
* RS232 computer interface, send out the humidity and the temperature data at the same time.
* Optional data acquisition software.
* Optional GSM controller.
* Microprocessor circuit ensures high accuracy and provides special functions and features.
* Standard 96 X 48 mm DIN case.

2. SPECIFICATIONS

2-1 General Specifications

Display	4 digits red LED, digit size : 14 mm.	
Unit	Temp.	℃, ℉
	Humidity	%RH
Circuit	Custom chip of microprocessor LSI circuit.	
Sensor Structure	Humidity	Semiconductor
	Temperature	Semiconductor

Sampling Time	Approx. 1 second.	
Relay outputs	Number	2 relays
	Function	*Relay 1 :* Humidity control relay. *Relay 2 :* Temperature control relay.
	Max load 	0.5 ACA/250 ACV 0.5 DCA/24 DCV **** Do not apply the relay contact load current > 0.5 A, other wise the relay may be damaged permanently without warranty.***
Setting value	High limit value setting. Low limit value setting. Hysteresis value setting. Offset value setting. ** Setting for Humidity and Temp.*	
External Power Supply	DC 12 V, 50 mA max.	
Data Output	RS 232 PC serial interface.	
Operating Temperature	0 to 50 ℃. ** Meter*	
Operating Humidity	Less than 80% R.H. ** Meter*	
Power Supply	90 to 260 ACV, 50/60 Hz.	
Power Consumption	Approx. 4.7 VA/AC 110V. Approx. 5.3 VA/AC 220V.	
Weight	384 g/ 0.84 LB. ** Including probe.*	
Dimension	DIN size : 96 x 48 mm. Depth : 110 mm.	
Accessories Included	Instruction manual.....1 PC Humidity/Temp. probe..... 1 PC Case holder with screw..... 2 PCs Probe fix holder.....1 PC	

Optional Accessories	* Data Acquisition software, SW-U801-WIN. * RS232 cable, UPCB-02.
	* GSM controller, GSM-889. * Interface cable (cable between meter to GSM-889), GMCB-89.

2-2 Electrical Specifications (23± 5 ℃)

Humidity

Range	10 % to 95 % R.H.
Resolution	0.1 % R.H.
Accuracy	≧70% RH ± (3% reading + 1% RH). < 70% RH - 3% RH. ± 3% RH.

Temperature

Measuring Range	0 ℃ to 50 ℃/32 ℉ to 122 ℉
Resolution	0.1 ℃/0.1 ℉
Accuracy	± 0.8 ℃/1.5 ℉

** The above specifications is for the probe only.*
** Above specification tests under the environment RF Field Strength less than 3 V/M & frequency less than 30 MHz only.*

3. FRONT PANEL DESCRIPTION

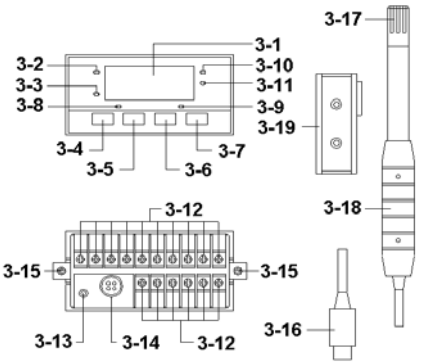
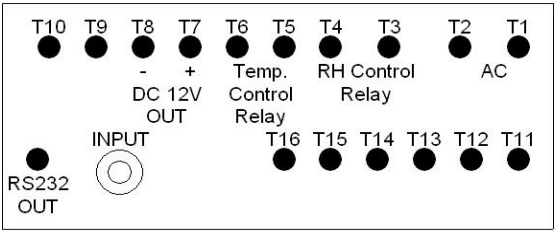


Fig. 1

3-1 Display
3-2 PV (process value) indicator
3-3 SV (set value) indicator
3-4 Set Button
3-5 ▼ Button
3-6 ▲ Button
3-7 RH/Temp Button
3-8 %RH control relay indicator
3-9 Temp. control relay indicator
3-10 %RH (humidity) indicator
3-11 Temp. indicator
3-12 Wire terminals
3-13 RS232 terminal
3-14 Input socket
3-15 Case holder
3-16 Probe plug
3-17 Probe head (Humidity & Temperature)
3-18 Probe handle
3-19 Probe fix holder

4. MEASURING PROCEDURE



Terminal layout Fig. 2

4-1 Terminal connection

1) Input the ACV power (90 to 260 ACV) to T1, T2.

Do not input the over voltage to the AC input terminals.

2) Connect the " Humidity Control Relay " output from T3, T4. Connect the " Temp. Control Relay " output from T5, T6.

4-2 Humidity/Temp. measurement

1) Connect the " Probe plug " (3-16, Fig. 1) to " Input socket " (3-14, Fig. 1).
2) Power on the meter, the " Display " (3-1, Fig. 1) will show the humidity value, in the same time the " %RH indicator " (3-10, Fig. 1) will light.

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3) Press the " RH/Temp Button " (3-7, Fig. 1) once, the " Temp. indicator " (3-11, Fig. 1) will light, the " Display " (3-1, Fig. 1) will show the Temp. value.

** Press the " RH/Temp Button " (3-7, Fig. 1) once again, the " Display " will return the " Humidity value ", in the same time the " %RH indicator " (3-10, Fig. 1) will light again.*

4-3 1st layer setting procedures

LoLt	**Low Limit**
HILt	**High Limit**

Low Limit Value Setting

1) Press the " Set Button " (3-4, Fig. 1) once, the " Display " will show " LoLt ", now the meter is ready for the Humidity " Low Limit " value setting.

Press the " RH/Temp Button " (3-7, Fig. 1) once, the " Temp indicator " (3-11, Fig. 1) will light, now the meter is ready for the Temperature " Low Limit " value setting.

Remark :

- ***Under " Display " show " LoLt ", if " % RH indicator " (3-10, Fig. 1) is lit, meter is ready for " Humidity Low Limit " setting.***
- ***Under " Display " show " LoLt ", if " Temp. indicator " (3-11, Fig. 1) is lit, meter is ready for " Temperature Low Limit " valuesetting.***
- ***The function of " Low Limit value " setting, refer to page 10, Fig. 2.***

2) Use the " ▼ Button " (3-5, Fig. 1) and the " ▲ Button " (3-6, Fig. 1) to adjust the desiring " Low Limit " value.

** When adjust the value, the " SV indicator " (3-3, Fig. 1) will light.*

High Limit Value Setting

1) After set the " Low Limit " value, press the " Set Button " (3-4, Fig. 1) twice, the " Display " will show " HILt ", now the meter is ready for the humidity " High Limit " value setting.

Press the " RH/Temp Button " (3-7, Fig. 1) once, the " Temp indicator " (3-11, Fig. 1) will light, now the meter is ready for the Temperature " High Limit " value setting.

Remark :

- ***Under " Display " show " HILt ", if " % RH indicator " (3-10, Fig. 1) is lit , meter is ready for " Humidity High Limit value " setting.***
- ***Under " Display " show " HILt ", if " Temp. indicator " (3-11, Fig. 1) is lit, it meter is ready for " Temperature High Limit value " setting.***
- ***The function of " High Limit value " setting, refer to page 10, Fig. 2.***

2) Use the " ▼ Button " (3-5, Fig. 1) and the " ▲ Button " (3-6, Fig. 1) to adjust the desiring " High Limit " value.

** When adjust the value, the " SV indicator " (3-3, Fig. 1) will light.*

After adjust the " High Limit " value, press the " Set Button " (3-4, Fig. 1) twice, " Display " will return to the normal measuring screen.

4-4 2nd layer setting procedures

tPty	**Temp. unit setting**
HySt	**Hysteresis setting**
oFSt	**Offset setting**

Temperature unit setting

1) Press the " Set Button " (3-4, Fig. 1) continuously at least two seconds, the " Display " will show " tPty ", now the meter is ready for the Temperature unit (℃, ℉) setting.
2) Use the " ▼ Button " (3-5, Fig. 1) and the " ▲ Button " (3-6, Fig. 1) to adjust the desiring temperature unit to " C " or " F ".
   ** When adjust the Temp. unit, the " SV indicator " (3-3, Fig. 1) will light.*

Hysteresis value setting

1) After select the temperature unit (℃,℉), press the " Set Button " (3-4, Fig. 1) twice, the " Display " will show HySt ", now the meter is ready for the the Hysteresis value setting.
2) Use the " ▼ Button " (3-5, Fig. 1) and the " ▲ Button " (3-6, Fig. 1) to adjust the desiring Hysteresis setting value.
   * *When adjust the Hysteresis value, the " SV indicator " (3-3, Fig. 1) will light.*

   Press the " RH/Temp Button " (3-7, Fig. 1) once, the " Temp indicator " (3-11, Fig. 1) will light, now the meter is ready for the Temperature " Hysteresis " value setting.

Remark :

* ***Under " Display " show " HySt ", if " % RH indicator " (3-10, Fig. 1) is lit, meter is ready for " Humidity Hysteresis value " setting.***
* ***Under " Display " show " HySt ", if " Temp. indicator " (3-11, Fig. 1) is lit, meter is ready for " Hysteresis value " setting.***
* ***The function of " Hysteresis value " setting, refer to page 10, Fig. 2.***

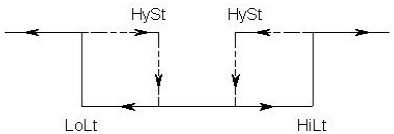


Fig. 2

High limit value : 100
Low limit value : 20
Hysteresis value : 5

* **The control relay will On when measuring value up to 100. The control relay will Off again when measuring value down to 95.**
* **The control relay will On when measuring value down to 20. The control relay will Off when measuring value up to 25.**

Offset value setting

1) After finish the Hysteresis setting, press the " Set Button " (3-4, Fig. 1) twice, the " Display " will show " oFSt ", now the meter is ready for the the offset value setting.
2) Use the " ▼ Button " (3-5, Fig. 1) and the " ▲ Button " (3-6, Fig. 1) to adjust the desiring offset value.
   * *When adjust the Offset value, the " SV indicator " (3-3, Fig. 1) will light.*

Press the " RH/Temp Button " (3-7, Fig. 1) once, the " Temp indicator " (3-11, Fig. 1) will light, now the meter is ready for the Temperature " Offset " value setting.

Remark :

- ***Under " Display " show " oFSt ", if " % RH indicator " (3-10, Fig. 1) is lit, meter is ready for " Humidity Offset value " setting.***
- ***Under " Display " show " oFSt ", if " Temp. indicator " (3-11, Fig. 1) is lit, meter is ready for " Temperature Offset value " setting.***
- ***For example of " Offset value setting " :***

  The reading value is 102.

  The offset value is 5.

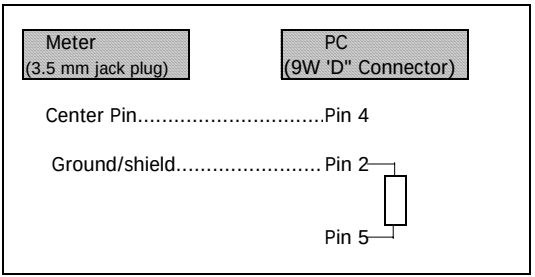
  The new display value will be 107 (102 + 5).

5. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-13, 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.



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 :

D15	Start Word		
D14	4		
D13	When send the upper display data = 1 When send the lower display data = 2		
D12 & D11	Annunciator for Display		
	℃ = 01	℉ = 02	m/S = 08
	km/h = 10	mph = 12	knot = 09
	FPM = 11	%RH = 04	dB = 17
	LUX = 15	Ft-cd = 16	
D10	Polarity 0 = Positive 1 = Negative		
D9	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP		
D8 to D1	Display reading, D8 = MSD, D1 = LSD. For example : If the display reading is 1234, then D8 to D1 is : 00001234		
D0	End Word		

RS232 setting

Baud rate	9600
Parity	No parity
Data bit no.	8 Data bits
Stop bit	1 Stop bit

6. SYSTEM RESET

Power on the meter, use the two fingers to press " Set Button " (3-4, Fig. 1) and " RH/Temp. Button " (3-7, Fig. 1) continuously more than 5 seconds until the Display show the text " rSt ", release the buttons. After " rSt " text flashing 2 times will return to the normal screen. The meter system will be reset, all the calibration data will be cleared, the meter's internal function will return the default value.

7. THE ADDRESS OF AFTER SERVICE CENTER