

Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!



User's Guide

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 Gauges
- Load Cells & Pressure Gauges
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine / Paddlesheel 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
- Datalogging 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



<http://www.omega.com>
e-mail: info@omega.com

HX801 & HX802 SERIES HUMIDITY & TEMPERATURE TRANSMITTER

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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.
 WARNING: These products are not designed for use in, and should not be used for, patient connected applications.

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 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 should malfunction, 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 being 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 which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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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, 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. P.O. 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. P.O. number to cover the COST of the repair,
2. Model and serial number of 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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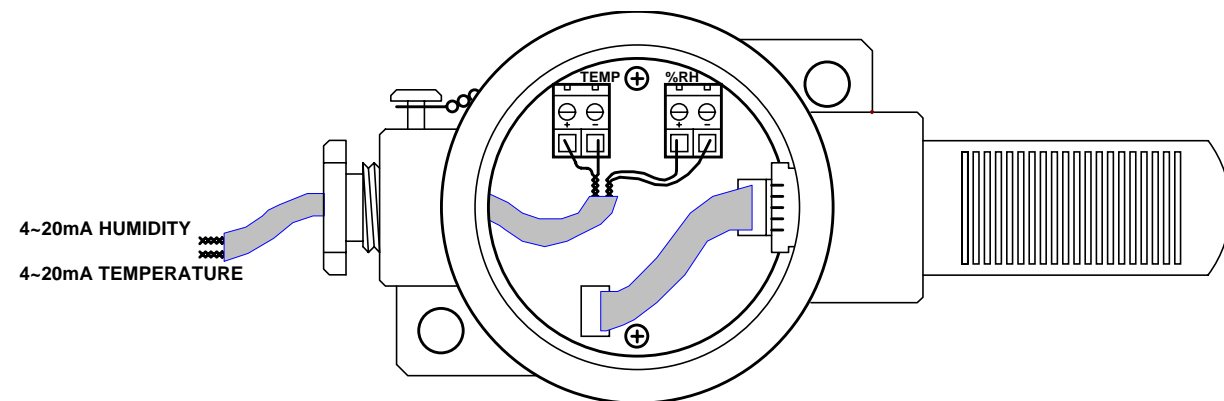
The Proper Installation & Maintenance .

MOUNTING.

- (1) Mount in a clean environment.
- (2) Do not subject to vibration.
- (3) Avoid mounting near power control equipment.
- (4) Mount the HX802 on a solid wall or panel, where air will flow freely around it.
- (5) Mount the HX801 through a HX801-FLG 100mm flange, into the duct.
- (6) Always mount the transmitter so that the protective cap is either horizontal or sloping downwards. This helps prevent condensate build up in high humidity situations.
- (7) Avoid mounting where the protective cap will get wet as this may cause false readings.
- (8) Again ensure there is adequate air flow over the sensor.
- (9) To maintain compliance with the EMC Directives, the metal enclosure must be properly earthed, with appropriate input / output entry points, cabling and filtering.

WIRING.

- (1) All cables should be good quality overall screened INSTRUMENTATION CABLE with the screen earthed at one end only.
- (2) Signal cables should be laid a minimum distance of 300mm from any power cables.
- (3) For the two, 2 wire current loops Austral Standard Cables B5002CS is recommended.
- (4) It is recommended that you do not ground current loops and use power supplies with ungrounded outputs.
- (5) Lightning arrestors should be used when there is a danger from this source.
- (6) Refer to diagrams for connection information.



COMMISSIONING.

- (1) Once all the above conditions have been carried out and the wiring checked apply power to the loops and allow five minutes for them to stabilize.
- (2) To check humidity accuracy use a calibration standard %RH device in the same location. Check that the readings agree within 2% + % error of the calibration device. Alternatively expose the transmitter to a known %RH atmosphere, and check the readings agree within 2% + % error of atmosphere. All readings should be referenced against the ASTM Relative Humidity tables, and allowances made for pressure effects if necessary. Any differences can be corrected using the Humidity Zero and Span trim pots. (Clockwise to increase the output reading, and anticlockwise to decrease the output readings.)
- (3) To check temperature accuracy use a calibration standard RTD in the same location. Check that the readings agree within 0.1% of the calibration device. Any differences can be corrected using the Temperature Zero and Span trim pots. (Clockwise to increase the output reading, and anticlockwise to decrease the output readings.)

MAINTENANCE.

- (1) Repeat 2 and 3 of Commissioning - breathing on the protective cap will cause the %RH and Temperature readings to alter.
- (2) Do it regularly - at least once every 6 months.
- (3) Check cables entering the head.

CLEANING OR REPLACING THE PROTECTIVE CAP.

If the protective cap becomes dirty it can easily be removed for cleaning, or replaced, as follows:

- (1) Disconnect power.
- (2) Carefully unscrew the cap by hand. No tools to be used - they may damage the protective cap.
- (3) The cap may now be cleaned or replaced.
- (4) Ensure the cap is thoroughly dry before replacing.
- (5) Carefully screw the cap back on by hand, and reapply the power.

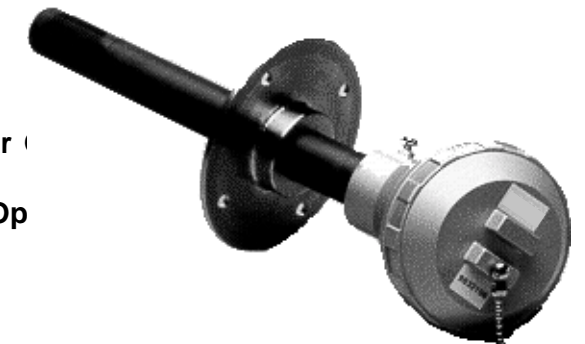
NOTE: Do not be operated without the protective cap, as the humidity sensor reading is affected by light.

HX801 & HX802 Humidity and Temperature Transmitters



Features.

- Dual 4~20mA Outputs.
- Monolithic IC Humidity Sensor.
- %RH Temperature Compensated Linear
- Pt100 RTD Sensor.
- Temperature Output 0~100C. (0~200F Op
- Temperature Output Linearised.
- Very Compact Design.
- High Accuracy.
- Low Cost.
- Easy to Install.
- Reverse Polarity Protection.
- Internally Accessible Span & Zero Adjustments.
- Wide Power Supply Range.



HX801



HX802

Description.

The HX801 & HX802 is a complete relative humidity and temperature sensing module, with two independent loop powered 4~20mA output signals, representing 0~100%RH and 0~100C.

Two versions are available:

- (i) Wall mount.
- (ii) Duct mount.

Both version come complete in an industry standard aluminium connection head. The relative humidity sensor and temperature compensating sensor protrude from the head inside a protective cap. This cap allows air to circulate to the sensors.

Reliability.

The wide operating range of the humidity and temperature sensors offer long term reliability over a broad range of applications. The sensors resist contaminating vapours such as organic solvents, chlorine, and ammonia.

Quality Assurance Programme.

The modern technology and strict procedures of the ISO9001 Quality Assurance Programme applied during design, development, production and final inspection grant the long term reliability of the instrument.

RH Transmitter Specifications.

Accurate to		<±2% FSO Typical. 0~100%RH @ 25C Saturated Salt Calibration.
	Important:	For continuous measurements of ≥95%RH, refer to note 4 below.
Ambient Temperature Drift		<±0.05%/C FSO Typical.
Humidity Sensor	-Hysteresis	±0.8% of Span Typical.
	-Linearity	±0.5%RH Typical.
	-Repeatability	±0.5%RH Typical.
	-Long Term Drift	±1%RH Typical at 50%RH in 5 years.

Temperature Transmitter Specifications.

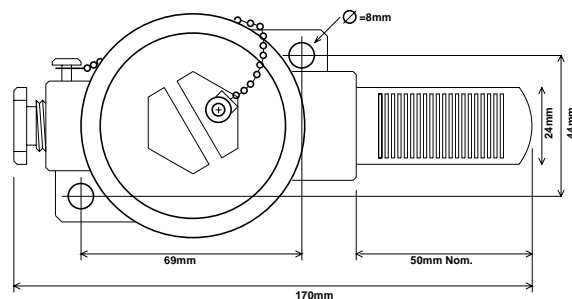
Accurate to		<±0.1% FSO Typical.
Linearity and Repeatability		<±0.1% FSO Typical.
Ambient Temperature Drift		<±0.02%/C FSO Typical.
RTD Sensor		Pt100 RTD, Class A Din 43760.
Sensor Current		0.5mA.

Common Specifications.

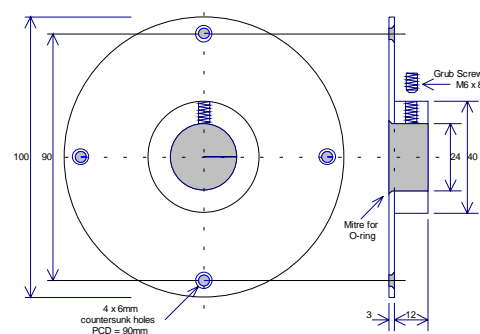
Output.		2 wire 4~20mA (Loop Powered).
Power Supply.		9~40Vdc.
Supply Voltage Sensitivity.		<±0.01%/V FSO.
Maximum Output Current.		Limited to <36mA.
Output Load Resistance.		750Ω @ 24Vdc. (50Ω/V Above 9Vdc).
R.F. Immunity.		<1% Effect FSO Typical.
Isolation Between %RH and Temperature		50Vac/dc Max.
Operating Temperature.	-at head ^{A)}	0~70C.
	-at sensor ^{B)}	-30~85C (LPN-H-D)
Storage Temperature.		-30~85C.
Operating Humidity.	-at head ^{A)}	90%RH Max. Non-condensing.
	-at sensor ^{B)}	0~100%RH. Refer note 4 below.

- Note: ^{A)} 'at head' refers to ratings for electronics housed in the connection head.
^{B)} 'at sensor' refers to ratings for electronics housed in the protective cap.
- Note 1. Good airflow and good air mixing must be maintained over the sensor to minimise local temperature fluctuations, and to ensure accurate measurements.
- Note 2. Specifications based on Standard Calibration Unit, unless otherwise specified.
- Note 3. Due to ongoing research and development designs, specifications, and documentation are subject to change without notification. No liability will be accepted for errors, omissions or amendments to this specification.
- Note 4. The RH sensors quickly recover from condensation or wetting with no shift in calibration. However, after 24 hours or longer exposures to either high >95%RH or continuous condensation, an upward shift of 2% to 3%RH may occur. This shift is repeatable and can be reversed by placing the sensor in a low 10%RH environment for a 10 hour period.
- CONDENSATION occurs whenever the surface temperature of the sensor's active area drops below the ambient dew point of the surrounding gas. Condensation forms on the sensor (or any surface) even if the surface temperature only momentarily drops below the ambient dew point. Small temperature fluctuations near the sensor can unknowingly cause condensation to form when operating at humidity levels above 95%.
- While quick to condense, water is slow to evaporate in high humidity conditions. (ie when the surface temperature of the sensor is only slightly above the ambient dew point.) Because of this, a sensor's recovery from either condensation or wetting is much longer than its normal time response. During recovery, the sensor outputs a constant 100%RH signal, regardless of the ambient RH.

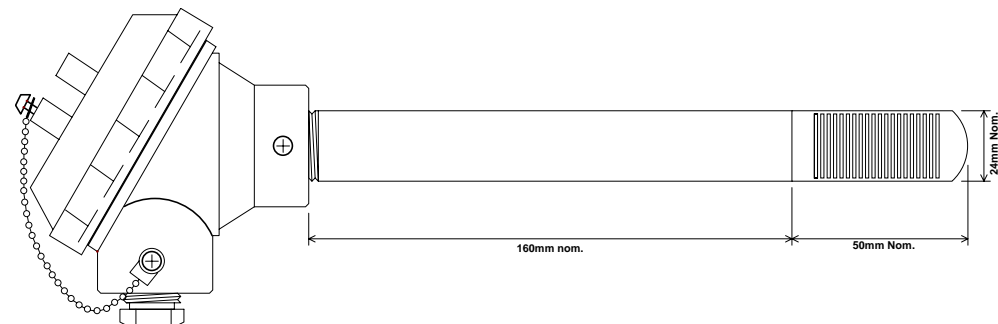
HX802 Dimensions.



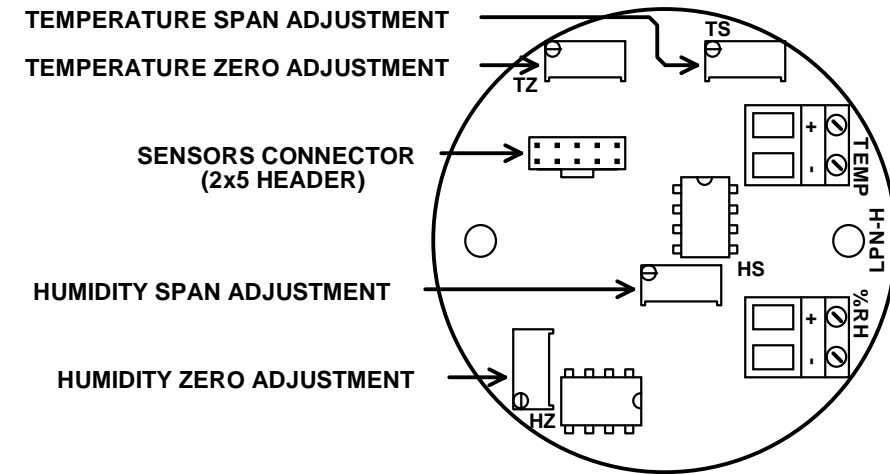
HX801-FLG Dimensions.



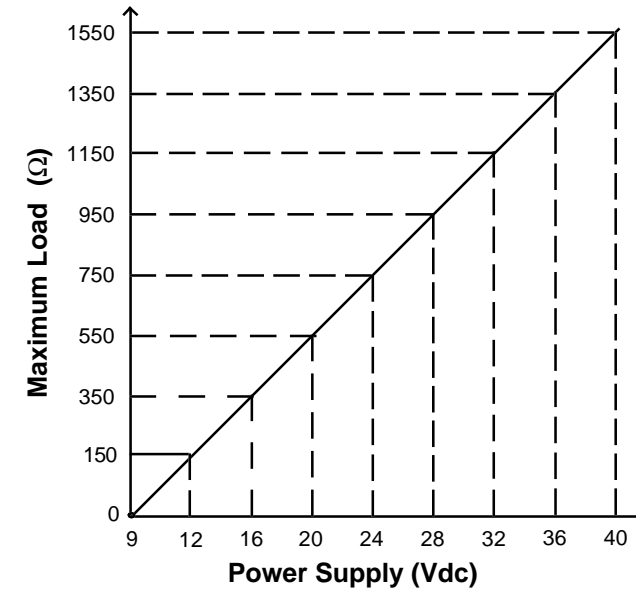
HX801 Dimensions.



Terminals and Layout.



Graph Of Maximum Load Versus Power Supply.



Connection Example.

