

WARRANTY/DISCLAIMER

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.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

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.

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 or calibration,
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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Replace Sensor Probe

The Sensor probe can be replaced quickly for the wall mount and remote models.

Models with a replaceable Sensor Probe:

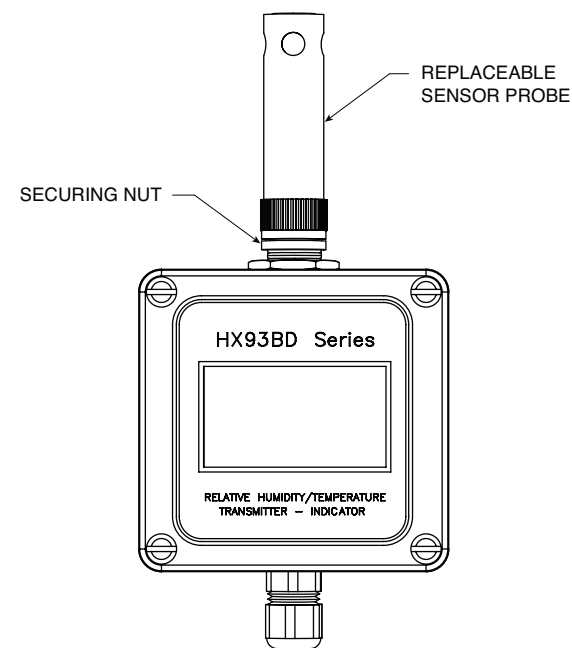
HX93BDC, HX93BDV0, HX93BDV1, HX93BDV2, HX93BDC-PR1, HX93BDV0-PR1, HX93BDV1-PR1, HX93BDV2-PR1, HX93BC, HX93BV0, HX93BV1, HX93BV2, HX93BC-RP1, HX93BV0-RP1, HX93BV1-RP1, HX93BV2-RP1.

Models without a replaceable Sensor Probe:

HX93BDC-D, HX93BDV0-D, HX93BDV1-D, HX93BDV2-D, HX93BC-D, HX93BV0-D, HX93BV1-D, HX93BV2-D.

Procedure to replace the Sensor:

1. Loosen up the Sensor Probe nut and pull out the sensor probe.
2. Insert the new sensor probe into the M12 connector then tighten the secure nut to secure the connection.



Sensor Probe Replacement

Calibration

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

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Specifications

Temperature

Measuring Range

Standard:

-30 to 75°C (-22°F to 167°F)
(Without jumper on connection J4)

Special:

-20 to 75°C (-4° to 167°F)
(With jumper on connector J4 pin 1 to pin 2)

Accuracy:

±0.6 °C (1 °F), from 0 to 50°C (32 to 122°F); ±1.25°C from -30 to 0°C (-22 to 32°F) and 50 to 75°C (122 to 167°F)

Repeatability:

±0.1% RH; ± 0.2 °C (0.4 °F)

Resolution:

0.1°C

Response Time:

5 Seconds min., 30 second max.

Sample Rate:

1 Sample every 4 seconds

Input Voltage Range:

9 to 30 Vdc @20mA: 4 to 20 mA
0 -1 volt; 0 - 5 volts output.
12 to 30 Vdc @ 20 mA: 0 to 10 volts output volts

Max Loop Resistance:

200 Ohm @ 9 Vdc supply voltage
(4 to 20 mA)
1,250 Ohm @ 30 Vdc supply voltage
Ohm = [(V supply - 4 V) ÷ 0.02A] - 50

Max Load Resistance: (Min. Resistance)

1.250 K (For all outputs: 0-1 Vdc; 0-5 Vdc; 0-10 Vdc)

Sensor Type:

Digital Sensor

Relative Humidity

Measuring Range:

0 to 100% RH

Accuracy:

±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% RH

Repeatability:

±0.1%

Resolution:

0.1%

Response Time:

8 seconds typical

Sample Rate:

1 Sample every 4 seconds

Input Voltage Range:

See above "Temperature" section

Max Loop Resistance: (4 to 20 mA)

See above "Temperature" section

Max Load Resistance: (Min. Resistance)

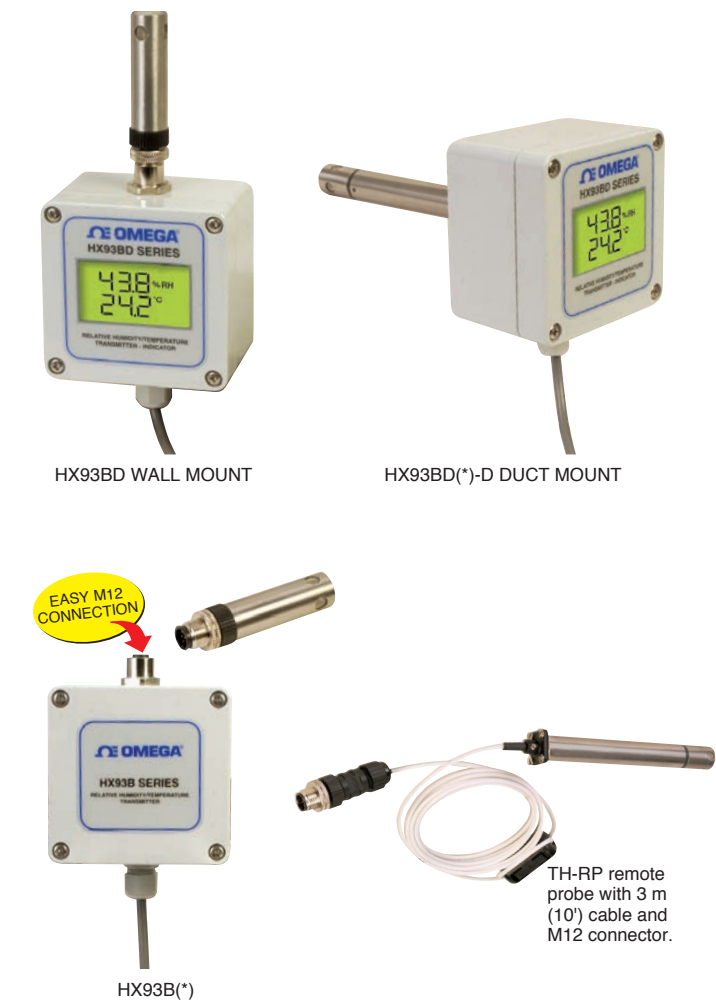
See above "Temperature" section

Sensor Type:

Digital Sensor

QUICK START

For complete product manual:
www.omega.com/manuals/manualpdf/M5340.pdf



HX93B(*)

HX93BD(*)-D DUCT MOUNT

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

HX93B SERIES Temperature/Relative Humidity Transmitters



OMEGA

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Servicing North America:

U.S.A.: OMEGA Engineering, Inc., One Omega Dr.
P.O. Box 4047, Stamford, CT 06907-0047 USA
Toll-Free: 1-800-826-6342 (USA & Canada Only)
Customer Service: 1-800-622-2378 (USA & Canada Only)
Engineering Service: 1-800-872-9436 (USA & Canada Only)
Tel: (203) 359-1660 Fax: (203) 359-7700
e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide

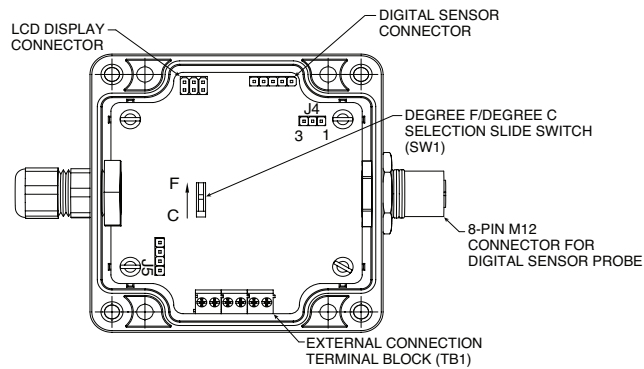
The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

Using This Quick Start Manual

Use this Quick Start Manual with your HX93B Series Temperature/Relative Humidity Transmitter for quick installation and basic operation. For detailed information refer to the User's Guide (Manual M5340).

General Information

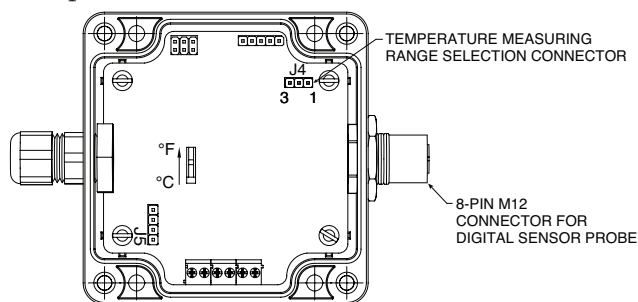
The OMEGA® HX93B and HX93BD Series Temperature/Relative Humidity Transmitters provide a linearized and temperature compensated output signal of 4 to 20mA, 0 to 1 VDC, 0 to 5 VDC, or 0 to 10 VDC depending upon the model selected for both temperature and relative humidity measurement. The output signals have been calibrated and scaled from -30°C to 75°C for temperature and 0 to 100% for relative humidity. The digital temperature and 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 watertight protection. Screws are provided for mounting via internal holes inside the enclosure.



Transmitter Internal Diagram

Temperature Measuring Range Selection

The temperature measuring range of the HX93B can be modified by making a minor change to a connector J4. The standard temperature measuring range is -30 to 75°C (-22 to 167°F). If you would like to change the range to -20 to 75°C (-4 to 167°F), add a jumper on connector J4 pin 1 to pin 2. See the diagram below for the location of the connector and its pins.



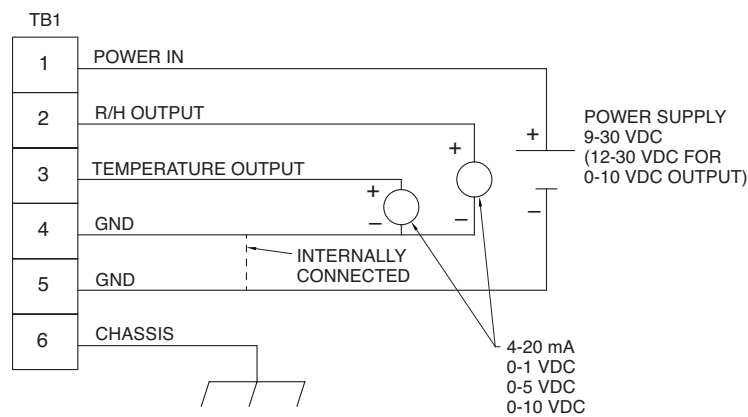
Temperature Measuring Range Selection Diagram

Electrical Connection (Wiring)

CAUTION:

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

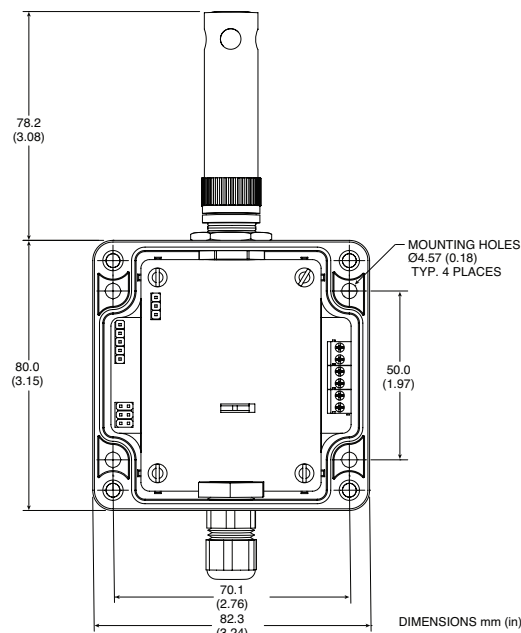
Follow the electrical connection diagram shown below to set up your Temperature/Relative Humidity Transmitter.



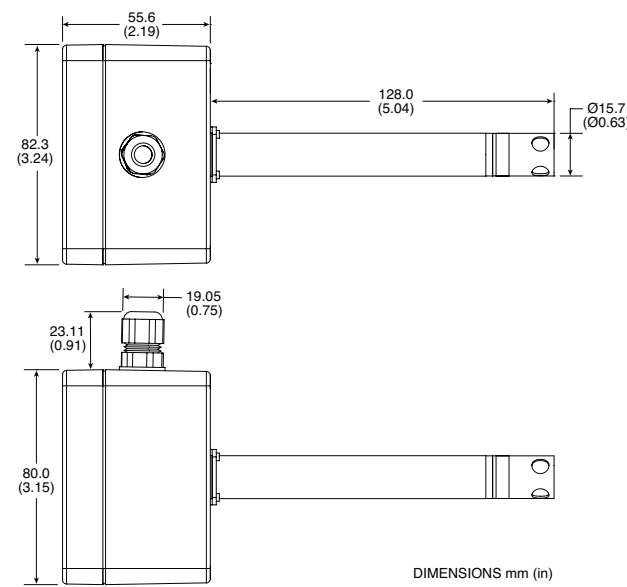
Electrical Connection Diagram

Mounting

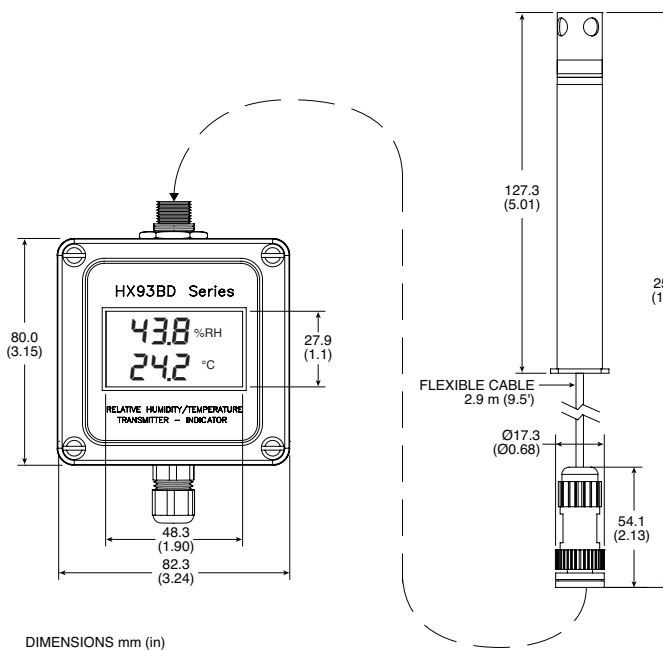
The HX93B and HX93BD transmitters are designed for wall, duct or remote probe mounting depending upon the model. Plastic wall anchors and mounting screws are included for wall mounting and remote probe models. A duct mounting kit is included with duct mount models.



Wall Mount Model Dimensions



Duct Mount Model Dimensions



Remote Probe Model Dimensions

Temperature Output Calculations

To calculate Temperature by measuring the current or voltage output, use the following formulas.

a) To calculate temperature from 4 to 20 mA current output:

$$\text{Temperature in } ^\circ\text{C} = [(\text{Output current in milliamps} - 4) / 0.1524] - 30 \quad (-30 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [(\text{Output current in milliamps} - 4) / 0.0847] - 22 \quad (-22 \text{ to } 167^\circ\text{F Range})$$

$$\text{Temperature in } ^\circ\text{C} = [(\text{Output current in milliamps} - 4) / 0.1684] - 20 \quad (-20 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [(\text{Output current in milliamps} - 4) / 0.0935] - 4 \quad (-4 \text{ to } 167^\circ\text{F Range})$$

b) To calculate temperature from 0 to 1 volt output:

$$\text{Temperature in } ^\circ\text{C} = [\text{Output voltage in volts} / 0.00952] - 30 \quad (-30 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [\text{Output voltage in volts} / 0.00529] - 22 \quad (-22 \text{ to } 167^\circ\text{F Range})$$

$$\text{Temperature in } ^\circ\text{C} = [\text{Output voltage in volts} / 0.01052] - 20 \quad (-20 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [\text{Output voltage in volts} / 0.00584] - 4 \quad (-4 \text{ to } 167^\circ\text{F Range})$$

c) To calculate temperature from 0 to 5 volts output:

$$\text{Temperature in } ^\circ\text{C} = [\text{Output voltage in volts} / 0.0476] - 30 \quad (-30 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [\text{Output voltage in volts} / 0.0265] - 22 \quad (-22 \text{ to } 167^\circ\text{F Range})$$

$$\text{Temperature in } ^\circ\text{C} = [\text{Output voltage in volts} / 0.0526] - 20 \quad (-20 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [\text{Output voltage in volts} / 0.0292] - 4 \quad (-4 \text{ to } 167^\circ\text{F Range})$$

d) To calculate temperature from 0 to 10 volts output:

$$\text{Temperature in } ^\circ\text{C} = [\text{Output voltage in volts} / 0.0952] - 30 \quad (-30 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [\text{Output voltage in volts} / 0.0529] - 22 \quad (-22 \text{ to } 167^\circ\text{F Range})$$

$$\text{Temperature in } ^\circ\text{C} = [\text{Output voltage in volts} / 0.1052] - 20 \quad (-20 \text{ to } 75^\circ\text{C Range})$$

$$\text{Temperature in } ^\circ\text{F} = [\text{Output voltage in volts} / 0.0584] - 4 \quad (-4 \text{ to } 167^\circ\text{F Range})$$

Relative Humidity Output Calculations

To calculate % Relative Humidity by measuring the current or voltage output, use the following formulas.

For current output:

$$\%RH = (\text{Current measured in milliamps} - 4) \div 0.16$$

For voltage output:

a) 1 volts output:

$$\%RH = (\text{voltage measured in volt} \times 100)$$

b) 5 volts output:

$$\%RH = (\text{voltage measured in volt} / 5 \times 100)$$

c) 10 volts output:

$$\%RH = (\text{voltage measured in volt} / 10) \times 100$$