



# RH DUCT

## Relative Humidity, Duct, Nickel RTD



The ACI Relative Humidity with Nickel RTD Duct Series utilizes a thermoset polymer capacitive sensing element with a factory fitted hydrophobic filter to improve its moisture resistance. The sensing elements multilayer construction also provides excellent resistance in applications where dust, dirt, oils and common environmental chemicals are found. The RH duct sensors include on board DIP switches which allow the user to select the desired output signal and can be powered by AC or DC power sources. Each unit also contains 0%, 50%, and 100% test options to verify that the transmitter is both working and wired properly. Field calibration can be performed by using the increment and decrement calibration DIP switches without the need to replace the sensing element. These enhancements provide increased flexibility and outstanding long-term reliability without the need to replace the sensors in the field. Duct configurations feature a weatherproof Euro style enclosure with a gasketed cover and conformally coated circuit boards for increased moisture resistance in high humidity environments. The sensor is protected by a stainless-steel sintered filter. Three point NIST Calibration Certificates are available.

**Applications:** Humidification, Dehumidification, Supply / Discharge / Return Air, Economizers, Clean Rooms, Data Centers, Process Control, Schools, Hospitals, Office Buildings

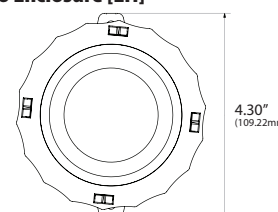
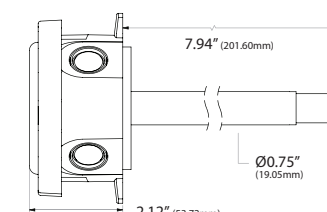
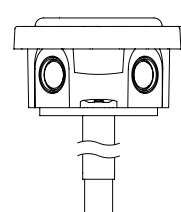
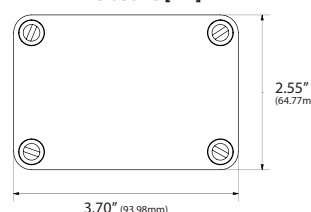
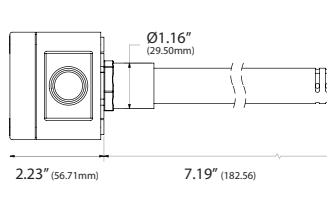
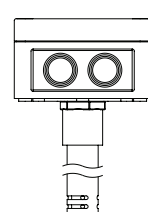
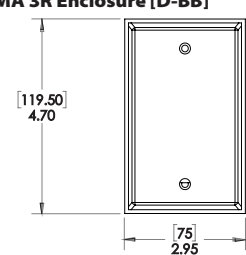
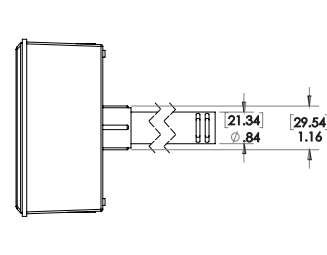
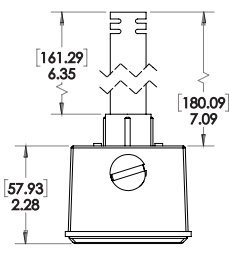
The ACI RH Nickel RTD Duct is covered by ACI's Five (5) Year Limited Warranty. The warranty can be found in the front of ACI's Sensors & Transmitters catalog, as well as on ACI's website, [workaci.com](http://workaci.com).

### PRODUCT SPECIFICATIONS

|  |   |
|--|---|
| <b>RH Supply Voltage (Reverse Polarity Protected):</b>                                 | <b>4-20 mA:</b> 250 Ohm Load: 15 - 40 VDC / 18 - 28 VAC   <b>500 Ohm Load:</b> 18 - 40 VDC / 18 - 28 VAC<br><b>0-5 VDC:</b> 12 - 40 VDC / 18 - 28 VAC   <b>0-10 VDC:</b> 18 - 40 VDC / 18 - 28 VAC  |
| <b>RH Supply Current (VA):</b>   | <b>Voltage Output:</b> 8 mA maximum (0.32 VA)   <b>Current Output:</b> 24 mA maximum (0.83 VA)  |
| <b>RH Output Load Resistance:</b>  | <b>4-20 mA:</b> 700 Ohms maximum   <b>0-5 VDC or 0-10 VDC:</b> 4K Ohms Minimum  |
| <b>RH Output Signal:</b>   | <b>2-wire:</b> 4 - 20 mA (Factory Default)   <b>3-wire:</b> 0-5 or 0-10 VDC and 4 - 20 mA (Field Selectable)  |
| <b>RH Accuracy @ 77°F (25°C):</b>  | +/- 1% over 20% RH Range between 20 to 90%   +/- 2%, or 3% from 10 to 95%   |
| <b>RH Measurement Range:</b>   | 0-100%  |
| <b>Operating RH Range:</b>   | 0 to 95% RH, non-condensing (Conformally Coated PCB's)  |
| <b>Operating Temperature Range:</b>  | -40 to 140°F (-40 to 60°C)  |
| <b>Storage Temperature Range:</b>  | -40 to 149°F (-40 to 65°C)  |
| <b>RH Stability   Repeatability   Sensitivity:</b>                                     | Less than 2% drift / 5 years   0.5% RH   0.1% RH  |
| <b>RH Response Time (T63):</b>   | 20 Seconds Typical  |
| <b>RH Sensor Type:</b>   | Capacitive with Hydrophobic Filter  |
| <b>RH Transmitter Stabilization Time:</b>  | 30 Minutes (Recommended time before doing accuracy verification)  |
| <b>RH Connections   Wire Size:</b>   | Screw Terminal Blocks (Polarity Sensitive)   16 (1.31 mm <sup>2</sup> ) to 26 AWG (0.129 mm <sup>2</sup> )  |
| <b>RH Terminal Block Torque Rating:</b>  | 4.43 to 5.31 lb-in (0.5 to 0.6 Nm)  |
| <b>RH NIST Test Points:</b>  | <b>Default Test Points:</b> 3 Points (20%, 50% & 80%)<br><b>1% NIST Test Points:</b> 5 Points within selected 20% Range (ie. 30%-50% are 30, 35, 40, 45 & 50)   |
| <b>Nickel RTD (PTC) Output @70°F (21.1°C)<br/>(Wire Colors):</b>                       | <b>RHx-1K-NI-D Series:</b> 1000 Ohms nominal (1K-Nickel RTD)   Red/Red  |
| <b>Nickel RTD Sensor Accuracy:</b>   | 32°F (0°C): +/-0.72°F (0.4°F); 70°F (21.1°C): +/-0.34°F (0.17°C); 130°F (54.4°C): +/-1.00°F (0.56°C)  |
| <b>Nickel RTD Din Standard:</b>  | Din 43760   |
| <b>Temperature Coefficient:</b>  | 6370 ppm/ °C  |
| <b>Nickel RTD Stability:</b>   | +/-0.05% after 1000 Hours @ 302°F (150°C)   |
| <b>Lead Wire Length   Conductor Size:</b>  | 14" (35.6 cm)   22 AWG (0.65 mm)  |
| <b>Insulation   Rating:</b>  | Etched Teflon (PTFE) Colored Leads   Mil Spec 16878/4 Type E  |
| <b>Enclosure Specifications (Material, Flammability, Temperature, NEMA/IP Rating):</b> | <b>"-EH" Enclosure:</b> ABS Plastic   UL94-V0   -40 to 140°F (-40 to 60°C)<br><b>"-4X" Enclosure:</b> Polystyrene Plastic   UL94-V2   -40 to 158°F (-40 to 70°C)   NEMA 4X (IP 66)<br><b>"-BB" Enclosure:</b> Aluminum   -40 to 140°F (-40 to 60°C) |
| <b>Sensing Tube Material   Filter Material:</b>  | <b>"EH" Enclosure:</b> 304 Series Stainless Steel   304 Series Stainless Steel<br><b>"-4X" Enclosure:</b> Schedule 40 PVC (White)   Slotted PVC without filter<br><b>"-BB" Enclosure:</b> Schedule 40 PVC (White)   Slotted PVC without filter      |
| <b>Sensing Tube Dimensions (Length x Diameter):</b>                                    | <b>"-EH" Models with Sintered Filters:</b> 7.75" (196.85 mm) x 0.75" (19.05 mm)<br><b>"-4X" Models:</b> 7.20" (182.88 mm) x 0.840" (21.34 mm)<br><b>"-BB" Enclosure:</b> 7.20" (182.88 mm) x 0.840" (21.34 mm)                                      |
| <b>Product Dimensions (L x W x H):</b>   | See drawings on back of data sheet  |
| <b>Product Weight:</b>   | <b>A/RHx-1K-NI-D Series:</b> 1.22 lbs. (0.55 kg)   <b>A/RHx-1K-NI-D-4X Series:</b> 0.50 lbs. (0.227 kg)   <b>A/RHx-1K-NI-D-BB Series:</b> 0.90 lbs. (0.41 kg)   |
| <b>Agency Approvals:</b>   | UKCA, CE, RoHS, WEEE  |



**DIMENSIONAL DRAWING**

|  |  |  |
|--|--|--|
| <p><b>Euro Enclosure [EH]</b></p>  <p>4.30"<br/>(109.22mm)</p>                          |  <p>7.94" (201.60mm)</p> <p>2.12" (53.72mm)</p> <p>Ø0.75"<br/>(19.05mm)</p> |   |
| <p><b>NEMA 4X Enclosure [4X]</b></p>  <p>2.55"<br/>(64.77mm)</p> <p>3.70" (93.98mm)</p> |  <p>Ø1.16"<br/>(29.50mm)</p> <p>2.23" (56.71mm)</p> <p>7.19" (182.56)</p>   |   |
| <p><b>NEMA 3R Enclosure [D-BB]</b></p>  <p>[119.50]<br/>4.70</p> <p>[75]<br/>2.95</p>  |  <p>[21.34]<br/>Ø.84</p> <p>[29.54]<br/>1.16</p>                           |  <p>[161.29]<br/>6.35</p> <p>[180.09]<br/>7.09</p> <p>[57.93]<br/>2.28</p> |
| <p><b>Front View</b></p>   | <p><b>Right View</b></p>   | <p><b>Top View</b></p>   |

**CUSTOM ORDERING**

Model # Example: **A/** **RH2** **1K-NI** **D** **NIST**

**MODEL #**

|   |  |              |
|---|--|--------------|
| <p><b>A. Sensor Series</b> No Selection Required</p>        | <p>A/ →</p>  | <p>A/</p>    |
| <p><b>B. Accuracy</b> Select One (1)</p>                    | <p>RH1 = +/-1% (Specify a 20% Range between 20 to 90% RH)   RH2 = +/-2%   RH3 = +/-3%</p>            |              |
| <p><b>C. Temperature Sensor</b> No Selection Required</p>   | <p>1K-NI →</p>   | <p>1K-NI</p> |
| <p><b>D. Configuration</b> Select One (1)</p>               | <p>D = Duct (Euro Enclosure)   D-4X = Duct (NEMA 4X Enclosure)   D-BB = Duct (NEMA 3R Enclosure)</p> |              |
| <p><b>E. Output Signal</b> Select One (1)</p>               | <p>---- = 4 to 20 mA (Default)   0 to 10 VDC (Field Selectable)   0 to 5 VDC (Field Selectable)</p>  |              |
| <p><b>F. NIST (Temperature &amp; RH)</b> Select One (1)</p> | <p>---- = No NIST Certificate   NIST = NIST Certificate (3 Points)</p>                               |              |

**Note:** Outputs are field selectable between 4-20 mA, 0-5 VDC & 0-10 VDC

**ACCESSORIES ORDERING**

Model # Example: **A/SINTERED FILTER**

| Model #           | Item # | Description   |
|-------------------|--------|---|
| A/SINTERED FILTER | 143433 | 3/8" Sintered Filter for RH Duct/Stainless Plate/Remote Probe |