

# Humidity Sensor ES2-HB      Temperature/Humidity Sensor ES2-THB

**Detect Humidity within an Accuracy of  $\pm 3\%$  in a Compact Body. Controller Set Provides Superior Humidity Control and Temperature/Humidity Control.**

- Employs high-polymer-resistive Sensor with superior durability.
- Compact and lightweight.
- Measurement ranges of 20% to 95% for humidity and 0 to 55°C for temperature.



## Ordering Information

Name	Model
Humidity Sensor	ES2-HB
Temperature/Humidity Sensor	ES2-THB
Humidity Sensor Module (See note.)	ES2-M

**Note:** This is a replacement item. One Module is provided with the ES2-HB/-THB. Always attach the Humidity Sensor Module when using the ES2-HB/-THB. Approximately 7 VDC will be output for the humidity output if the Module is not attached or is incompletely attached.

## Specifications

<b>Humidity Sensor section</b>	High-polymer resistive
<b>Humidity detection range</b>	20 to 95%
<b>Humidity detection accuracy</b>	$\pm 3\%$ (25°C, 40 to 80%)
<b>Power supply voltage</b>	24 VDC (See note 1.)
<b>Operating voltage range</b>	85% to 110% of power supply voltage
<b>Current consumption</b>	10 mA max.
<b>Humidity output</b>	1 to 5 V (for humidity of 0% to 100%) Permissible load impedance: 100 k $\Omega$ min. (Use a 1:1 connection when connecting to an E5□K.)
<b>Temperature Sensor Section (See note 2.)</b>	Platinum resistance thermometer
<b>Temperature detection range</b>	0 to 55°C
<b>Temperature output</b>	Pt100: 3 wire (See note 4.)
<b>Communications cable length</b>	5 m
<b>Operating temperature and humidity range (See note 3.)</b>	0 to 55°C, humidity of 95% max.
<b>Storage temperature and humidity range (See note 3.)</b>	-20 to 60°C, humidity of 95% max.
<b>Degree of protection</b>	IP 20 equivalent
<b>Weight</b>	ES2-HB: Approx. 41 g (excluding cables) ES2-THB: Approx. 43 g (excluding cables)

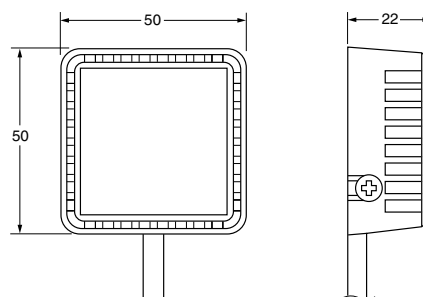
- Note:**
1. The maximum ripple voltage of 2% p-p max.  
The recommended power supply is the OMRON S82K.
  2. ES2-THB only.
  3. Do not use or store the Sensor for an extended period at a humidity of 90% or more.
  4. Pt100 (JIS C 1604-1989) is used for the measuring elements. Set *Pt100* for input sensor type of the Temperature Controller.

## Dimensions

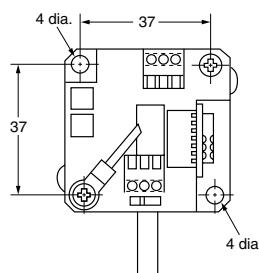
**Note:** All units are in millimeters unless otherwise indicated.

**ES2-HB Humidity Sensor**

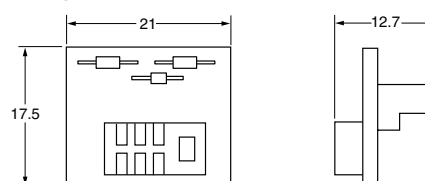
**ES2-THB Temperature/Humidity Sensor**



**Cover**



**ES2-M Humidity Sensor Module**



**Note:** Firmly insert the connector all the way in when mounting the ES2-M to the Sensor.

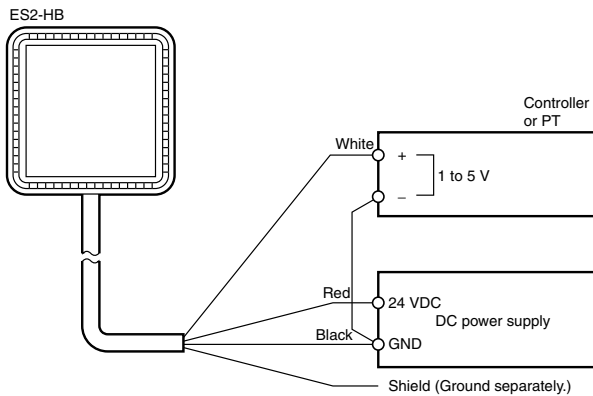
## Precautions for Safe Use

Do not use the product in the following locations:

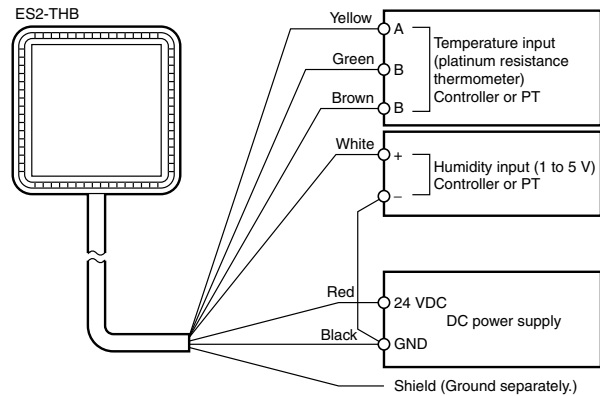
- Locations subject to water splashing or oil contact
- Locations subject to dust or corrosive gases
- Locations subject to icing or condensation
- Locations subject to direct sunlight

## Connection Examples

### ES2-HB Humidity Sensor



### ES2-THB Temperature/Humidity Sensor



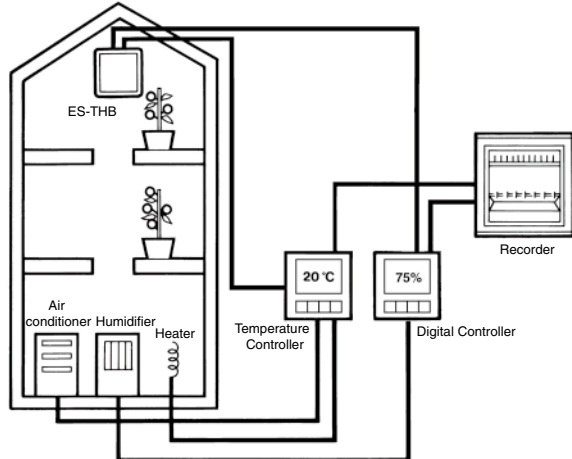
## Cable Conditions

Item	Model	ES2-HB	ES2-THB
Diameter		AWG22	AWG24
Number of conductors		3	6
Shield		Braided	Braided
Maximum conductive resistance (20°C)		60 Ω/km max.	92 Ω/km max.
Finished outer cable diameter		5.5 mm	5.9 mm

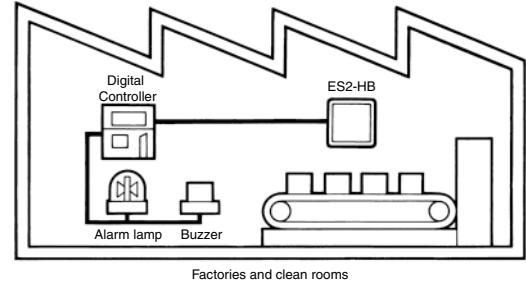
**Note:** Provide a separate cable according to the details listed at the left if the length of the supplied cable is insufficient. The cable can be extended to a maximum of 50 m.

# Application Examples

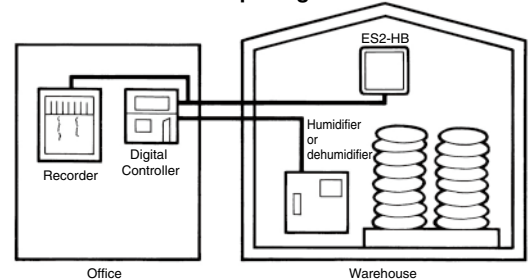
## Temperature and humidity control for vegetable and fruit growing rooms



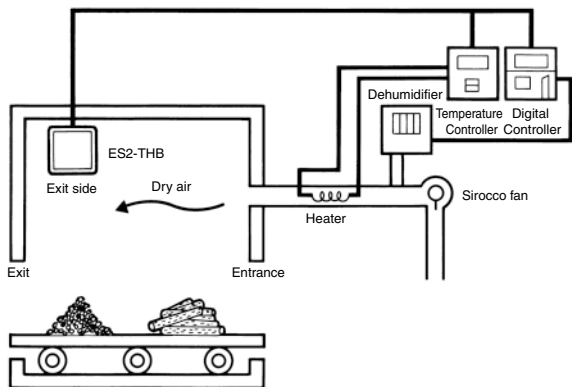
## Monitoring and data collection for clean rooms and storage locations



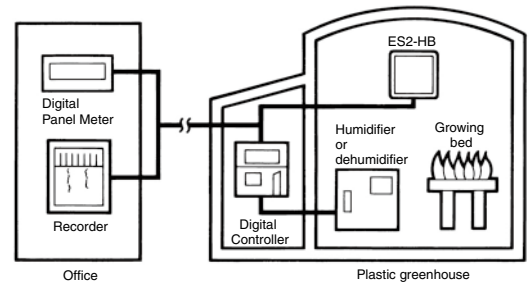
## Humidity control for constant-humidity warehouses and rooms for fermentation or ripening



## Temperature and humidity control for drying



## Humidity control for plant factories and greenhouses



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.

## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

## Warranty and Limitations of Liability

### WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

### LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

## Application Considerations

### SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the product.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

## Disclaimers

### CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the product may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased product.

### DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### ERRORS AND OMISSIONS

The information in this catalog has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

### PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

### PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

### COPYRIGHT AND COPY PERMISSION

This catalog shall not be copied for sales or promotions without permission.

This catalog is protected by copyright and is intended solely for use in conjunction with the product. Please notify us before copying or reproducing this catalog in any manner, for any other purpose. If copying or transmitting this catalog to another, please copy or transmit it in its entirety.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Omron:

[ES2-HB](#) [ES2-M](#) [ES2-THB](#)