



Thank you for purchasing our Humidity Detector HD-500-V. This manual contains instructions for installation and handling of the HD-500-V. To ensure safe and correct use, thoroughly read and understand this manual before using this instrument. To prevent accidents arising from the misuse of this instrument, please ensure the operator receives this manual.


## Notes

- This instrument should be used in accordance with the specifications described in the manual. If it is not used according to the specifications, it may malfunction or break.
- Be sure to follow the warnings, cautions and notices. If they are not observed, serious injury or malfunction may occur.
- The contents of this instruction manual are subject to change without notice.
- Care has been taken to ensure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- Shinko Technos Co., Ltd. is not liable for any damage or secondary damage(s) incurred as a result of using this product, including any indirect damage.

## Safety Precautions (Be sure to read these precautions before using our products.)

The safety precautions are classified into categories: "Warning" and "Caution". Depending on circumstances, procedures indicated by  Caution may result in serious consequences, so be sure to follow the directions for usage.

 **Warning** Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

 **Caution** Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

### **Warning**

- To prevent an electrical shock or fire, only Shinko or other qualified service personnel may handle the inner assembly.
- To prevent an electrical shock, fire or damage to the instrument, parts replacement may only be undertaken by Shinko or other qualified service personnel.

### **SAFETY PRECAUTIONS**

- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after purpose-of-use consultation with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices such as protective equipment against excessive temperature rise, etc. must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Proper periodic maintenance is also required.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

### **Caution with Respect to Export Trade Control Ordinance**

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument. In the case of resale, ensure that this instrument is not illegally exported.



# Caution

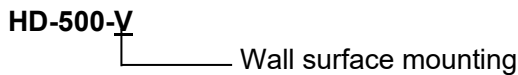
- Never disassemble, modify or repair the HD-500 for user's safety. The HD-500 which is disassembled by users is exempted from warranty.
- Do not drop, strike or press hard on it. It will break or malfunction.

Ensure the mounting location corresponds to the following conditions:

- A minimum of dust, and an absence of corrosive gases
- No acid, alkali, organic solvent, flammable, explosive gases
- No mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of 0 to 50°C (32 to 122°F) that does not change rapidly
- Low humidity (90 %RH or less) and without constant condensation
- No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil, chemicals or the vapors of these substances can come into direct contact with the unit

## 1. Model

### 1.1 Model

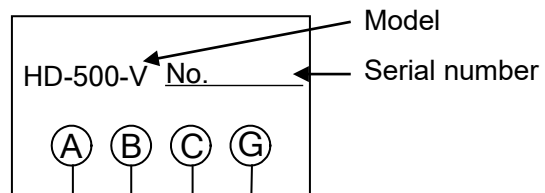


### 1.2 Model Label Indication

- Label on the terminal box cover
- Terminal label (inside the terminal box)

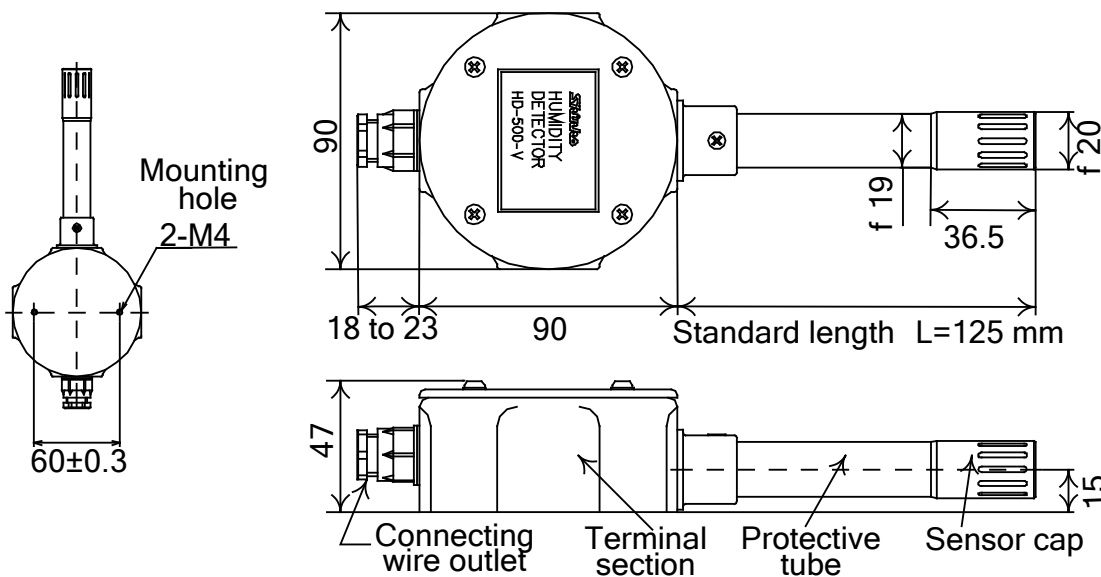


(Fig. 1.2-1)



(Fig. 1.2-2)

## 2. Name of Sections, External Dimensions (Scale: mm)



(Fig. 2-1)

# 3. Mounting

## 3.1 Mounting Environment

Mount the HD-500 in a location where no corrosive gases are present, where airflow is not stagnant, and where average humidity can be detected.

**(If you have any questions regarding mounting environment, please contact us.)**

- In an environment of corrosive gases, degradation of the humidity sensor will be quickened, and it will cause measurement errors. Avoid mounting in a location where the following gases are present:  
Chlorine gas, Hydrogen chloride gas, Sulfur dioxide gas, Carbon dioxide gas, Nitric acid gas, Ammonia gas, Ethanol gas, Methanol gas, Cigarette smoke, etc.
- No water, oil, chemicals or their vapors come into direct contact with the instrument.
- A minimum of dust
- No exposure to direct sunlight, an ambient temperature of 0 to 50°C (32 to 122°F) that does not change rapidly
- No mechanical vibrations or shocks
- Mount the unit in a location where its operating humidity range is within 20 to 90 %RH.  
Use the water-proof filter (THF-500, sold separately) in an environment where dew condensation occurs because the sensor degradation will be quickened.
- The wire connecting the HD-500 to the “instrument to receive humidity” should be kept away from large capacity electromagnetic switches or cables through which large current is flowing.

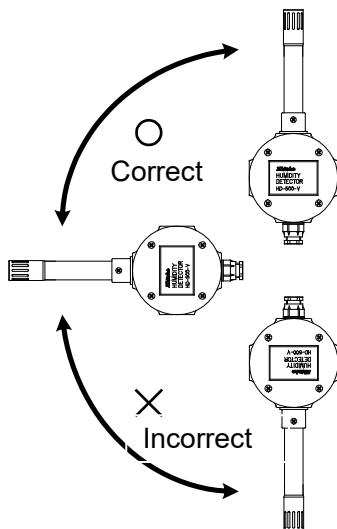
## 3.2 Mounting Method

(1) Mount the HD-500 within a range of 90 degrees (between horizontal and upright). Otherwise water will enter through the gap between the sensor cap and the protective tube, and this will cause sensor malfunction. (Fig.3.2-1)

Mount the protective tube perpendicularly placed to airflow, and keep the HD-500 50 mm or more of distance from the wall. However, be careful about mounting direction of the humidity sensor HD-S2. See (Fig. 3.2-2) on p.4.

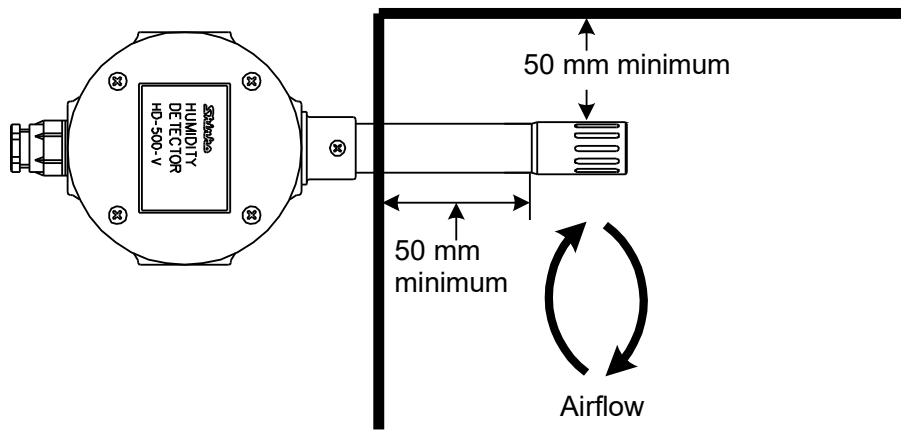
- (2) Securely mount the HD-500 using the provided screws after opening the terminal box cover.
- (3) After connecting the wire to the terminal, securely fix the moisture protection connector of the connecting wire outlet and rubber packing for terminal box cover. Otherwise, terminal parts will be corroded and a measurement error will result.

**Use the water-proof filter (THF-500, sold separately) in an environment where dew condensation occurs.**



(Fig. 3.2-1)

● Mounting example



(Fig. 3.2-2)

# 4. Wiring



## Warning

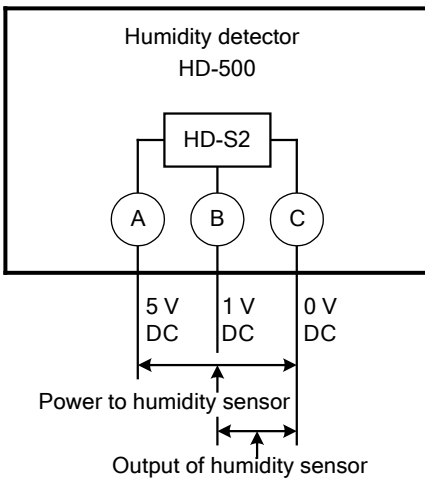
Turn the power supply to the HD-500 OFF before wiring or checking. Working on or touching the terminal with the power switched ON may result in severe injury or death due to electrical shock.



## Caution

- When wiring the terminals of the HD-500, use a solderless terminal with an insulation sleeve in which an M3 screw fits. Turn the power supply to the HD-500 OFF before wiring.
- Tighten the terminal screw (M3) using the specified torque. If it is tightened with excessive torque, the terminal screw (M3) may be damaged.
- The connecting wire (0 to 1 V DC) from the HD-500 should be kept away from other power lines and load lines.

### 4.1 Terminal Arrangement



- A: Power supply to the humidity sensor 5 V DC (+)
- B: Output of the humidity sensor  
0 to 1 V DC (corresponds to 0 to 100 %RH.) (+)
- C: Humidity output, common power source (-)

(Fig 4.1-1)

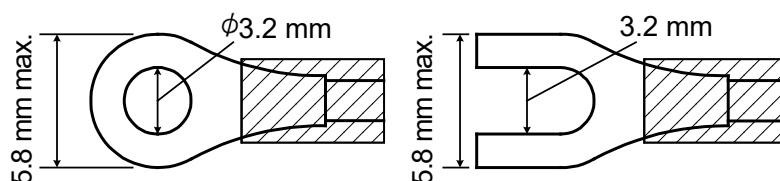
#### ● Connecting wire outlet

Pass the connecting wire(s) through the moisture protection connector of the connecting wire outlet, and fasten tightly after connecting the wire(s) to the HD-500 terminals.

#### ● Lead wire solderless terminal

Use a solderless terminal with an insulation sleeve in which an M3 screw fits as shown below. The torque should be 0.63 N•m.

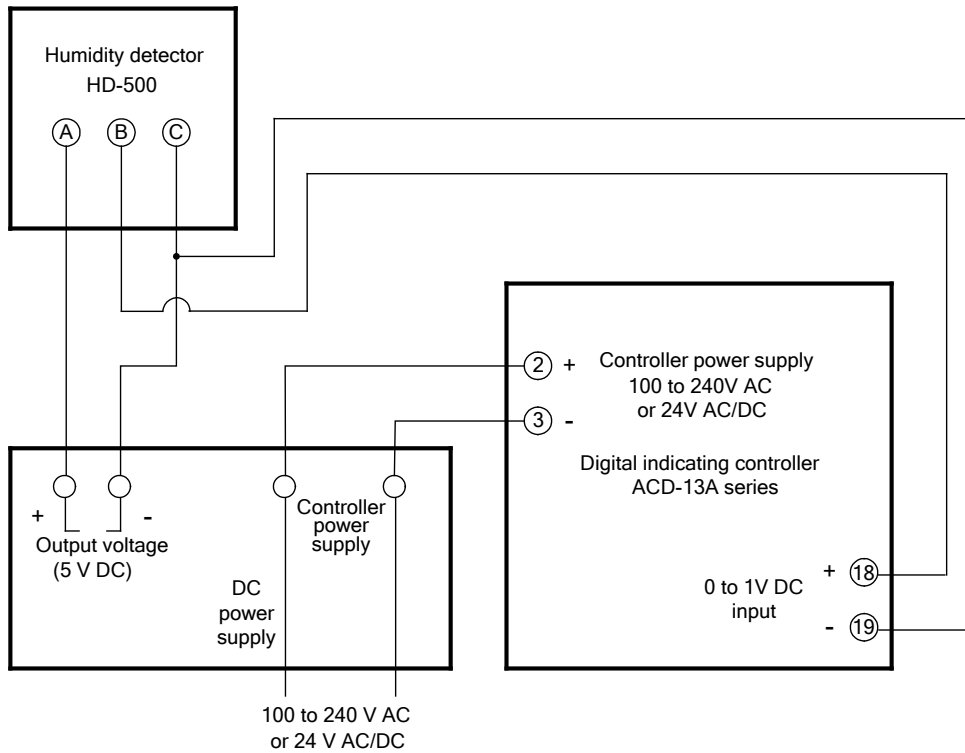
Solderless Terminal	Manufacturer	Model	Tightening Torque
Y-type	Nichifu Terminal Industries CO.,LTD.	TMEV1.25Y-3	0.63 N•m
	Japan Solderless Terminal MFG CO.,LTD.	VD1.25-B3A	
Ring-type	Nichifu Terminal Industries CO.,LTD.	TMEV1.25-3	
	Japan Solderless Terminal MFG CO.,LTD.	V1.25-3	



(Fig. 4.1-2)

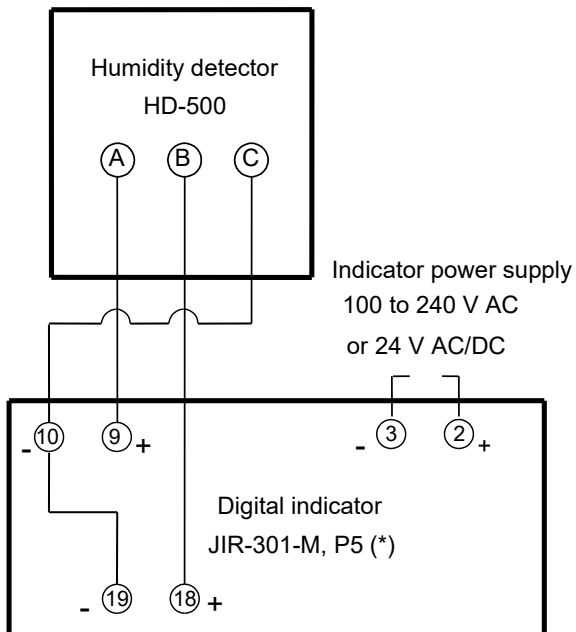
## 4.2 Wiring Example

### ● Humidity control using the DC power supply



(Fig 4.2-1)

### ● Humidity monitoring using the digital indicator



(\*) The P5 option (5V DC power supply to the humidity sensor) has been applied to the JIR-301-M.

(Fig 4.2-2)

### 4.3 Procedure for Humidity Sensor Replacement

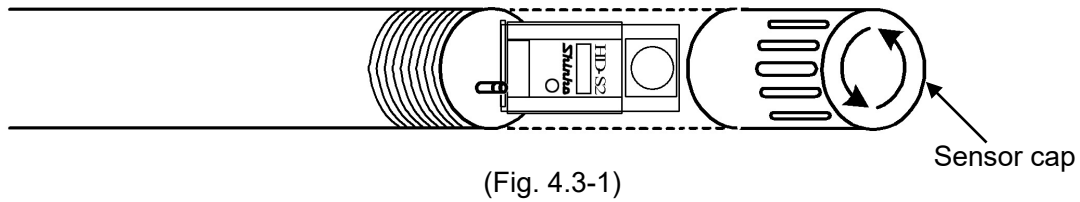


## Caution

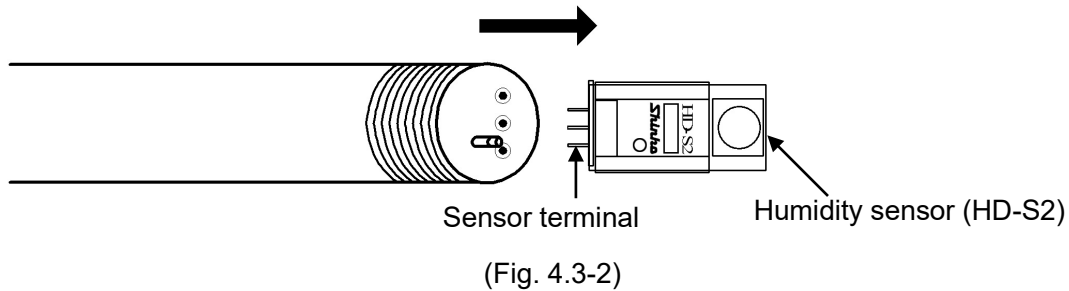
- Do not use any humidity sensors except HD-S2.
- Keep the socket and sensor terminals clean.  
If they are not clean, correct measurement is impossible due to imperfect contact.
- Do not apply excessive force to the sensor, and do not touch the sensor with wet hands or with chemicals on them.
- Do not clean the sensor.

#### ● Replacement of the humidity sensor

(1) Unscrew the sensor cap of the HD-500 counterclockwise, and pull it out straightly.

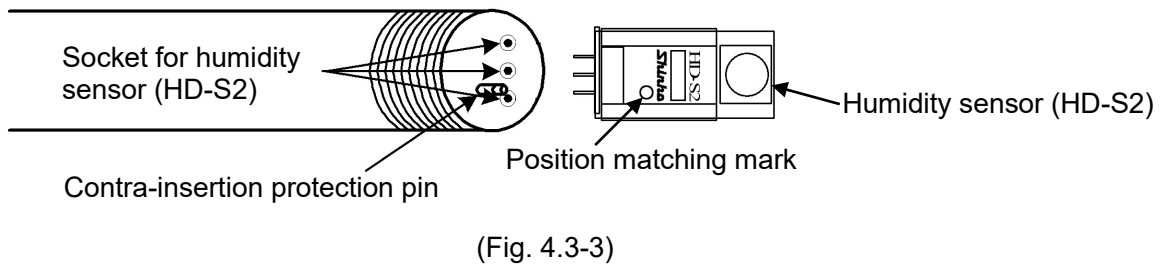


(2) Pull, straightly, the degraded humidity sensor (HD-S2) out of the socket.

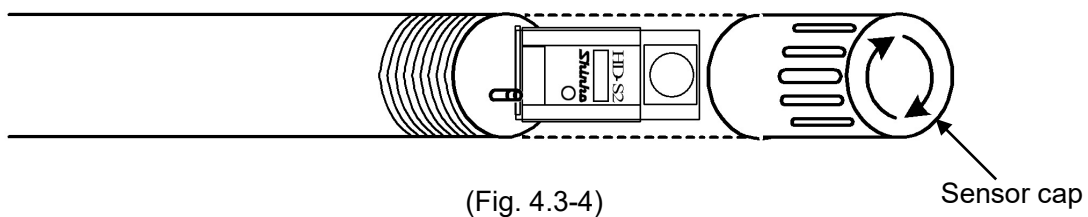


(3) Set the new sensor (HD-S2) in the socket straightly.

The humidity sensor (HD-S2) has polarity. Therefore, fit the contra-insertion protection pin and the position matching mark ● on the humidity sensor.



(4) Insert the HD-500 sensor cap straightly, and screw it clockwise for mounting.



# 5. Specification

## 5.1 Standard Specification

Measuring range	5 to 90 %RH
Measuring method	Electrostatic capacity variation type
Accuracy	Within $\pm 3$ %RH (Within the range of 20 to 80 %RH at 15 to 55°C) Within $\pm 4$ %RH (Within the range of 20 to 80 %RH at 0 to 65°C) Within $\pm 5$ %RH (Within the range of 0 to 100 %RH at 5 to 45°C) Within $\pm 6$ %RH (Within the range of 20 to 80 %RH at 65 to 75°C) Within $\pm 8$ %RH (Within the range of 0 to 100 %RH at 0 to 80°C)
Response characteristics	Approx. 20 seconds [Time to reach 90% of 30 $\longleftrightarrow$ 80 %RH] However, air flow 5 l/min (0.16 m/s) (When water-proof filter is mounted to the sensor chip section)
Hysteresis	Approx. 0 %RH (stability time, 20 minutes)
Output	0 to 1 V DC (Linearly corresponds to 0 to 100 %RH)
Material	Case: Steel sheet zinc plated, Color: Metallic silver coating Protective tube: SUS304 Sensor cap: Polyacetal, Color: Black
External dimensions	Refer to Section "2. Name of Sections, External Dimensions".
Operating environment	Temperature: 0 to 50°C Humidity: 20 to 90 %RH (non-condensing)
Storage environment	Temperature: -20 to 60°C Humidity: 5 to 90 %RH (non-condensing)
Supply voltage	5 V DC
Mounting	Wall surface mounting
Weight	Approx. 450 g
Accessories	Instruction manual: 1 copy Fixing screws (Material BS) MN $\oplus$ 4 x 10 mm: 2 pieces Washers (Material BS) WB-4: 2 pieces



## 5.2 Supplementary

- **Protective tube**

L=125 mm (Standard specification)

The length can be extended in units of 50 mm fixed length (from 125 mm).

- **Connecting wire (L□)**

Wire length (Scale: m)

The connecting wire will be connected to the HD-500 when shipped.

Connecting wire can be extended in units of 1 m fixed length

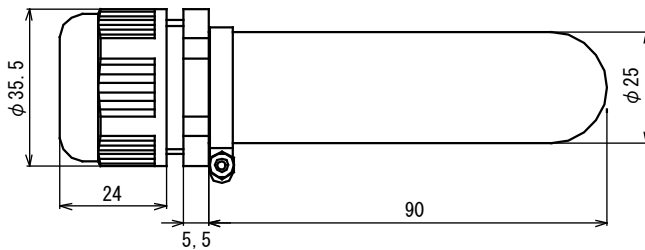
(e.g.) If "L5" is specified: Connecting wire of 5 m will be connected to the HD-500 when shipped.

- **Water-Proof Filter**

Model: THF-500

Material: Fluoride resin (Water or dust cannot pass through, and hard to clog.)

External dimensions (Scale: mm)



(Fig. 5.2-1)

## 5.3 Sensor for Replacement

### Humidity sensor

Model: HD-S2

Interchangeable.

Adjustment is not required after replacement.

## 6. Troubleshooting

The life of a sensor varies depending on the operating environment. To maintain accuracy, checking or replacement of sensors are required at least once a year.

Check if the humidity sensor (HD-S2) is securely set in the socket before checking the following.

Problem	Possible Cause	Solution
No output from the HD-500	Check if wiring in the HD-500 is correct.	Wire them correctly.
	Check if the sensor contact is perfect.	Replace the sensor if sensor terminals are corroded. Replace the socket if its contact is corroded. (Please request repair from us.)
	Check if the sensor is broken.	Replace the sensor.
The instrument to receive humidity shows abnormally high humidity.	Check whether the sensor is wet or condensing.	Dry the sensor.
	Check if inorganic salt, etc. is attached to the sensor.	Replace the sensor.
The instrument to receive humidity shows abnormally low humidity.	Check whether the sensor is dusty.	Replace the sensor.
	Check whether the sensor is degraded due to frequent condensation.	Replace the sensor.
Response of the "instrument to receive humidity" is slow.	Check the mounting location of the HD-500 and the air speed at the location.	Ensure the mounting location is suitable for the HD-500.

For all other malfunctions, please contact our main office or dealers.

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\*\*\*\*\* Inquiries \*\*\*\*\*

For any inquiries about this unit, please contact our agency or the vendor where you purchased the unit after checking the following.

(Example)

Model ----- HD-500-V

Serial number ----- No. xxxxxx

In addition to the above, please let us know the details of the malfunction, or discrepancy, and the operating conditions.

**SHINKO TECHNOS CO., LTD.**  
**OVERSEAS DIVISION**

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