HX92B SERIES
Relative Humidity Transmitters

TH-SP short probe with M12 connector

TH-RP remote probe with 3 m (10') cable and M12 connector

HX92B(*)-D duct mount transmitter shown smaller than actual size

Easy M12 Connection

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**WARNING:** These products are not designed for use in, and should not be used for, human applications.

**Patented:** Covered by U.S. and International Patents and Patents Pending.
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Section 1 - General Description

The OMEGA® HX92B Series Relative Humidity Transmitter provides a linearized and temperature compensated output signal of 4 to 20mA, 0 to 1 Vdc, 0 to 5 Vdc or 0 to 10 Vdc depending upon the model selected. The output signals have been calibrated and scaled 0 to 100% Relative Humidity output scale. The digital Relative Humidity sensor is protected by a stainless steel filter that is easily removed for cleaning. The NEMA rated polycarbonate enclosure and cable entry connection provides weathertight protection. Screws are provided for mounting via internal holes inside the enclosure. The terminal connection for the output signal is as shown in Figure 1-1 below.

![Transmitter Internal Diagram](image)

Figure 1-1. Transmitter Internal Diagram

Most of the models come with a replaceable sensor probe; the process of replacing the sensor probe is very simple. See the “Maintenance” section for details.

**The models with a replaceable sensor probe are:**
HX92BC, HX92BV0, HX92BV1, HX92BV2, HX92BC-RP1, HX92BV0-RP1, HX92BV1-RP1, HX92BV2-RP1.

**The models without a replaceable sensor probe are:**
HX92BC-D, HX92BV0-D, HX92BV1-D, HX92BV2-D.
Section - 2 Unpacking

Remove the packing list and verify that you have received all your equipment. If you have any questions about the shipment, please call our Customer Service Department at 1-800-622-2378 or 203-359-1660. On the web you can find us at: www.omega.com e-mail: cservice@omega.com

When you receive the shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE:

The carrier will not honor any damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

The following items are supplied in the box with your HX92B Series transmitter.

- HX92B Series Quick start Manual, MQS-5339 (1 ea.)
- #6 Wall Anchor and #6 Mounting Screw (2 ea.)
2.1 HX92B available models and functional description

<table>
<thead>
<tr>
<th>Model number</th>
<th>Description</th>
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<tbody>
<tr>
<td>HX92BC</td>
<td>Wall Mount Relative Humidity Transmitter, 4 to 20mA.</td>
</tr>
<tr>
<td>HX92BV0</td>
<td>Wall Mount Relative Humidity Transmitter, 0 to 1 volt.</td>
</tr>
<tr>
<td>HX92BV1</td>
<td>Wall Mount Relative Humidity Transmitter, 0 to 5 volt.</td>
</tr>
<tr>
<td>HX92BV2</td>
<td>Wall Mount Relative Humidity Transmitter, 0 to 10 volt.</td>
</tr>
<tr>
<td>HX92BC-D</td>
<td>Duct Mount Relative Humidity Transmitter, 4 to 20mA.</td>
</tr>
<tr>
<td>HX92BV0-D</td>
<td>Duct Mount Relative Humidity Transmitter, 0 to 1 volt.</td>
</tr>
<tr>
<td>HX92BV1-D</td>
<td>Duct Mount Relative Humidity Transmitter, 0 to 5 volt.</td>
</tr>
<tr>
<td>HX92BV2-D</td>
<td>Duct Mount Relative Humidity Transmitter, 0 to 10 volt.</td>
</tr>
<tr>
<td>HX92BC-RP1</td>
<td>Remote Probe Relative Humidity Transmitter, 4 to 20mA Output with 3 m (10') cable.</td>
</tr>
<tr>
<td>HX92BV0-RP1</td>
<td>Remote Probe Relative Humidity Transmitter, 0 to 1 volt output with 3 m (10') cable.</td>
</tr>
<tr>
<td>HX92BV1-RP1</td>
<td>Remote Probe Relative Humidity Transmitter, 0 to 5 volt output with 3 m (10') cable.</td>
</tr>
<tr>
<td>HX92BV2-RP1</td>
<td>Remote Probe Relative Humidity Transmitter, 0 to 10 volt output with 3 m (10') cable.</td>
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Accessories

<table>
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<tr>
<th>Model number</th>
<th>Description</th>
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<tbody>
<tr>
<td>TH-RP</td>
<td>Field replaceable remote probe with 3 m (10') cable and M12 connector.</td>
</tr>
<tr>
<td>TH-SP</td>
<td>Field replaceable 71.88 L mm (2.83&quot;) short probe with M12 connector.</td>
</tr>
<tr>
<td>HX92-CAL</td>
<td>Calibration Kit and 75% relative humidity standards.</td>
</tr>
<tr>
<td>IND-KIT</td>
<td>Spare duct mount kit for HX92(<em>), HX92B(</em>)-D or HX92B(*)-RP1</td>
</tr>
</tbody>
</table>

*For 4 to 20 mA output specify "C", for 0 to 1 Vdc output specify "V0", for 0 to 5 Vdc output specify "V1", and for 0 to 10 Vdc output specify "V2".
3.1.1 Theory of Operation

A 4 to 20 mA loop is a series loop in which a transmitter will vary the current flow depending on the input to the transmitter. In the HX92B the amount of the current allowed to flow in the loop will vary depending on the relative humidity being measured by the sensor. Some advantages of a current output over a voltage output is that the signal measured is less susceptible to electrical noise interference, and the loop can support more than one measuring instrument as long as the maximum loop resistance is not exceeded.

A typical application utilizing a current loop will normally consist of a power supply, the transmitter and a meter, recorder or controller to measure the current flow. The maximum allowable loop resistance for the HX92B to function properly is found by using the following formula:

$$R_{max} = (\frac{(\text{power supply voltage} - 4)}{.02})$$

EXAMPLE: (When using a 30 Vdc power supply).

$$R_{max} = (\frac{(30 - 4)}{.02}) = 1,300 \text{ ohms max loop resistance}$$

**CAUTION:**

All electrical connections and wiring should be performed by a suitably trained professional only.

Follow the electrical connection diagram shown in figure 3-1 and 3-2 below to set up your Relative Humidity Transmitter.

![Figure 3-1. Voltage Output Connection Diagram](image-url)
Figure 3-2. Current Output Connection Diagram
Section 4 - Mounting

The HX92B transmitters are designed for wall, duct or remote probe mounting depending upon the model. Plastic wall anchors and mounting screws are included with Wall Mount and Remote Probe models. A duct mounting kit is included with Duct Mount models.

See Figure 4-1, Figure 4-2 and Figure 4-3 for the Wall Mount, Duct Mount and Remote Probe model dimensions for your mounting reference.
Figure 4-2. Duct Mount Model Dimensions

Figure 4-3 Remote Probe Model Dimensions
Section 5 - Relative Humidity Output Calculations

To calculate % relative humidity by measuring the current or voltage output, use the following formulas:

**For current output:**

\[\text{%RH} = \left(\text{Current measured in milliamps} - 4\right) \div 0.16\]

Where:

- \(4\) = offset current in mA.
- \(0.16\) = full scale current limit in percent (%).

**For voltage output**

a. 1 volt output:

\[\text{%RH} = \left(\text{voltage measured in volts} \times 100\right)\]

b. 5 volt output:

\[\text{%RH} = \left(\text{voltage measured in volts}/5\right) \times 100\]

c. 10 volt output:

\[\text{%RH} = \left(\text{voltage measured in volts}/10\right) \times 100\]
<table>
<thead>
<tr>
<th>% Relative Humidity</th>
<th>Output</th>
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Section 6 - Calibration

Your transmitter has been digitally calibrated and tested to meet or exceed the specifications outlined in this manual in our factory. The transmitter must be sent back to the factory for any re-calibration request.
Section 7 - Maintenance

The sensor probe can be replaced quickly for Wall Mount and Remote Probe models.

Procedure to replace the sensor probe:

a. Loosen the securing nut, and pull the sensor probe out.

b. Insert the new sensor probe to the M12 connector, and tighten the securing nut to secure the connection.

If your HX92B will be used in a dusty environment, the protective sensor filter (if clogged) may be removed for cleaning.

Unscrew the protective cover and gently blow compressed air through the filter screen. A soft brush may also be used to remove dirt particles from the screen.

If the sensor is subjected to 100% condensation, it must be dried to obtain correct readings. There will be no permanent damage or calibration shift to the unit.

Units should not be exposed to high concentrations of ammonia or alcohol vapors.

The Duct Mount model transmitter must be sent back to the factory if sensor replacement or recalibration is needed.
Specifications

Section 8 - Specifications

Measuring Range: 0 to 100%
Accuracy Range: ±2.5% from 20 to 80% RH, ±3.5% from 5 to 20% and 80 to 95% RH; ±4% from 0 to 5% and 95 to 100% RH
Hysteresis: ±1%
Repeatability: ±0.1%
Resolution: 0.1%
Response Time: 8 Seconds typical
Sample Rate: 1 sample every 4 seconds.
Operating Temperature: -30 to 75°C

Input Power
4-20mA: 9 to 30 Vdc @ 50mV
0-1V: 9 to 30 Vdc @ 50mA
0-5V: 9 to 30 Vdc @ 50mA
0-10V: 12 to 30 Vdc @ 50mA

Max Loop Resistance: 200 Ohms @ 9 Vdc supply voltage
(4 to 20mA) 1,300 Ohms @ 30 Vdc supply voltage
Ohms = ((V supply – 4 V) / .02 A)
Max. Load (min. resistance)

Resistance: 1.25K for outputs: 0 – 1 Vdc, 0 – 5 Vdc
2.40K for 0 – 10 Vdc output

Sensor Type: Digital Sensor
Enclosure Housing: Gray Polycarbonate, NEMA 13 (IP 54).
Connections: Nylon, Liquid-tight with neoprene gland for 2.29 to 6.73 m (0.09 to 0.265”) diameter cable, internal 5 position terminal block accepts wire size from 14 to 22 gauge wire.

Dimensions: See “Mounting” Section

Weight:
HX92B (*): 124 g (4.4 oz)
HX92B (*)-D: 132 g (4.7 oz)
HX92B (*)-RP1: 230 g (8.1 oz)

* 4 to 20 mA, 0 to 1 volt, 0 to 5 volts or 0 to 10 volts output. See page 2.2 for model numbers.
OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. OMEGA’s WARRANTY adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that OMEGA’s customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA’s Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA’s WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA’s control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA’S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:
1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA’s policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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