# INSTALLATION INSTRUCTIONS

# RH Sensor Replacement HSD - For Duct Transmitters



#### **IMPORTANT HANDLING PRECAUTIONS:**

RH Sensors are composed of a polymer material that is prone to contamination by vapors from soldering, solvents, and outgassing of tapes and glues. Care must be taken to prevent sensor exposure to contaminants. Exposure to dust from sanding or grinding must also be avioded. Store sensor in factory packaging until time of installation.

## **IMPORTANT WARNINGS**

- Only qualified trade installers should install this product
- This product is not intended for life-safety applications
- · Do not install in hazardous or classified locations
- The installer is responsible for all applicable codes
- De-energize power supply prior to installation or service

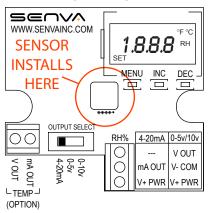
#### PRODUCT APPLICATION LIMITATION:

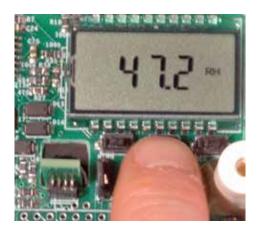
Senva products are not designed for life or safety applications. Senva products are not intended for use in critical applications such as nuclear facilities, human implantable device or life support. Senva is not liable, in whole or in part, for any claims or damages arising from such uses.

### **INSTALLATION**

- 1. Power transmitter OFF before replacing sensor.
- 2. Loosen lid screws to remove cover.
- 3. Gently pull circuit board tab to remove sensor.
- 4. Carefully install new sensor making sure to fully engage pin and socket connection.
- 5. Replace cover and re-power sensor.

#### **RH/T DUAL TRANSMITTER**





### **SETUP**

In normal operation, display toggles between RH% and Temp.

Press MENU button to select parameter to set:

Temp units °F or °C

RH offset\* -5 to 5% RH in 0.1% RH increments

Temp offset -5 to 5° in 0.1° increments

Press INC or DEC to change value of selected parameter. Press MENU button to move to next parameter. Settings are saved automatically.

\* See CALIBRATION section prior to making adjustments to RH offset.



Power supply         3-wire voltage mode (0-5v/10v) 2-wire current mode (4-20mA)         12-30vdc/24vac (¹), 15mA max.           Outputs         RH and Temperature (option)         12-30vdc, 30mA max.           Output scaling         RH and Temperature (option)         abile 0-5v/10v (⁴) or 2-wire 4-20mA (selectable) abile 0-3bile		SPECIFICATIONS	
Outputs         RH and Temperature (option)         3-wire 0-5v/10v <sup>(4)</sup> or 2-wire 4-20mA (selectable) able)           Output scaling         RH         0-100%RH           Thermistor/RTD options         See ordering table           Media filter         Sintered stainless steel           Resolution         0.05%RH           Hysteresis         +/-1%RH           Non-linearity         Factory linearized <1%RH           Temperature coefficient         Fully compensated by on-board sensor           Response time <sup>(2)</sup> 30s           Output update rate         2s           Operating range         0 to 100%RH           Operating conditions <sup>(3)</sup> −20 to 60°C @RH >90%           Operating conditions <sup>(3)</sup> −20 to 70°C @RH = 50%           Temperature         Resolution         0.01°C           Temperature         Resolution         0.01°C           Temperature         Resolution         0.01°C           Response time <sup>(2)</sup> 30s           30m models, <+/th>         +/-1°C; 0.5°C type25°C           31m models, <+/th>         -/-1°C; 0.5°C type25°C           32m models, <+/th>         -/-1°C; 0.5°C type25°C           32m models, <+/th>         -/-1°C; 0.5°C type25°C           32m models, <+/th>         -/-2°C; 0.5°C type25	Power supply		
MR         0-100%RH           Temperature (jumper selectable)         32-122°F (0-50°C) or -40-140°F (-40-60°C)           Thermistor/RTD options         See ordering table           Media filter         2% models, +/-2% over 10 to 90% range           Resolution         0.05%RH           Multipate reliable         4/-19kRH           Mon-linearity         Factory linearized <19kRH		2-wire current mode (4-20mA)	12-30vdc, 30mA max.
Output scaling         Temperature (jumper selectable)         32-122° (0-50°C) or -40-140°F (-40-60°C)           Thermistor/RTD options         See ordering table           Media filter         Sintered stainless steel           Resolution         2% models, +/-2% over 10 to 90% range           3% models, +/-3% over 20 to 80% range         3% models, +/-3% over 20 to 80% range           Resolution         0.05%RH           Non-linearity         Factory linearized <1%RH	Outputs	RH and Temperature (option)	
Temperature (jumper selectable)   32-122*F (0-50°C) or -40-140°F (-40-60°C)     Thermistor/RTD options   See ordering table     Media filter   Sintered stainless steel     Accuracy   2% models, +/-2% over 10 to 90% range     3% models, +/-3% over 20 to 80% range     3% models, +/-3% over 20 to 80% range     Accuracy   Resolution   0.05%RH     Hysteresis   +/-1%RH     Non-linearity   Factory linearized <1%RH     Temperature coefficient   Fully compensated by on-board sensor     Response time (2)   30s     Output update rate   2s     Operating range   0 to 100%RH     Long term drift   <0.5%RH per year     Congreting conditions (3)   -20 to 70°C @ RH >90%     -20 to 70°C @ RH > 50%     Accuracy, (-20 to 700C range)   2% models, <+/-1°C; 0.5°C typ@25°C     3% models, <+/-2°C; 0.5°C typ@25°C     Resolution   0.01°C     Response time (2)   30s     Output update rate   2s     2% models, <-/->   2% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models, <-/->   -2°C; 0.5°C typ@25°C     3% models, <-/->   3% models,	Output scaling	RH	0-100%RH
Media filter       Sintered stainless steel         2% models, +/-2% over 10 to 90% range       2% models, +/-2% over 10 to 90% range         3% models, +/-3% over 20 to 80% range       3% models, +/-3% over 20 to 80% range         Resolution       0.05%RH         Hysteresis       +/-1%RH         Non-linearity       Factory linearized <1%RH		Temperature (jumper selectable)	32-122°F (0-50°C) or -40-140°F (-40-60°C)
Real Accuracy         Accuracy         2% models, +/-2% over 10 to 90% range           Resolution         0.05%RH           Hysteresis         +/-1%RH           Non-linearity         Factory linearized <1%RH	Thermistor/RTD options		See ordering table
Accuracy         3% models, +/-3% over 20 to 80% range           Resolution         0.05%RH           Hysteresis         +/-1%RH           Non-linearity         Factory linearized <1%RH	Media filter		Sintered stainless steel
Resolution	Relative Humidity	Accuracy	2% models, +/-2% over 10 to 90% range
$\begin{tabular}{ l l l l l l l l l l l l l l l l l l l$			3% models, +/-3% over 20 to 80% range
Non-linearity Factory linearized <1%RH  Temperature coefficient Fully compensated by on-board sensor  Response time (2) 30s  Output update rate 2s  Operating range 0 to 100%RH  Long term drift <0.5%RH per year  -20 to 60°C @ RH >90%  -20 to 70°C @ RH = 50%  Resolution 0.01°C  Temperature  Repeatability +/-0.1°C  Response time (2) 30s  Output update rate 2s  Operating conditions (3) -20 to 70°C typ@25°C  Response time (2) 30s  Output update rate 2s		Resolution	0.05%RH
Relative HumidityTemperature coefficientFully compensated by on-board sensorResponse time $(2)$ 30sOutput update rate2sOperating range0 to 100%RHLong term drift<0.5%RH per year		Hysteresis	+/-1%RH
Relative Humidity $ \begin{array}{c} \text{Response time}^{(2)} & 30\text{s} \\ \\ \text{Output update rate} & 2\text{s} \\ \\ \text{Operating range} & 0 \text{ to 100\%RH} \\ \\ \text{Long term drift} & <0.5\%RH per year \\ \\ -20 \text{ to } 60^{\circ}\text{C @ RH} > 90\% \\ \\ -20 \text{ to } 70^{\circ}\text{C @ RH} = 50\% \\ \\ \text{Propositing conditions}^{(3)} & 2\% \text{ models, } <+/-1^{\circ}\text{C; } 0.5^{\circ}\text{C typ@25^{\circ}\text{C}} \\ \\ \text{Resolution} & 0.01^{\circ}\text{C} \\ \\ \text{Response time}^{(2)} & 30\text{s} \\ \\ \text{Output update rate} & 2\text{s} \\ \\ \end{array} $		Non-linearity	Factory linearized <1%RH
Response time   2    30s     Output update rate   2      Operating range   0 to 100%RH     Long term drift   <0.5%RH per year     Operating conditions   (3)   -20 to 60°C @ RH >90%     -20 to 70°C @ RH = 50%     Response time   (2)   30s     Output update rate   2      Output update rate   3      Output upd		Temperature coefficient	Fully compensated by on-board sensor
		Response time (2)	30s
		Output update rate	2s
		Operating range	0 to 100%RH
Operating conditions (3) $-20 \text{ to } 70^{\circ}\text{C} \otimes \text{RH} = 50\%$ $Accuracy, (-20 \text{ to } 70^{\circ}\text{C} \text{ range})$ $2\% \text{ models, <+/-1^{\circ}\text{C}; 0.5^{\circ}\text{C} \text{ typ@25^{\circ}\text{C}}}$ $3\% \text{ models, <+/-2^{\circ}\text{C}; 0.5^{\circ}\text{C} \text{ typ@25^{\circ}\text{C}}}$ $Resolution \qquad 0.01^{\circ}\text{C}$ $Repeatability \qquad +/-0.1^{\circ}\text{C}$ $Response time (2) \qquad 30s$ $Output update rate \qquad 2s$		Long term drift	<0.5%RH per year
-20 to 70°C @ RH = 50%  Accuracy, (-20 to 70°C Tange)  Accuracy, (-20 to 70°C Tange)  Resolution  Temperature  Repeatability  +/-0.1°C  Response time (2)  Output update rate  -20 to 70°C @ RH = 50%  2% models, <+/-1°C; 0.5°C typ@25°C  3% models, <+/-2°C; 0.5°C typ@25°C  3% models, <+/-2°C; 0.5°C typ@25°C  3% models, <+/-2°C; 0.5°C typ@25°C  3% models, <-/-2°C; 0.5°C typ@25°C  4% models, <-/-2°C; 0.5°C typ@25°C  2% models, <-/-2°C; 0.5°C typ@25°C  3% models, <-/-2°C; 0.5°C typ@25°C  3% models, <-/-2°C; 0.5°C typ@25°C  2% models, <-/-2°C; 0.5°C typ@25°C  4% models, <-/-2°C; 0.5°C typ@25°C  5% models, <-/-2°C; 0.5°C typ@25°C  4% models, <-/-2°C; 0.5°C typ@25°C  5% models,		Operating conditions (3)	-20 to 60°C @ RH >90%
Accuracy, (-20 to 70oC range)  Resolution  O.01°C  Repeatability  +/-0.1°C  Response time (2)  Output update rate  2s			-20 to 70°C @ RH = 50%
Temperature  Resolution  Repeatability  Response time (2)  Output update rate  3% models, <+/-2°C; 0.5°C typ@25°C  +/-0.1°C  30s  Output update rate  2s	Temperature	Accuracy, (-20 to 70oC range)	2% models, <+/-1°C; 0.5°C typ@25°C
Repeatability +/-0.1°C Response time (2) 30s Output update rate 2s			3% models, <+/-2°C; 0.5°C typ@25°C
Response time <sup>(2)</sup> 30s Output update rate 2s		Resolution	0.01°C
Output update rate 2s		Repeatability	+/-0.1°C
		Response time (2)	30s
Operating range -40 to 70°C		Output update rate	2s
		Operating range	-40 to 70°C

- (1) One side of transformer secondary is connected to signal common. Dedicated transformer is recommended.
- (2) Time for reaching 63% of reading at 25°C and 1 m/s airflow.
- (3) Long term exposures to conditions outside normal range or high humidity may temprarily offset the RH reading (+3%RH after 60 hours.)
- (4) 15-30VDC/24VAC power supply voltage required for 10V output.

# **TROUBLESHOOTING**

Symptom	Solution	
No output	Check wiring. Ensure power supply meets requirements.	
	Verify control panel software is configured for correct output scaling.	
Temp or RH reading error	Verify accuracy of test instru- ment. Observe installation and calibration guidelines	
	Verify unit is securely installed on duct without excessive air leakage.	
	Perform calibration only if necessary.	
Sensor damage, contamination, or long-term drift	Replace sensor element. Consult factory for ordering information.	

#### **CALIBRATION**

Senva RH sensors are factory calibrated to NIST traceable standards. No field calibration is necessary or recommended. However, to facilitate compliance with job requirements and commissioning procedures, provisions for field calibration are provided:

- 1. Locate calibration instrument and sensor in close proximity to each other in a controlled environment free of drafts, people, and equipment to reduce influence on RH and temperature.
- 2. Compare output of sensor to calibration instrument, and note difference. (In 0-10v mode, 1v = 10%RH)
- 3. Refer to SETUP section to change RH offset as needed. Set RH offset to zero to restore factory calibration.

NOTE: In case of damage, contamination, or long-term drift, sensor element may be replaced. Consult factory for ordering information and instructions.