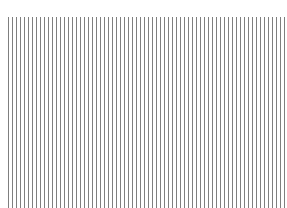


CHINO

**HN-EH Series
Handheld type
temperature/humidity
meter**

Instruction Manual



INSTRUCTIONS

This instruction manual shall be kept carefully in a safe place near this product.

CHINO

1. Introduction

Thank you for purchasing HN-EH Series Handheld type temperature/humidity meter. To use this meter safely, read this instruction manual beforehand in order to understand proper handling and precautions.

Keep this manual with due care after reading.

■ Before use

- After opening a package, confirm the followings before using the meter. If you notice any shortage, contact your distributor or your nearest Chino's office.

| Name | Quantity |
|-------------------------|-------------------------------------|
| This meter | 1 |
| Sensor protection cover | 1 (only for HN-EHBN and HN-EHSN) |
| AAA alkaline battery | 2 |
| Instruction manual | 1 |

- Batteries are not loaded to the meter at factory default state. Refer to the section “7. Loading and Replacement of Batteries (P. 7)” to load attached batteries (AAA size alkaline battery x2).
- Attached batteries are for operation check and life of the batteries are not guaranteed.
- Neck strap is not included in the package. Please prepare it for yourself.
- Protection shield is pasted on the front of the meter. Peel it off before use.
(Refer to figure on the right)

■ About this instruction manual

- No part of this manual can be reproduced or copied in any form without permission.
- The descriptions of this manual are subjected to change without notice.
- Figures in this instruction manual may be emphasized, simplified or omitted.
- If any questions arise or if any misspellings and/or omissions are found, please contact your distributor or nearest CHINO office.
- Other described company names and product names are trademarks and registered products of the respective companies.





【Terms of Disclaimer】


- Except for provided warranty provisions, CHINO cannot guarantee with regard to this meter.
- CHINO assumes no liability for loss or damage of any kind resulting from direct or indirect use of this meter, or unexpected malfunctions of said product by you or the third party.


2. Warning and Safety Notice

- Warning and safety notice described in this instruction manual contains important facts of safety, therefore understand the contents thoroughly, and observe them strictly.
- For safe use of this meter, following symbol and indications are described in this instruction manual. These notice contain important facts of safety, therefore understand the contents thoroughly, and observe them strictly.

| | |
|--|---|
|  Warning | It indicates possible <u>death</u> or <u>serious injury</u> of user due to wrong handling. |
|  Caution | It indicates possible <u>injury</u> and <u>property damage</u> of user due to wrong handling. |

[Safety Precautions]

| |
|--|
|  Warning |
| <ul style="list-style-type: none"> •Do not use this meter for medical equipment. •It may cause accident such as fire and/or injury. Do not use this meter in places where risks of inflammation and explosion exist. •Do not use this meter for measuring other than original purpose. •When this meter gets strong shock by dropping etc., sensor may be damaged and scattering of the fragments may cause an injury. Do not give any shocks. |

| |
|--|
|  Caution |
| <ul style="list-style-type: none"> •Do not use any battery other than specified. Using other batteries may cause electrolyte leakage or burst and damage the meter.(P.7) •Do not measure temperature exceeding measuring temperature rang. It may cause trouble and/or damage. •Disassembling and altering of this meter is prohibited. •For replacing consumable parts, make sure to use CHINO's specified parts.(P.8) •Do not use or store this meter in the places where is exposed to direct sun light or high temperature. Also, do not put this meter in environment where would be high temperature for a long time such as in a car, it may cause discoloration, deformation and damage of the meter. |

- Also follow the safety instructions of this manual when handling accessories to connect to the meter. If fail to follow these instructions, CHINO do not guarantee the safety.
- For the usage which requires special safety such that hold huge influence to human life and/or property, consider safety measurements as allow extra for rating and function to use, and also take fail-safe procedure.

3. Precautions for Use

General terms

- This sensor is precision instrument, do not drop it and do not give strong impact
- If this meter is dropped, sensor part may break. Pay attention not to get injured by the fragments.
When not using the meter, put sensor protection cover (for HN-EHBN and HN-EHSN).
- When using the meter, take the sensor cover off.
- Install or stores the meter in out of children's reach.
- Do not push display and keys strongly. By doing so, these may get broken.
- This meter is not waterproof. Avoid using it in the environment where splash of the water is expected.
- If the temperature changes rapidly, the case of the meter may be cracked and/or deformed.
Pay attention not to get injured by it.
- Avoid using this meter in following places.
Places where dust exists.
Places where much ketones organic solvent, esters organic solvent, halogen, strong acid-base substance, oil mist or salt mist exists.
Places where explosive gas, corrosive gas or flammable gas exists.
Places where steam, chemicals or seawater splashes.
Places where expose to direct sunlight, ultraviolet light, and where drying paint etc.
- Caulking materials used in construction may include substance which deteriorates the sensor.
Avoid using this meter in such place for a long period of time.

Terms related to the battery

- After the battery replacement, lock the battery cover securely.
- When this meter is not used for long period, remove the battery from it and store. The electrolyte leakage from the battery may result in failure and/or malfunction of this meter.
- When the battery reaches its life, replace the battery promptly. Leaving the old battery may cause electrolyte leakage.
- The battery life depends on the measurement environment, setting of this meter and the type of battery used.
- Observe the precautions described on the battery.

Terms for stable usage

- Use the meter away from electric apparatus such as TV, microwave and/or radio which generate strong static electricity and/or electromagnetic wave. These may cause malfunction.
- Do not use the meter deteriorated or damaged. Otherwise, the temperature/humidity may not be measured correctly.
- Correct measurement is not ensured, in the places where expose to the direct strong wind.
Avoid influence of the wind and perform the measurement.

Terms for cable (only for HN-EHSP)

- Do not pull cable. Otherwise, it may cause a disconnection of the cable.
- Pay attention the cable get damaged easily if the meter is used in the below 0°C environment.
- Choking hazard. Do not put the cable around your neck.

Terms for maintenance

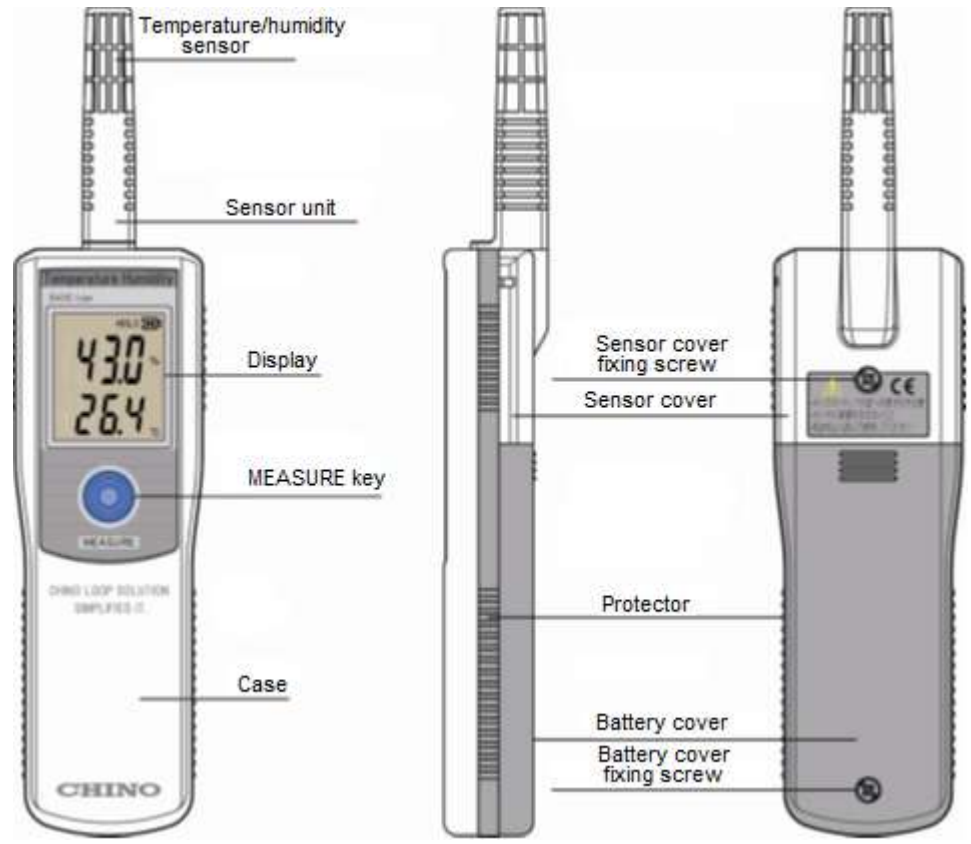
- Do not store this meter in places where is -20°C or less, or 60°C or more, places where generates dew condensation and humidity 90%RH or more.
- Avoid storing this meter in following places.
 - Places where dust exists.
 - Places where much ketones organic solvent, esters organic solvent, halogen, strong acid-base substance, oil mist or salt mist exists.
 - Places where explosive gas, corrosive gas or flammable gas exists.
 - Places where steam, chemicals or seawater splashes.
 - Places where expose to direct sunlight, ultraviolet light, and where drying paint etc.
- For cleaning of this unit, wipe off its surface lightly with a well-wrung cloth. Do not use chemicals and bleach etc.
- Put on the sensor protection cover and store this meter while not in use. (for HN-EHBN and HN-EHSN).
- When you need our service such as repair, please contact your distributor or nearest CHINO's office.

4. Table of Contents

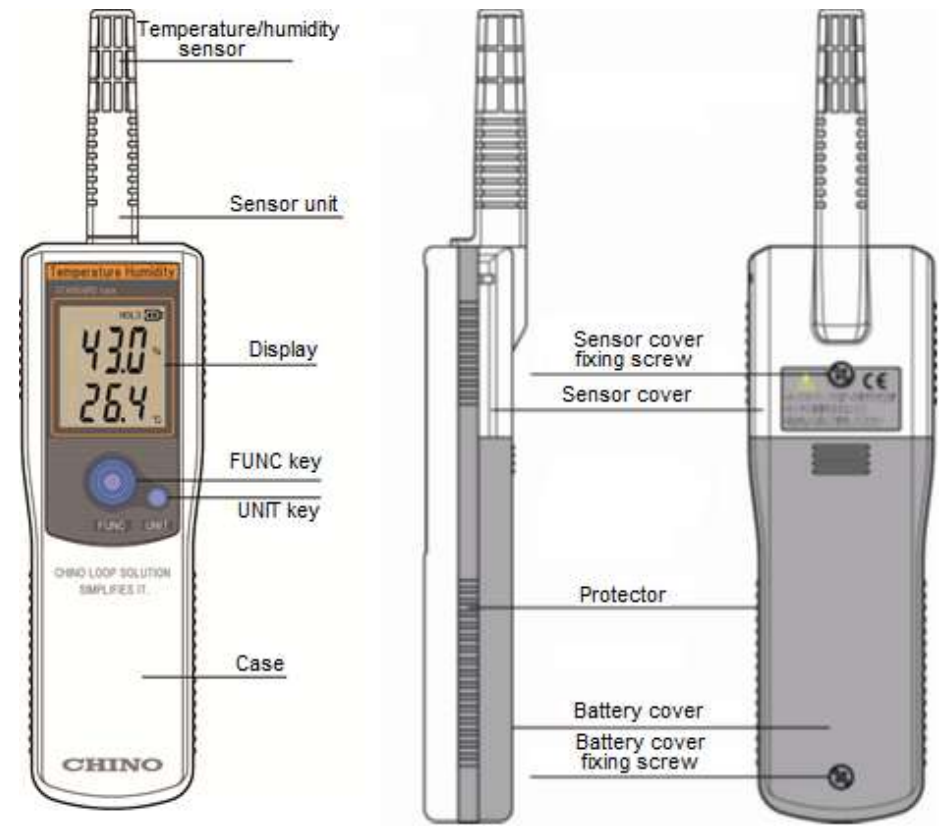
| | |
|--|-------|
| 1. Introduction..... | 1 |
| 2. Warning and Safety Notice..... | 2 |
| 3. Precautions for Use..... | 3-4 |
| 4. Table of Contents..... | 4 |
| 5. Part Names..... | 5-6 |
| 6. LCD..... | 6 |
| 7. Loading and Replacement of Batteries..... | 7 |
| 8. Installing and Replacement of Sensor..... | 8 |
| 9. How to Use Sensor Protection Cover, Confirm Model Code and Place Neck Strap..... | 9 |
| 10. Key Operation and Indication Function..... | 10-12 |
| 11. Description of Indication..... | 13-14 |
| 12. Troubleshooting..... | 15 |
| 13. Specifications..... | 16 |
| 14. External Dimensions..... | 17-18 |

5. Part Names

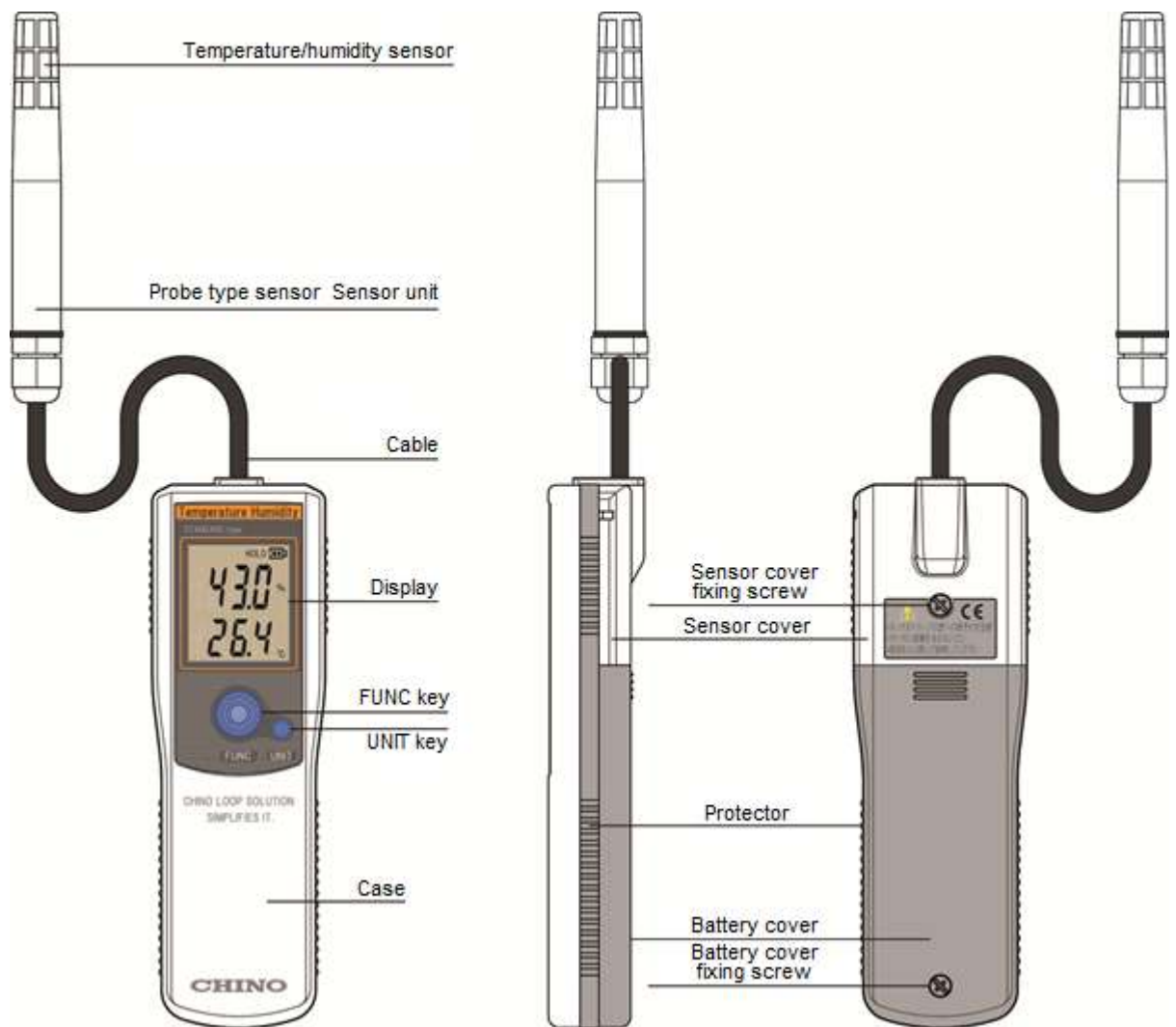
HN-EHBN/BASIC type



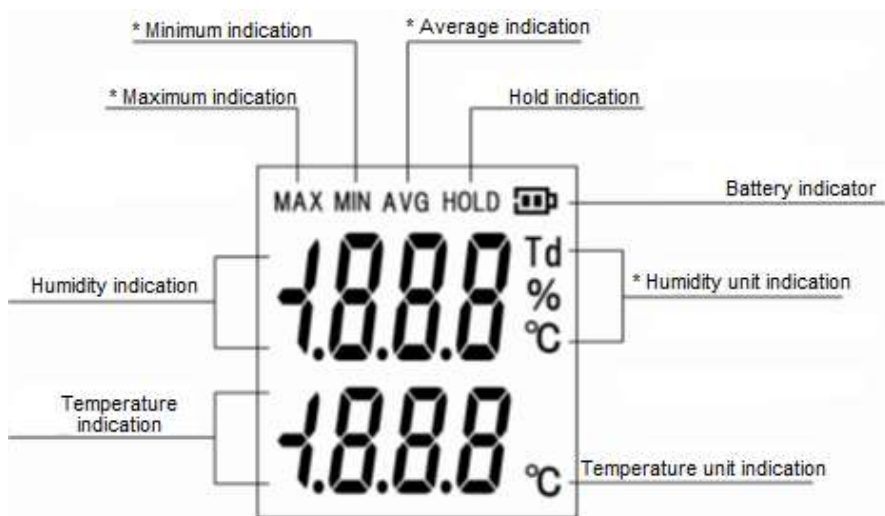
HN-EHSN/STANDARD type I (Built-in)



HN-EHSP/STANDARD type II (Probe)

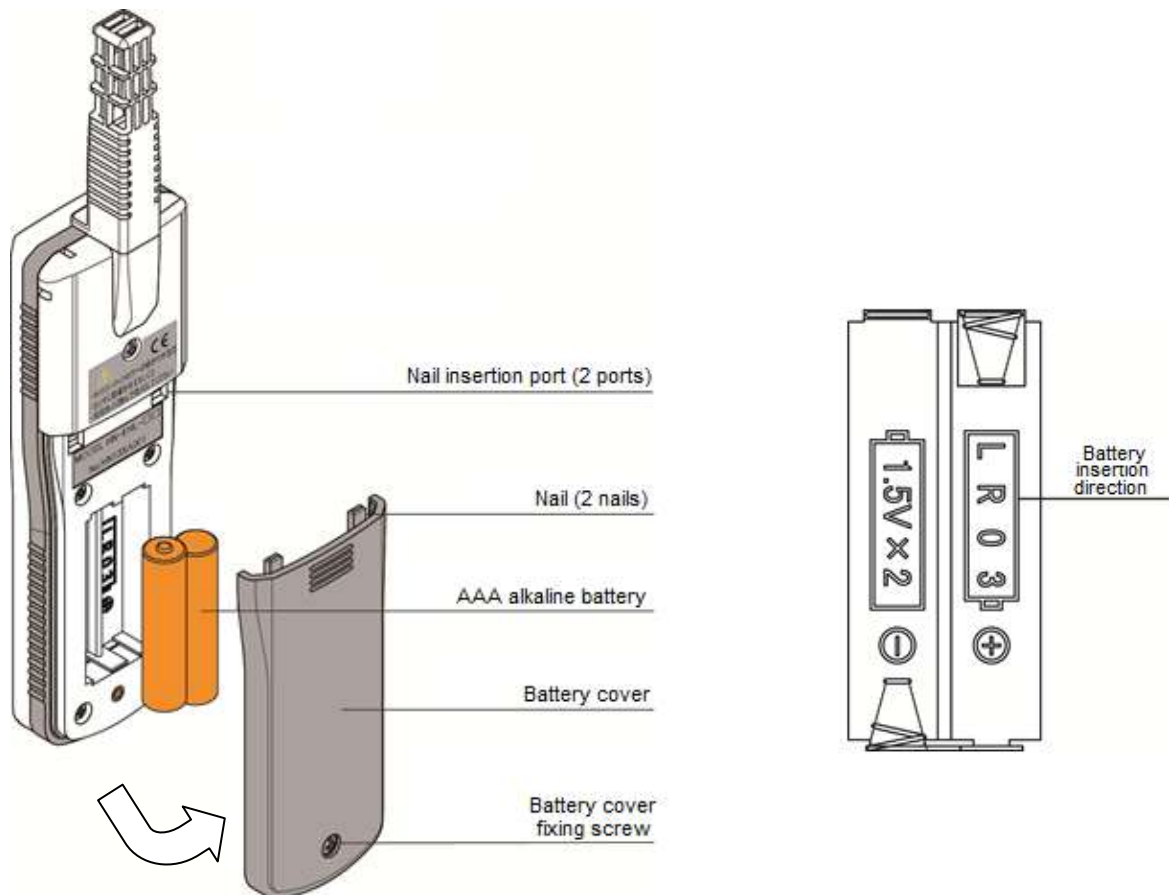


6. LCD



Indications with * (asterisk) mark are not displayed for HN-EHBN (BASIC type).
Unit conversion of humidity is not available either.

7. Loading and Replacement of Batteries



[How to load battery]

- (1) Loosen the battery cover fixing screw by screwdriver until the battery cover comes off.
- (2) Put the battery cover on an angle, pull up and remove, then open the battery insertion part.
- (3) There is a mark to indicate the battery insertion direction on the backside of body, insert 2 pcs of AAA alkaline batteries according to the mark.
- (4) Hook the nails on the battery cover to the nail insertion ports and put the battery cover back.
- (5) Fix the battery cover by tightening a screw with screwdriver.

⚠ Caution

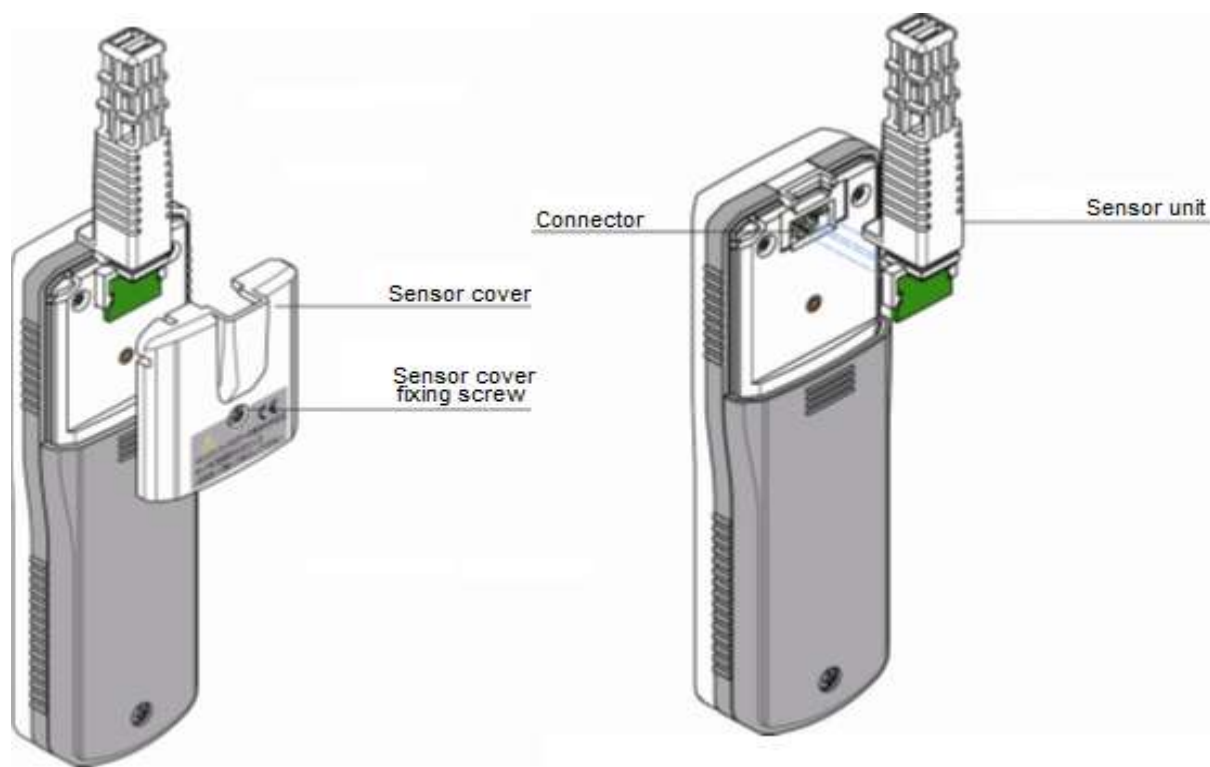
- Be careful not to get wet into the product when you remove the battery cover.
- Definitely put the battery cover according to the above procedures.
- Use 2 pcs of new AAA alkaline batteries when you change.
- Do not remove the battery cover fixing screw from the battery cover.

8. Installing and Replacement of Sensor

■ There is a life to sensor.

This meter can be used again by sensor unit replacement if you have any troubles described in troubleshooting.

Model of sensor unit replacement (sold separately): HN-EH9N
(for HN-EHBN, HN-EHSN)



[How to replace sensor]

- (1) Loosen the battery cover fixing screw by screwdriver until the battery cover comes off.
- (2) Pull up the sensor cover vertically and remove it.
- (3) Pull up the sensor unit vertically and remove it.
- (4) Insert a new sensor unit until the connector is locked.
- (5) Fix the battery cover by tightening a screw with screwdriver.

⚠ Caution

- Pay attention not to force open sensor cover and sensor unit.
- Handle with care. Printed circuit board (green board located inside) is fragile.
- Do not touch the Printed circuit board (green board located inside) by wet hands.
- Do not remove the sensor cover fixing screw from the sensor cover.
- You cannot replace the sensor of HN-EHSP/STANDARD type II.
Please contact your distributor or your nearest CHINO's office.

9. How to Use Sensor Protection Cover, Confirm Model Code and Place Neck Strap

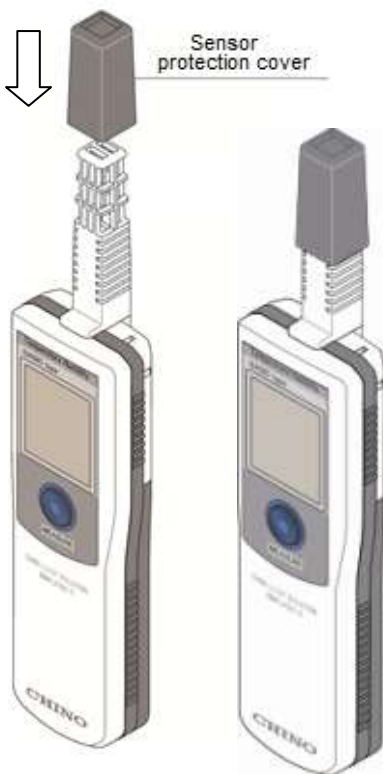


Figure 1

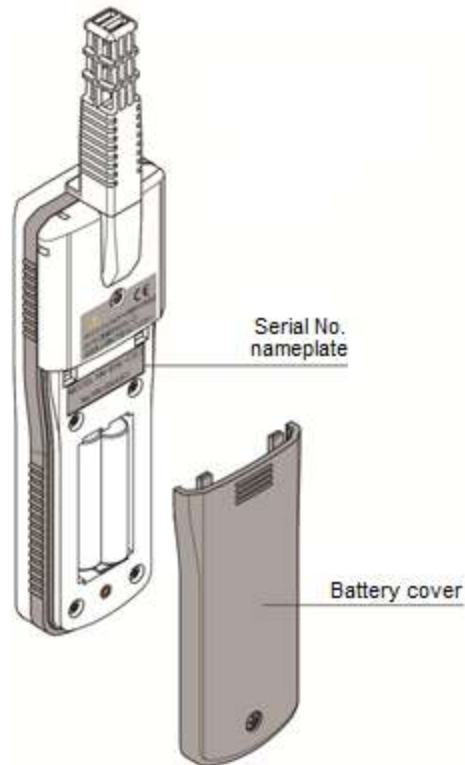


Figure 2

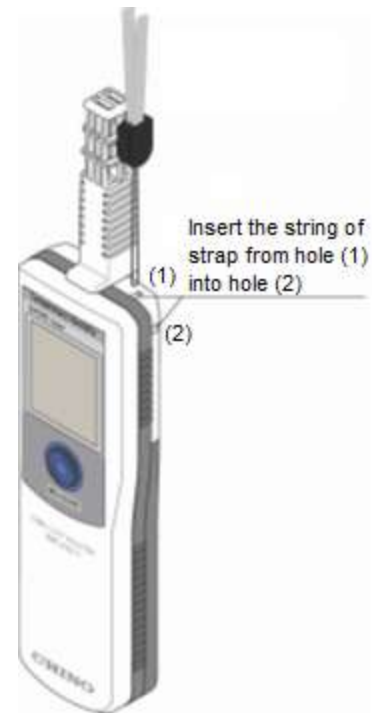


Figure 3

■ How to use sensor cover

- This sensor is precision and vulnerable to shock. It may be affected by dust to measure. To prevent it, put on the sensor protection cover and store this meter while not in use. (Refer to Figure 1)

⚠ Caution

- Take the sensor protection cover off when you use this meter. If not, it may affect an accurate measurement and response.
- The sensor may be broken by strong impact such as dropping even with the sensor protection cover. Never give a shock.
- It is unable to protect from toxic substances such as chemical substances even with the sensor protection cover.

■ How to confirm model code

- Remove the battery cover, there is a serial No. nameplate on the body. Refer to "Model code" and "Serial No." on it if it is necessary to confirm. (Refer to Figure 2)

■ How to place neck strap

- Insert the string of neck strap from hole (1) into hole (2). (Refer to Figure 3)
- * Neck strap is not included in a package.

⚠ Caution

- Do not place neck strap around your neck because it may cause an accident. (Choking hazard)
- Neck strap may come off if it is strongly pull.

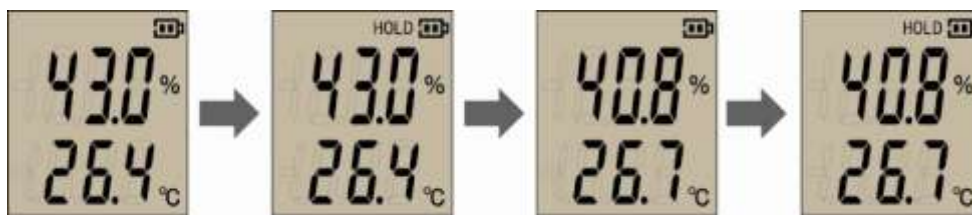
10. Key Operation and Indication Function

HN-EHBN/BASIC type

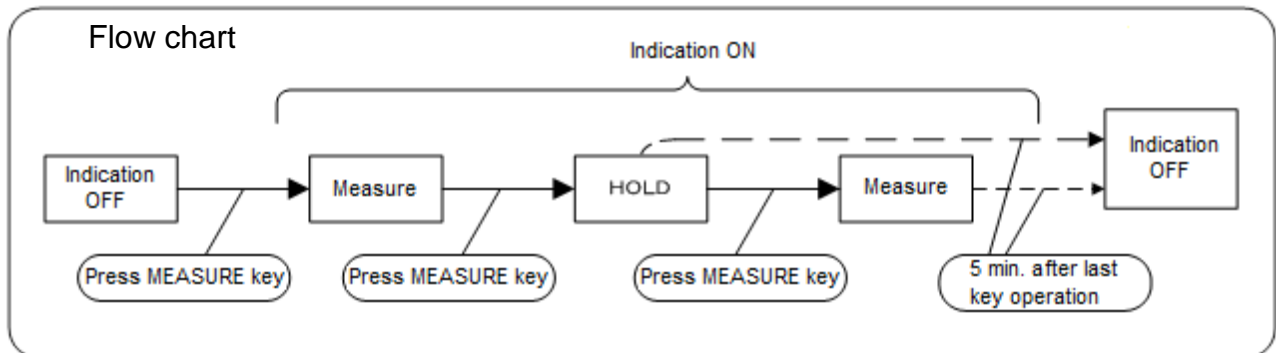
■ Operation of MEASURE key

- (1) When MEASURE key is pressed, indications are displayed and it starts measuring.
- (2) When MEASURE key is pressed while measuring, measuring value is to be "HOLD".
- (3) When MEASURE key is pressed while in "HOLD" state, it returns to the measuring state.

From onward, each time MEASURE key is pressed, it repeats and displays measuring and measuring value hold.



Measuring state Measuring value is hold Measuring state Measuring value is hold



■ Auto Power OFF

5 min after the last operation, Auto Power Off function is activated and display is turned off.

**HN-EHSN/STANDARD type I (Built-in)
HN-EHSP/STANDARD type II (Probe)**

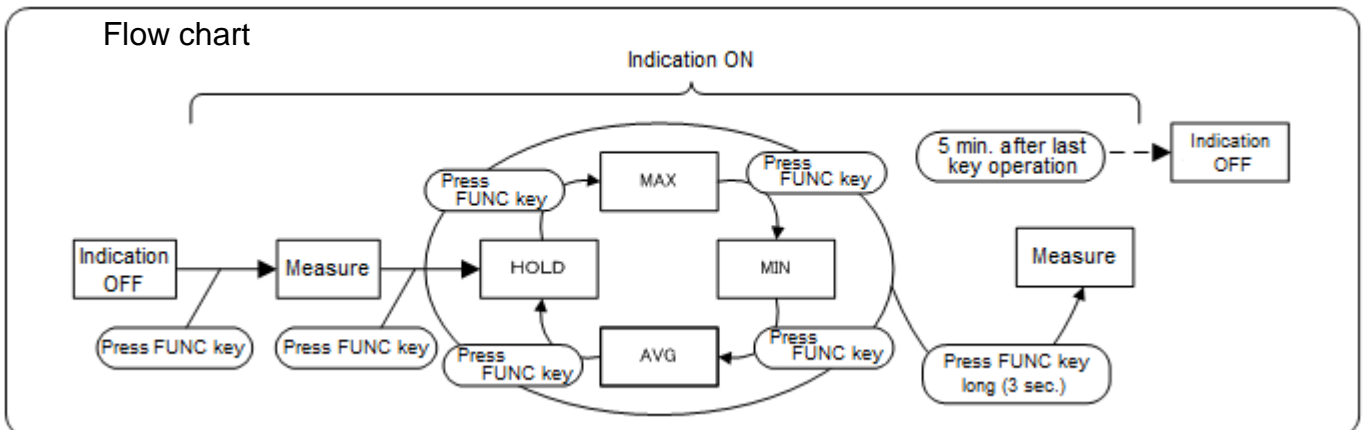
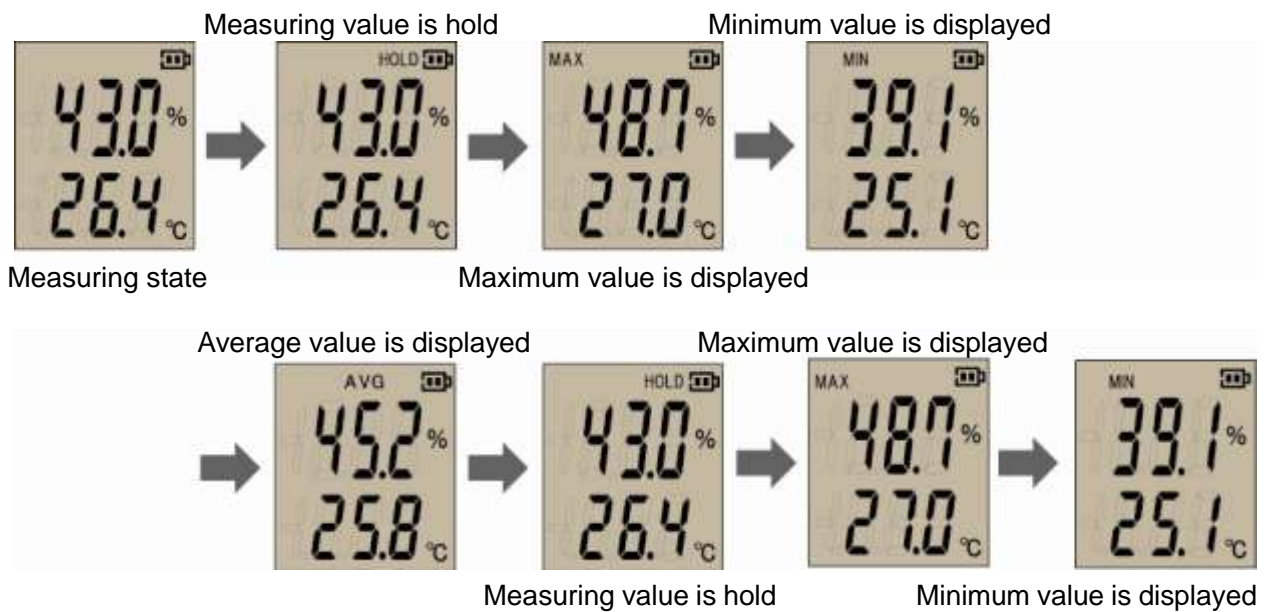
■ Operation of FUNC key

- (1) When FUNC key is pressed, indications are displayed and it starts measuring.
- (2) When FUNC key is pressed while measuring, measuring value is to be "HOLD"

Following maximum value "MAX", minimum value "MIN" and average value "AVG" are of data 10 sec prior to the "HOLD".

- (3) When FUNC key is pressed while in "HOLD" state, it displays maximum value "MAX".
 - (4) When FUNC key is pressed while in "MAX" state, it displays minimum value "MIN".
 - (5) When FUNC key is pressed while in "MIN" state, it displays average value "AVG".
 - (6) When FUNC key is pressed while in "AVG" state, it returns to "HOLD" state.
- From onward, each time FUNC key is pressed, it repeats and displays (3) to (6).

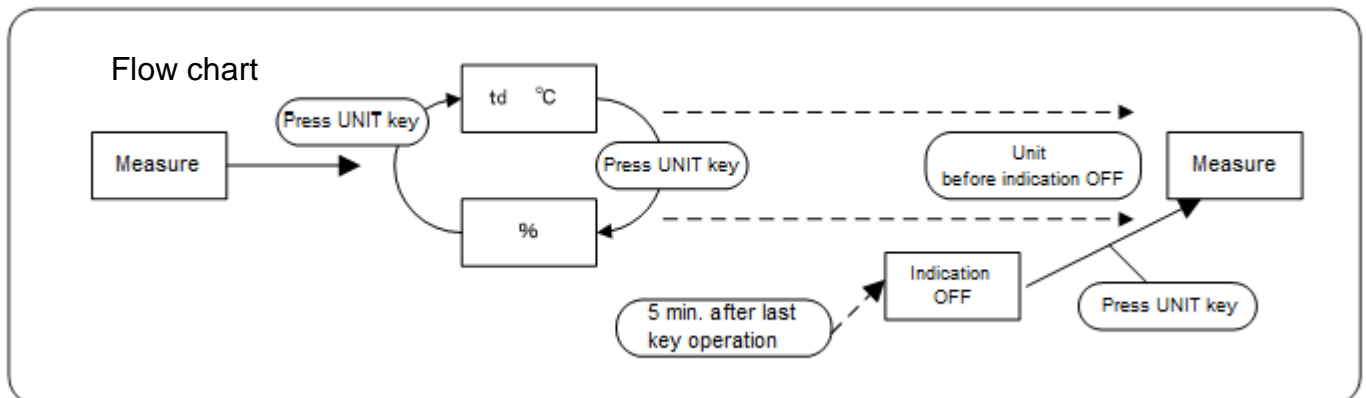
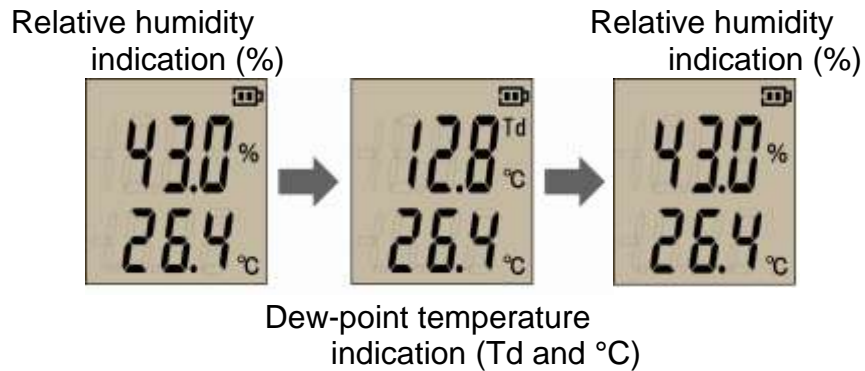
*To return to the measuring state while in HOLD, MAX, MIN or AVG state, press the FUNC key for more than 3 min.



Switch to dew-point temperature indication (only for STANDARD type)

■ Operation of UNIT key

- (1) When UNIT key is pressed, relative humidity indication (%) is switched to dew-point temperature indication (Td and °C).
 - (2) When UNIT key is pressed while in the dew-point temperature indication (Td and °C), it switches to the relative humidity indication (%).
- From onward, each time UNIT key is pressed, it switches the relative humidity indication and the dew-point temperature indication



*FUNC key operation is same as it is in relative humidity indication, if it is in dew-point temperature operation.

*If HOLD, MAX, MIN or AVG is displayed, switching of relative humidity indication and dew-point temperature indication is impossible.







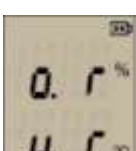
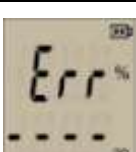

Press FUNC key for 3 sec or more to return to the measuring state.

■ Auto Power OFF

5 min after the last operation, Auto Power Off function is activated and display is turned off.

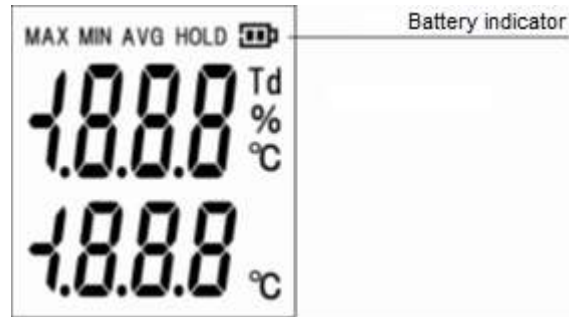
11. Description of Indication





■ Measuring and various function indications, error indication

| Indication | Function Description |
|---|--|
|  | Top unit indication is “%” It indicates relative humidity measuring state. |
|  | “HOLD” keeps measured value. |
|  | “MAX” indicates maximum value of data prior to 10 sec. (only for STANDARD type) |
|  | “MIN” indicates minimum value of data prior to 10 sec. (only for STANDARD type) |
|  | “AVG” indicates average value of data prior to 10 sec. (only for STANDARD type) |
|  | Top unit indication is “Td”+“°C” It indicates dew-point temperature measuring state. (only for STANDARD type) |
|  | “o.r” : Over range, “u.r” : under range It is displayed when measuring value is upper limit or more, or lower limit or less. (refer to troubleshooting) |
|  | Communication error is displayed when the communication between measuring and display is not established. (refer to troubleshooting) |
|  | It is displayed when other error occurred. (refer to troubleshooting) |

■ Remaining battery indicator

There is a remaining battery indicator on right top of the LCD.
 Replace the battery according to the table below.



| Indication | Description |
|---|---|
|  | Enough remaining battery. |
|  | About 50% of remaining battery. |
|  | Nearly empty. Function will stop. Replace the batteries as soon as possible. |
| Blinking  | No battery. Replace the batteries immediately. |

12. Troubleshooting

| Phenomena | Possible causes | Countermeasures |
|---|--|--|
| Indications are not displayed. | Battery is not loaded correctly. | Load the battery correctly. Refer to the section 7. Loading and Replacement of batteries (P. 7) |
| | Battery is dead. | Replace the batteries. Refer to the section 7. Loading and Replacement of batteries (P. 7) |
| | Dew condensation is occurred on the meter. | Remove the batteries and dry the meter thoroughly. If the indication value is normal compare to proper humidity meter, it is ready to use again. If it does not return to the correct value, possibility of malfunction is high. Contact your distributor or your nearest CHINO's office |
| Indication goes On and Off. | Battery is nearly empty. | Replace the batteries. Refer to the section 7. Loading and Replacement of batteries (P. 7) |
| "Err" is displayed. | Sensor unit is not on the correct position. There is failure such as disconnection. | Check the sensor unit for its position. Refer to the section 8. Installing and Replacement of Sensor (P. 8) Contact your distributor or your nearest CHINO's office |
| "----" is displayed. | Sensor unit is not on the correct position. There is failure such as disconnection. | Check the sensor unit for its position. Refer to the section 8. Installing and Replacement of Sensor (P. 8) Contact your distributor or your nearest CHINO's office |
| Temperature/humidity value is off. | Failure on the sensor. Some abnormality is occurring to the sensor unit. | The sensor is a consumable part, purchase the sensor unit sold separately and replace it. Refer to the section 8. Installing and Replacement of Sensor (P. 8) |
| "o.r" is displayed on the relative humidity indication. | Dew condensation is occurred on the sensor. | Remove the batteries and dry the meter thoroughly. If the indication value is normal compare to proper humidity meter, it is ready to use again. If it does not return to the correct value, possibility of malfunction is high. The sensor is a consumable part, purchase the sensor unit sold separately and replace it. Refer to the section 8. Installing and Replacement of Sensor (P. 8) |
| | Failure on the humidity sensor. | Dry the meter thoroughly. If the indication value is remained "o.r.", possibility of malfunction is high. The sensor is a consumable part, purchase the sensor unit sold separately and replace it. Refer to the section 8. Installing and Replacement of Sensor (P. 8) |
| "u.r" is displayed on the temperature indication. | Failure (disconnection etc.) on the temperature sensor. | The sensor is a consumable part, purchase the sensor unit sold separately and replace it. Refer to the section 8. Installing and Replacement of Sensor (P. 8) |
| "o.r" is displayed on the temperature indication. | Failure (short etc.) on the temperature sensor. | The sensor is a consumable part, purchase the sensor unit sold separately and replace it. Refer to the section 8. Installing and Replacement of Sensor (P. 8) |
| Indication value of the temperature and dew-point temperature is same. (only for the STANDARD type) | Failure on the humidity sensor. | There is a possibility of failure on the humidity sensor. The sensor is a consumable part, purchase the sensor unit sold separately and replace it. Refer to the section 8. Installing and Replacement of Sensor (P. 8) |
| Indication value does not change. | It is in the "HOLD" state. | BASIC type Press the MEASURE key. STANDARD type Press the FUNC key for 3 sec. or more. |
| Indication value is unstable. | The meter is under the influence of strong static electricity, electromagnetic wave or high frequency. | Keep distance from devices which generate strong static electricity, electromagnetic wave or high frequency. |
| | Measuring atmosphere itself is unstable. | Perform measurement under the stable environment. |
| | Failure on the sensor. | The sensor is a consumable part, purchase the sensor unit sold separately and replace it. Refer to the section 8. Installing and Replacement of Sensor (P. 8) |

13. Specifications

Common specifications

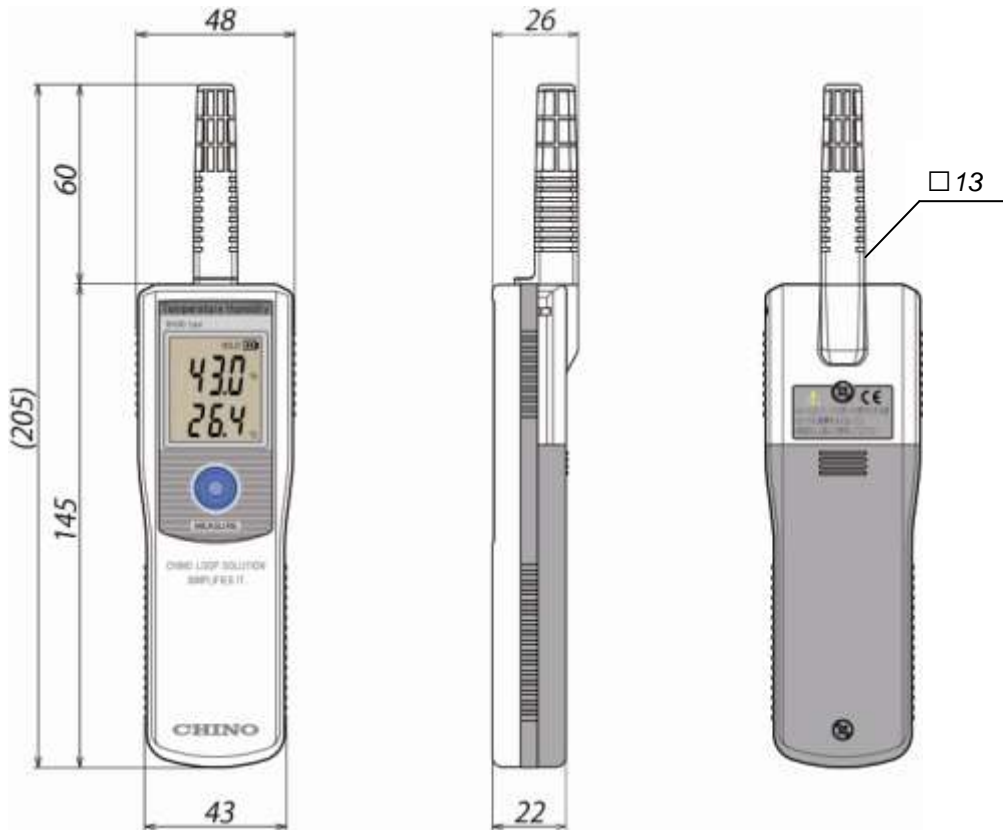
| Items | Contents |
|---------------------|---|
| Storage conditions | -20°C to 60°C, 90%RH or less (no dew condensation) |
| Power | AAA alkaline battery, 2pcs |
| Batter life | About 500 hours (at 25°C, depending on battery) |
| Standards conformed | CE marking: EN61326-1/Class B Stability under EMC test environment Temperature $\pm 0.5^{\circ}\text{C}$ or less Humidity $\pm 2.5\% \text{RH}$ (at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$) Dew point temperature $\pm 2.0^{\circ}\text{C}$ or less (at 25°C , 50%RH) |
| Display | LCD Indication update period 1 sec |
| Auto-power-off time | 5 min after last key operation |
| Main material | ABS resin (antibacterial specification) Color: DIC equivalent of G-257 |
| Sensors | Temperature: thermistor Humidity: high polymer capacitance |

Individual specifications

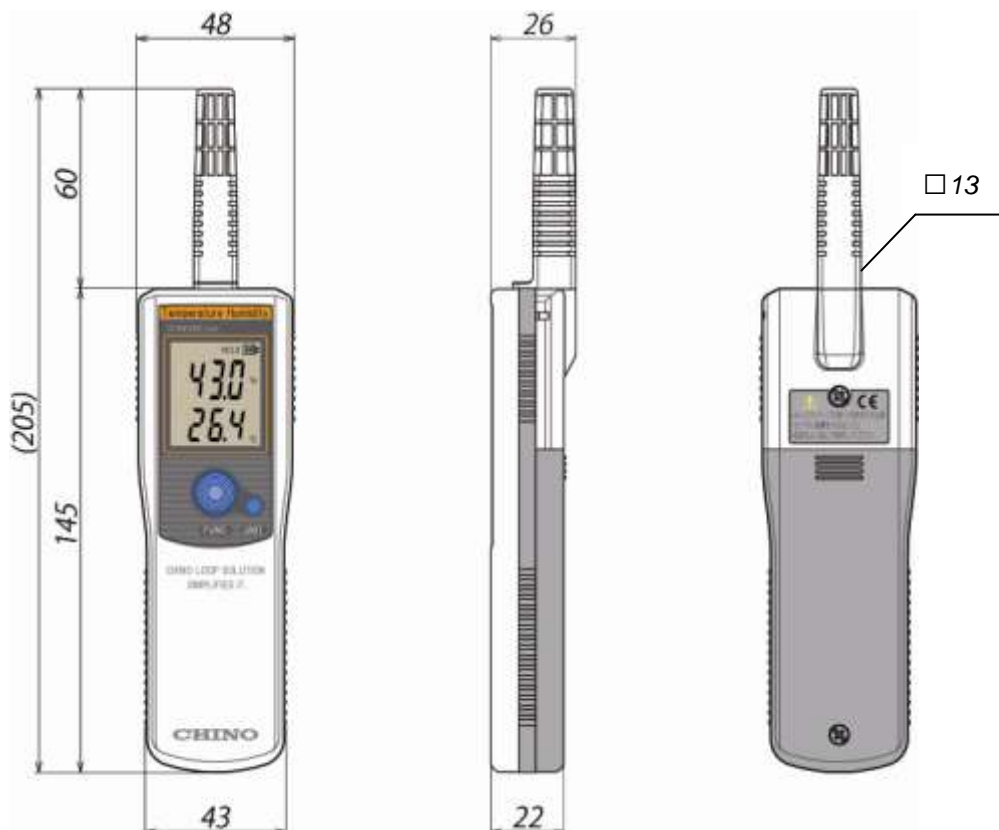
| Items | | HN-EHBN (BASIC type) | HN-EHSN (STANDARD type/Probe) |
|---|-----------------------|---|--|
| | | HN-EHSN (STANDARD type/Built-in) | |
| Working conditions | Body | -10 to 45°C | -10 to 45°C |
| | Sensor | — | - 20 to 70°C |
| Measuring range | Temperature | -10 to 45°C | - 20 to 70°C |
| | Relative humidity | 5 to 95%RH (no dew condensation) | |
| | Dew point temperature | -35 to 55°C *STANDARD type only | |
| Measurement resolution | Temperature | 0.1°C | |
| | Relative humidity | 0.1%RH | |
| | Dew point temperature | 0.1°C | |
| Accuracy ratings | Temperature | $\pm 0.5^{\circ}\text{C} \pm 1$ digit (5 to 45°C) | $\pm 0.5^{\circ}\text{C} \pm 1$ digit (5 to 45°C) |
| | | $\pm 1.0^{\circ}\text{C} \pm 1$ digit (-10 to 5°C) | $\pm 1.0^{\circ}\text{C} \pm 1$ digit (-10 to 5°C, 45 to 70°C) |
| | Relative humidity | $\pm 2.5\% \text{RH} \pm 1$ digit (5 to 90%RH, at 25°C) | |
| | | $\pm 3.5\% \text{RH} \pm 1$ digit (90 to 95%RH, at 25°C) | |
| Response | Temperature | 40 sec or less (90% step response: under 0.5m/s ventilation) | |
| | Relative humidity | 40 sec or less (90% step response: 25°C, under 0.1m/s ventilation) | |
| Temperature dependence of relative humidity measurement | | $\pm 0.1\% \text{RH}/^{\circ}\text{C}$ (fluctuation at 25°C, 50%RH, measuring value) | |
| Dimensions | | W48 x H205 x D26 | W48 x H147 x D26 (body) Cable length 1350mm |
| Weight | | 92g (excluding batteries) | 130g (excluding batteries) |

14. External Dimensions

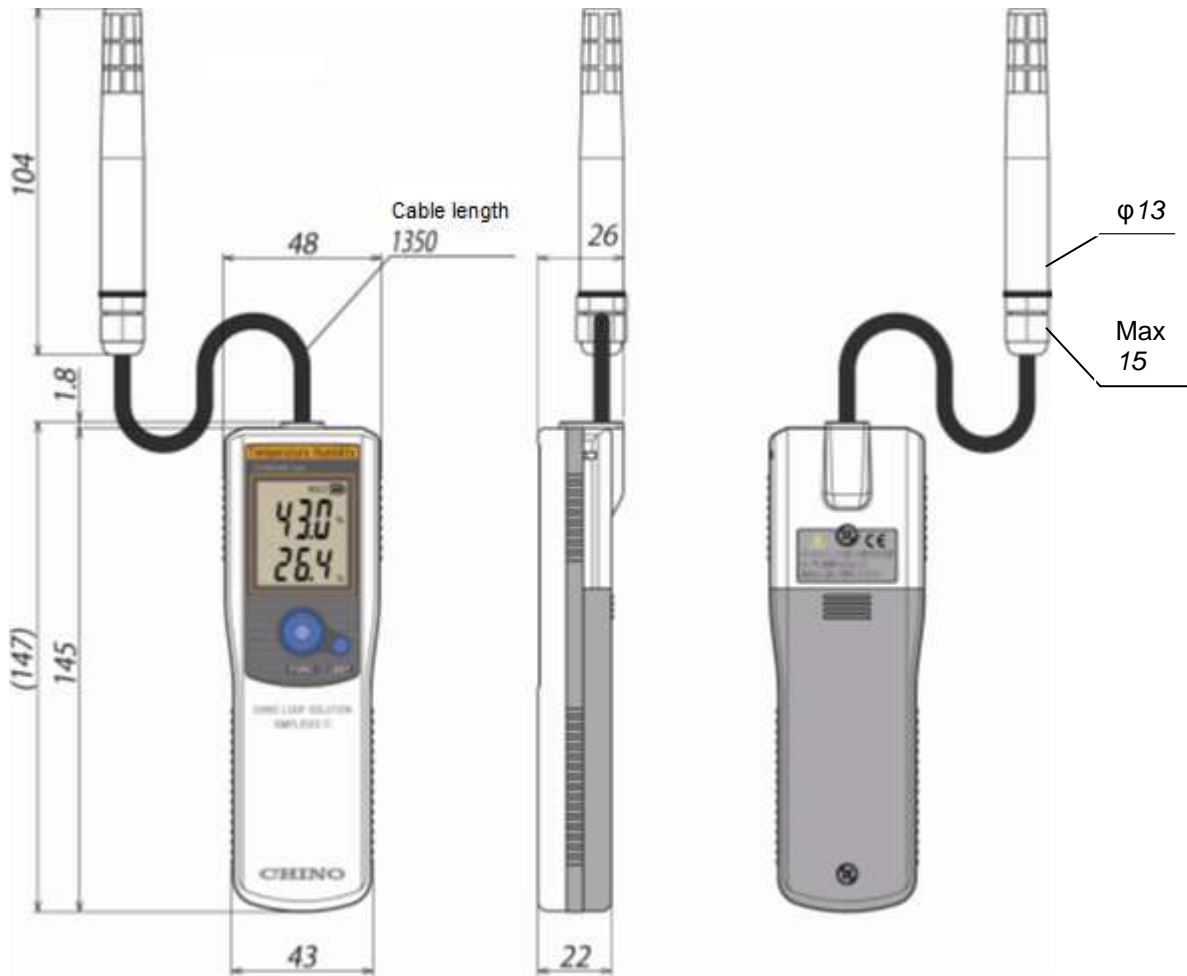
HN-EHBN/BASIC type



HN-EHSN/STANDARD type I (Built-in)



HN-EHSP/STANDARD type II (Probe)



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