

1 YEAR
WARRANTY



Ω OMEGA® **User's Guide**



Shop online at
omega.comSM

e-mail: info@omega.com
For latest product manuals:
www.omegamanual.info

HX94B SERIES **Temperature/Relative Humidity** **Transmitter**



omega.com info@omega.com

Servicing North America:

U.S.A.:

Omega Engineering, Inc., One Omega Drive, 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



Table of Contents

Section	Page
Section 1 - Introduction	1-1
Section 2 - Unpacking	2-1
Section 3 - Operation	3-1
Section 4 - Mounting	4-1
Section 5 - Analog Output Calculations	5-1
Section 6 - Calibration	6-1
Section 7 - Maintenance	7-1
Section 8 - Specifications	8-1



HH94B SERIES Temperature/Relative Humidity Transmitter

List of Figures

Figure	Description	Page
3-1	Electrical Connection With Stripped Leads Termination	3-1
3-2	Electrical Connection With 4-Pin Connector Termination	3-1
4-1	General Dimensions	4-1
4-2	HX94B Mounting Hardware	4-1

Section 1 - Introduction

The OMEGA® HX94B Series Temperature/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 for both temperature/relative humidity measurement, depending upon the model selected. The output signals have been calibrated and scaled to 0°C to 100°C for temperature and 0 to 100% for relative humidity. The digital temperature and relative humidity sensor is protected by a stainless steel cap that is easily removed for cleaning. The NEMA-4 stainless steel enclosure and IP68-rated cable gland (non-NPT versions only) provide weather tight protection. All units include a 6-foot shielded cable. The cable end terminates in either stripped leads or a 4-pin connector.

Section 2 - Unpacking

Remove the packing list and verify that you have received all of the intended 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:

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.

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 HX94B transmitter.

- Quick Start Manual, # MQS5495 (1 ea.)
- Wall/Duct Mounting Kit (1 ea.)
- 4-Pin Mating Connector; with connector models only (1 ea.)
- Dewpoint Card (1 ea.)

The following table lists all the HX94B series models and descriptions:

Model No.	Description
HX94BC	RH/Temperature Transmitter (4 to 20 mA Output) with 1.8 m (6ft) lead wires through a liquid tight cable gland, terminated in a 4 Pin Connector.
HX94BV0	RH/Temperature Transmitter (0 - 1 Vdc Output) with 1.8 m (6ft) lead wires through a liquid tight cable gland, terminated in a 4 Pin Connector.
HX94BV1	RH/Temperature Transmitter (0 - 5 Vdc Output) with 1.8 m (6ft) lead wires through a liquid tight cable gland, terminated in a 4 Pin Connector.
HX94BV2	RH/Temperature Transmitter (0 - 10 Vdc Output) with 4 Pin Connector.
HX94BCW	RH/Temperature Transmitter (4 to 20 mA Output) with 1.8 m (6ft) lead wires through a liquid tight cable gland.
HX94BV0W	RH/Temperature Transmitter (0 - 1 Vdc Output) with 1.8 m (6ft) lead wires through a liquid tight cable gland.
HX94BV1W	RH/Temperature Transmitter (0 - 5 Vdc Output) with 1.8 m (6ft) lead wires through a liquid tight cable gland.
HX94BV2W	RH/Temperature Transmitter (0 - 10 Vdc Output) with 1.8 m (6ft) lead wires through a liquid tight cable gland.
HX94BCNPT	RH/Temperature Transmitter (4 to 20 mA Output) with 1/2in male NPT fitting and 1.8 m (6ft) lead wires.
HX94BV0NPT	RH/Temperature Transmitter (0 - 1 Vdc Output) with 1/2in male NPT fitting and 1.8 m (6ft) lead wires.
HX94BV1NPT	RH/Temperature Transmitter (0 - 5 Vdc Output) with 1/2in male NPT fitting and 1.8 m (6ft) lead wires.
HX94BV2NPT	RH/Temperature Transmitter (0 - 10 Vdc Output) with 1/2in male NPT fitting and 1.8 m (6ft) lead wires.

Section 3 - Operation

The HX94B series terminates to a 6-foot shielded cable. The cable end is either stripped leads or terminates to a 4-pin connector. Figures 3-1 and 3-2 illustrate these termination options and how they are to be connected.

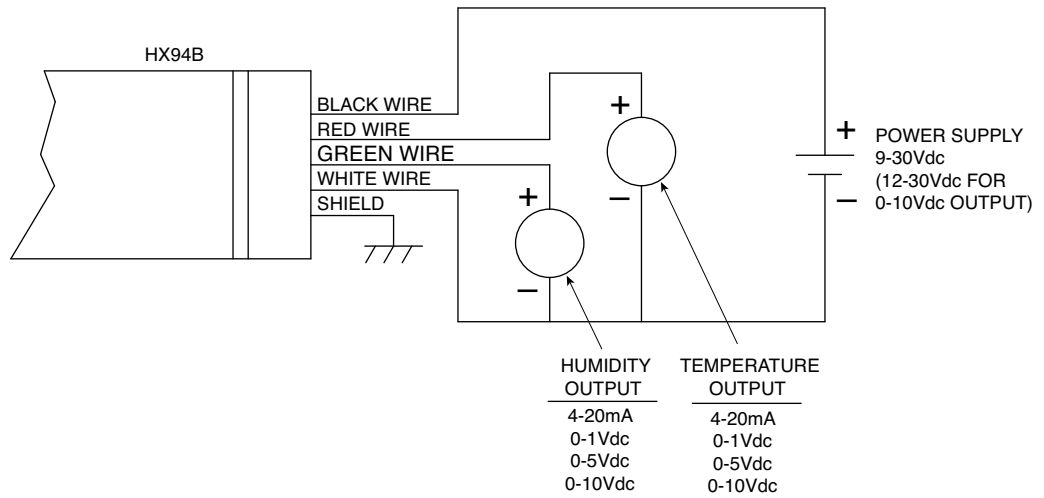


Figure 3-1. Electrical Connection With Stripped Leads Termination

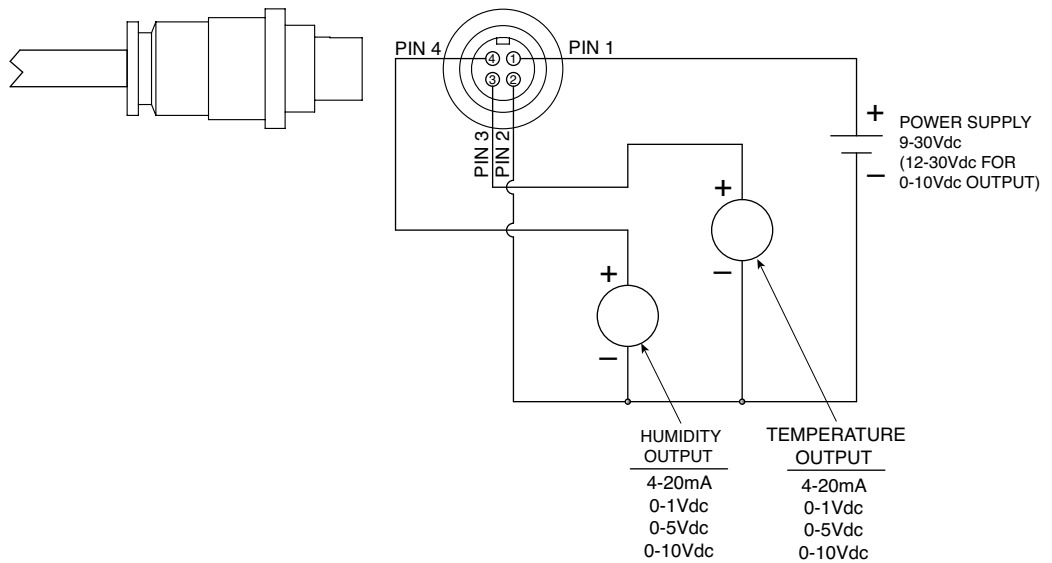


Figure 3-2. Electrical Connection With 4-Pin Connector Termination

Section 4 - Mounting

OMEGA's HX94B transmitters are designed for either wall or duct mounting. A wall/duct mounting kit is included with each unit.

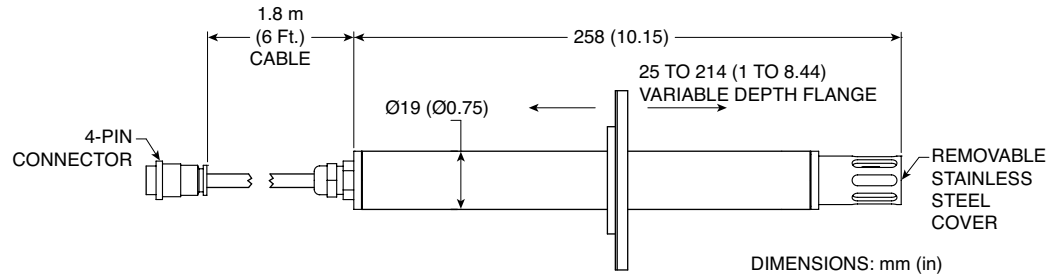


Figure 4-1. General Dimensions

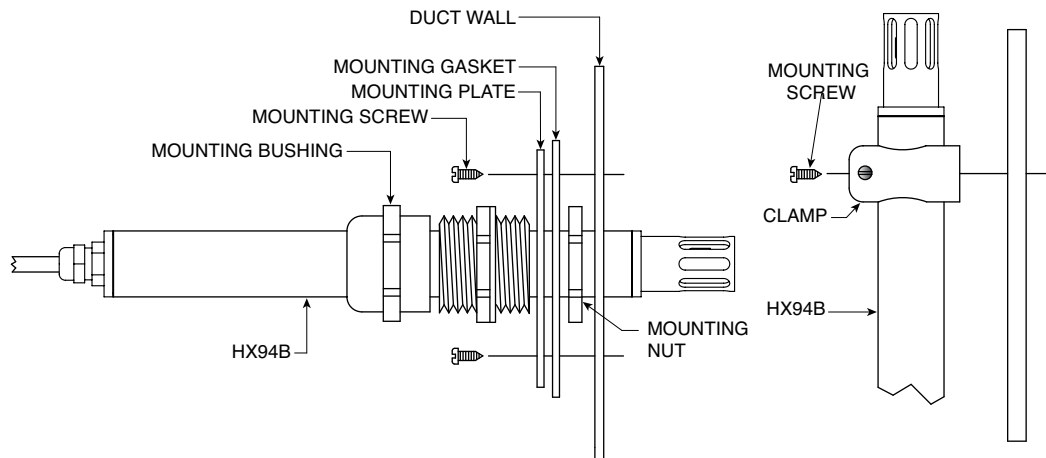


Figure 4-2. HX94B Mounting Hardware

Section 5 - Analog Output Calculations

To calculate the temperature by measuring the current or voltage output, use the following formulas:

- a) To calculate temperature from 4 to 20 mA current output:
Temperature in °C = (Output current in milliamps - 4) / 0.16
(0 to 100 °C Range)
Temperature in °F = [(Output current in milliamps - 4) / 0.0888] + 32
(32 to 212 °F Range)
- b) To calculate temperature from 0 to 1 volt output:
Temperature in °C = Output voltage in volts / 0.01
(0 to 100 °C Range)
Temperature in °F = [Output voltage in volts / 0.00555] + 32
(32 to 212 °F Range)
- c) To calculate temperature from 0 to 5 volts output:
Temperature in °C = Output voltage in volts / 0.05
(0 to 100 °C Range)
Temperature in °F = [Output voltage in volts / 0.02775] + 32
(32 to 212 °F Range)
- d) To calculate temperature from 0 to 10 volts output:
Temperature in °C = Output voltage in volts / 0.1
(0 to 100 °C Range)
Temperature in °F = [Output voltage in volts / 0.0555] + 32
(32 to 212 °F Range)

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

- a) To calculate humidity from 4 to 20 mA current output:
Humidity in %RH = (Output current in milliamps - 4) / 0.16
- b) To calculate humidity from 0 to 1 volt output:
Humidity in %RH = Output voltage in volts / 0.01
- c) To calculate humidity from 0 to 5 volts output:
Humidity in %RH = Output voltage in volts / 0.05
- d) To calculate humidity from 0 to 10 volts output:
Humidity in %RH = Output voltage in volts / 0.1

Section 6 - Calibration

While at our factory, your transmitter has been digitally calibrated and tested to meet or exceed the specifications outlined in this manual. The transmitter must be sent back to Omega Engineering, Inc. for any re-calibration request.

Section 7 - Maintenance

If your Humidity transmitter will be used in a dusty environment, the protective cap, if clogged, may be removed for cleaning. Unscrew the protective cover and gently blow compressed air into the cap and around the sensor area.

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.

Section 8 - Specifications

TEMPERATURE	
Measuring Range:	0 to 100°C (32 °F to 212°F)
Accuracy:	±0.6°C from 0 to 50°C (32 to 122°F) ±1.25°C from 50 to 100°C (122 to 212°F)
Repeatability:	±0.2°C (0.4°F)
Response Time:	5 Seconds min., 30 seconds max.
Sample Rate:	1 Sample every 4 seconds
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%RH
Response Time:	8 Seconds typical
Sample Rate:	1 Sample every 4 seconds
Operating Temperature Range:	0 to 100°C
Analog Outputs	
Temperature:	4-20mA, 0-1V, 0-5V, 0-10V
Humidity:	4-20mA, 0-1V, 0-5V, 0-10V
Input Power Supply:	9 to 30 Vdc @ 100mA: 4 to 20mA, 0-1V, 0-5V output 12 to 30 Vdc @ 100mA: 0 to 10V output
Max Current Loop Resistance:	Ohms = [(V supply - 4V) / 0.02A] - 50 200 Ohms @ 9V supply or 1250 Ohms @ 30V supply
Max Load Resistance:	1.25 K (For all voltage outputs)
Sensor Type:	Digital Sensor
Enclosure Housing:	316 Stainless Steel, NEMA 4; non-NPT version includes IP68-rated cable gland
Electrical Connections	
HX94B**W, HX94B**NPT:	1.8m (6ft) 4 conductor Teflon shielded cable with stripped leads termination
HX94B**:	1.8m (6ft) 4 conductor Teflon shielded cable with a 4-pin connector termination. A 4-pin mating connector is included that accepts 18 to 26 AWG wire
Dimensions:	258mm L x ø19mm OD (10.15in L x ø0.75in OD)
Weight:	200g (7 oz) with mounting kit

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.

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.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 2015 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!** *Shop online at omega.comSM*

TEMPERATURE

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- ☑ Transducers & Strain Gages
- ☑ Load Cells & Pressure Gages
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

FLOW/LEVEL

- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

pH/CONDUCTIVITY

- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

DATA ACQUISITION

- ☑ Data Acquisition & Engineering Software
- ☑ Communications-Based Acquisition Systems
- ☑ Plug-in Cards for Apple, IBM & Compatibles
- ☑ Data Logging Systems
- ☑ Recorders, Printers & Plotters

HEATERS

- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- ☑ Metering & Control Instrumentation
- ☑ Refractometers
- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
- ☑ pH, Conductivity & Dissolved Oxygen Instruments