

225-RHP-2Sxx

User Manual

225-RHP-2S11 (4-20 mA output)

225-RHP-2S33 (0-5 V output)

Temperature and Relative Humidity Transmitter



**225-RHP-2Sxx Transmitter
with
380-RHRS Solar Radiation Shield**

Phone (530) 823-7185

Email nova@novalynx.com **Website** www.novalynx.com

Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

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1 FORWARD

Thank you for purchasing NovaLynx products. NovaLynx has been designing and manufacturing weather instruments since 1988. NovaLynx represents several well-known brands of quality manufacturers, including Gill Instruments, RM Young, Kipp & Zonen, and Vaisala. It is our hope that our products will meet all your monitoring requirements.

2 INTRODUCTION

The **225-RHP-2Sxx Temperature and Relative Humidity Transmitters** are highly accurate and easy to use. The polymer capacitance humidity sensor is not affected by condensation, fog, high humidity, or contaminants. A membrane filter protects both the humidity sensor and the solid state temperature sensor.

The sensor can be used indoors for HVAC monitoring purposes. An optional solar radiation shield (NovaLynx 380-RHRS) protects the sensor from rain and radiated heat when installed outdoors.

The weatherproof enclosure, cord grip cable entry point, and a filter protect the electronics and sensors from environmental or mechanical damage. The mounting bracket fits 3/4" to 1-1/2" iron pipe.

- The **225-RHP-2S11** has 4-20 mA loop powered outputs.
- The **225-RHP-2S33** requires a power supply and outputs 0-5 volt signals

Cable is not included but may be ordered by the foot.

- Recommended cable: NovaLynx **330-0524** (24 AWG, 5-conductor, shielded, with PVC jacket)

3 PRECAUTIONS

WARNING – Disconnect the supply before installation to prevent electrical shock and equipment damage. Follow electrical code requirements.

CAUTION – Use electrostatic discharge precautions (e.g., use of wrist straps) during installation and wiring to prevent equipment damage.

CAUTION – Do not exceed ratings of this device, permanent damage not covered by warranty may result. The 4-20 mA models are not designed for AC voltage operation.

4 SPECIFICATIONS

225-RHP-2Sxx Temperature and Relative Humidity Sensor	
Relative Humidity Range	0 to 100% RH
Temperature Range	-40 to 140°F (-40 to 60°C)
Accuracy, RH	±2% 10 to 90% RH @ 25°C
Accuracy, Temperature	±0.9°F @ 72°F (±0.3°C @ 25°C)
Hysteresis	±1%
Repeatability	±0.1% typical
Temperature Limits	-40 to 140°F (-40 to 60°C)
Storage Temperature	-40 to 176°F (-40 to 80°C)
Compensated Temperature Range	-4 to 140°F (-20 to 60°C)
Power Requirements	225-RHP-2S11: 10 to 35 VDC; Output signal: 4 to 20 mA (loop powered).
	225-RHP-2S33: 15 to 35 VDC or 15 to 29 VAC; Output signal: 0 to 5 V @ 5 mA max.
Response Time	15 seconds
Electrical Connections	Removable screw terminal block
Drift	<1% RH/year
RH Sensor	Capacitance polymer
Temperature Sensor	Solid state band gap
Enclosure / Rating	Polycarbonate / NEMA 4X (IP65)
Cable	not included
Weight / Shipping	Transmitter only: 1 lb (.45 kg) / 2 lbs (.9 kg)
	Transmitter and Solar Radiation Shield: 2 lbs (.9 kg) / 3 lbs (1.4 kg)
Agency Approvals	CE

5 INSTALLATION

5.1 Outdoors

For outdoor applications, use the U-bolt to clamp the sensor to a vertical pipe up to 1 ½" (38mm) in diameter. The **380-RHRS Solar Radiation Shield** must be in place to protect the tip of the probe from rain or sunshine. Remove the cover of the enclosure, then route your cable through the cord grip on the bottom of the enclosure. Follow the wiring diagram to make the connections to the screw terminal block, then tighten the cord grip, leaving some slack inside. Use cable ties to secure the cable to the support pipe. Complete the installation by connecting to your monitoring system.

5.2 Indoors

The sensor may be mounted indoors without a solar radiation shield. It should be mounted in a location that receives adequate air flow for proper operation. The transmitter should be mounted such that the cord grip points down to prevent moisture from entering. The U-bolt can be removed and the mounting bracket bolted to a wall or post.

5.3 Duct Mount

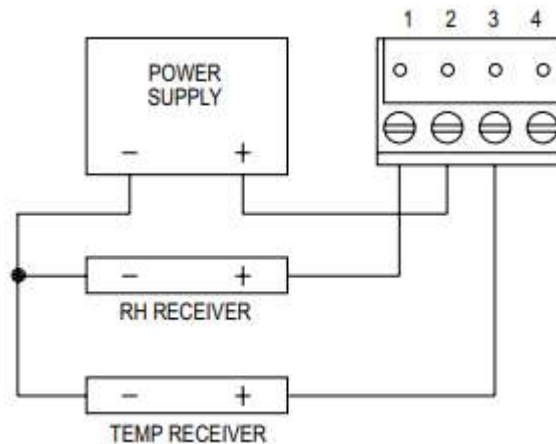
The tip of the probe is sometimes inserted into an HVAC duct. In this application, drill a 1" diameter hole in the duct at the desired location (away from fans, corners, heating and cooling coils, and other equipment that will affect the measurement of the relative humidity). Insert the probe until the

mounting flange is flush to the duct. Run one or two straps (or long cable ties) around the duct to hold the enclosure in place.

6 WIRING

6.1 Dual 4-20 mA Output Wiring (Model 225-RHP-2S11)

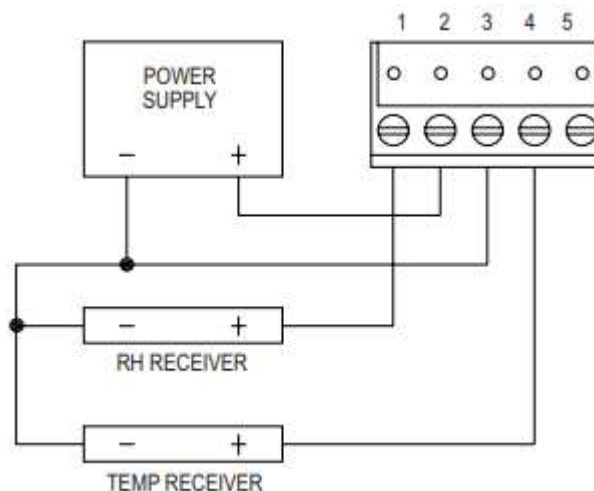
Dual 4-20 mA output units may be powered with a 10-35 VDC supply. The transmitter is designed as a 2-wire 4-20 mA device with two channels. The channels are common on the positive side of the current loop. Sensor excitation power is derived from the RH channel, so power must always be applied to that channel. If the temperature channel is not used, it can be left disconnected.



Note: If the RH output is not required, wire the “-” terminal of the power supply to terminal 1.

6.2 Dual 0-5 V Output Wiring (Model 225-RHP-2S33)

Dual 0-5 V units may be powered with 15-35 VDC or 15-29 VAC. Note polarity when using DC power. The channels are common on the negative side. If desired, the RH or temperature output may be used by itself.



7 TROUBLESHOOTING

If the sensor's output signal appears to be in error or is absent, check the power connections. At the sensor cable, measure the battery or the input power source voltage with a voltmeter. Be sure that the instrument has been powered up correctly or wait for the next power ON cycle to occur. Check any batteries to be sure that they have sufficient charge and an adequate voltage level to power the instrument and that all connections are secure. Inspect the battery terminals to ensure that they are clean and solidly connected to the battery.

7.1 Troubleshooting 4-20 mA Models

Verify appropriate supply voltage. The transmitter requires a minimum of 10 and a maximum of 35 VDC at its connection for proper operation. Choose a power supply with a voltage and current rating which meets this requirement under all operating conditions. If the power supply is unregulated, make sure voltage remains within these limits under all power line conditions. Ripple on the supply should not exceed 100 mV.

Loop Resistance – The maximum allowable loop resistance depends on the power supply voltage. Maximum loop voltage drop must not reduce the transmitter voltage below the 10 VDC minimum. Maximum loop resistance can be calculated with the following equation. V_{ps} is the power supply voltage.

$$R_{max} = \frac{V_{ps} - 10.0}{20 \text{ mA}}$$

Some receivers, particularly loop powered indicators, may maintain a fixed loop voltage to power the device. This voltage drop must also be subtracted from the power supply voltage when calculating the voltage margin for the transmitter. The following equation takes this into account. V_{rec} is the receiver fixed voltage.

$$R_{max} = \frac{V_{ps} - 10.0 - V_{rec}}{20 \text{ mA}}$$

7.2 Troubleshooting 0-5 V Output Models:

Verify appropriate supply voltage. The 0-5 V output requires a DC supply of 15-35 V or an AC supply of 15-29 V for proper operation maximum. Maximum output load is 5 mA.

7.3 Determining the Source of a Failure

The sensor is one part of the measurement system, and it is possible that the logger or PLC that the sensor is being used with is actually the cause of a problem. If the problem cannot be located using the

techniques above, then disconnect the Temperature/Humidity sensor from the monitoring system and test it independently, using a power source and a digital voltmeter.

Refer to the appropriate wiring diagram (Section 6) and set up your meter to read either mA or volts accordingly. Supply power to the transmitter circuit board and then measure the output of the board. Take note of the reading, then try to vary the reading.

- To increase the humidity reading, breathe on the humidity sensor while watching for a change in the meter reading. The change may take 10 to 40 seconds.
- To increase the temperature reading, hold the probe in your hand for several seconds.

If no change is observed, unscrew the filter from the top of the probe and try again.

8 MAINTENANCE

No routine maintenance is required; however, a periodic check of the system calibration is recommended. The Series RHP is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void the warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.