ohmic instruments co.
508 August St. Easton, MD
21601
Voice: (410) 820-5111
Fax: (410) 822-9633
www.ohmicinstruments.com

SC-500

RESISTIVE RELATIVE HUMIDITY SENSOR AND SIGNAL CONDITIONING CIRCUIT APPLICATION NOTES

SC-500man.PUB Rev. 0 2/27/06

UPS-500 SENSOR PRECAUTIONS

DC Voltage:
Never apply a DC voltage to the UPS-500. Only a symmetrical AC excitation voltage under 6V AC should be used. The nominal frequency should be between 33 and 1000 Hz. The excitation can be a saw tooth, square, or sine wave with no DC bias. DC voltage (including DC pulses) will polarize the sensor, resulting in an irreversible shift. Never connect the sensor to an ohmmeter.

Condensation, Fog, Mist or Liquid Water:
The polymer coating of the UPS-500 allows it to be exposed to condensation with recovery after the sensor dries out. The dry out period may take several minutes; however, there will not be a permanent shift in the impedance. Air movement facilitates faster dry out. Immersion in water or any other liquid is not recommended.

Temperature Limits:
The operating temperature limit for the UPS-500 is –4°F to +140°F.

Chemical Vapors:
Alcohols and other polar compounds typically cause a temporary shift. Reactive chemicals such as sulfides, halogens, mercury vapor, acids and ketones should be avoided. Hydrocarbons or oil mist tend to condense as a varnish which slows the response time of the sensor.

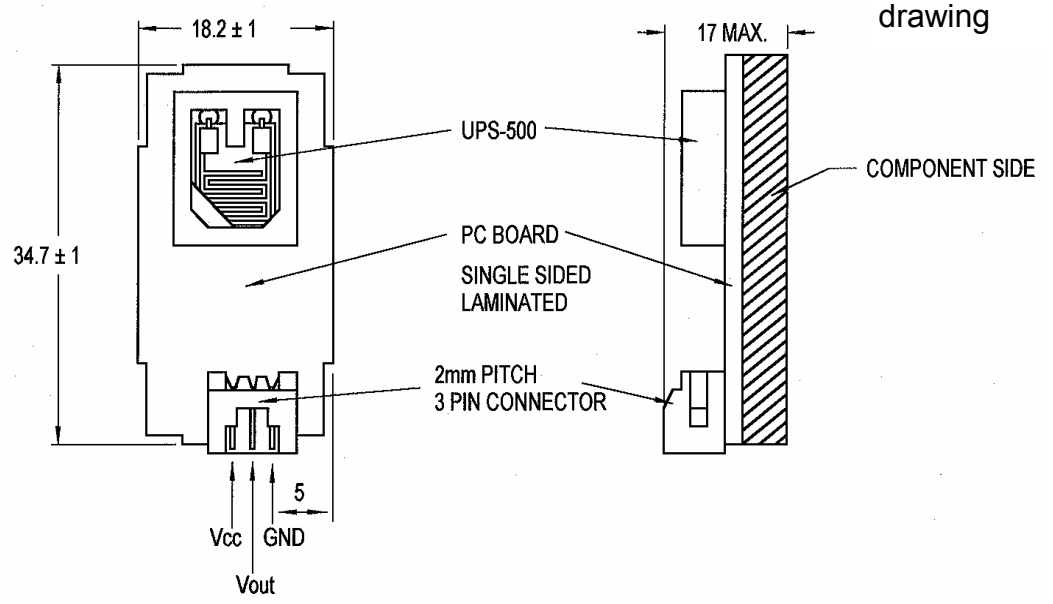
Physical Contaminants:
When used in environments with dust and oil mist, a filter must be utilized. The UPS-500 may be used at high static pressures (>6000 psi). High absolute vacuum should be avoided.

Installation of Sensors:
Sensors must be hand soldered. A heat sink should be used on the sensor legs when soldering to prevent excessive heat from reaching the pad on the sensor body. Carefully clean solder excess with a solder cleaner, but do not get any cleaner on the sensor itself.

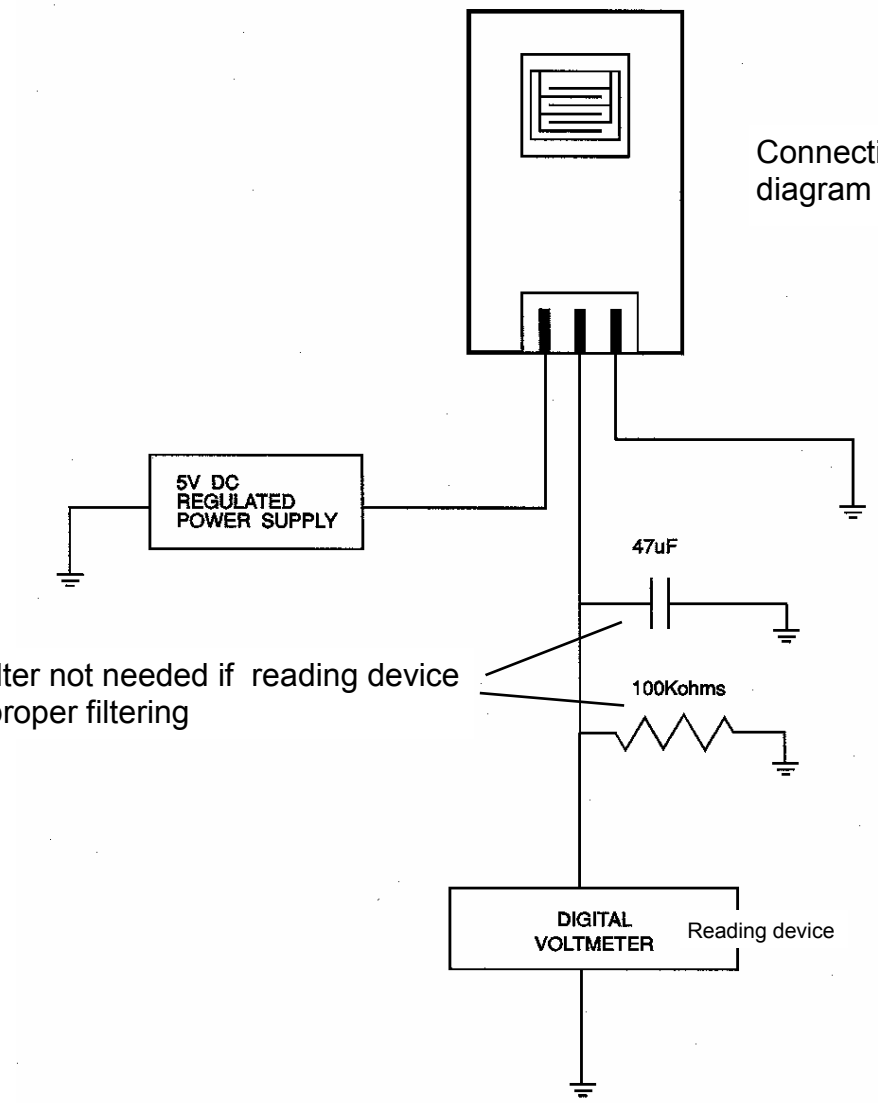
SPECIFCATIONS

Range	20-90% RH (Non-condensing)
Set Point Accuracy	±2 %RH
Output Signal	1 to 3 Vdc
Operating Temperature	4 to +140ºF
Hysteresis	+/-1% RH
Long-Term Drift	< 2% RH/5 Years
Sensor Excitation	150mVac RMS @ 3.8 kH
Power	5 Vdc (Regulated) current < 1.5 mA max.
Output Filter	100KΩ/47μF RC filter
Dimensions	0.71 x 1.38 x 0.67 in. (18 x 35 x 17mm)

Dimensional drawing

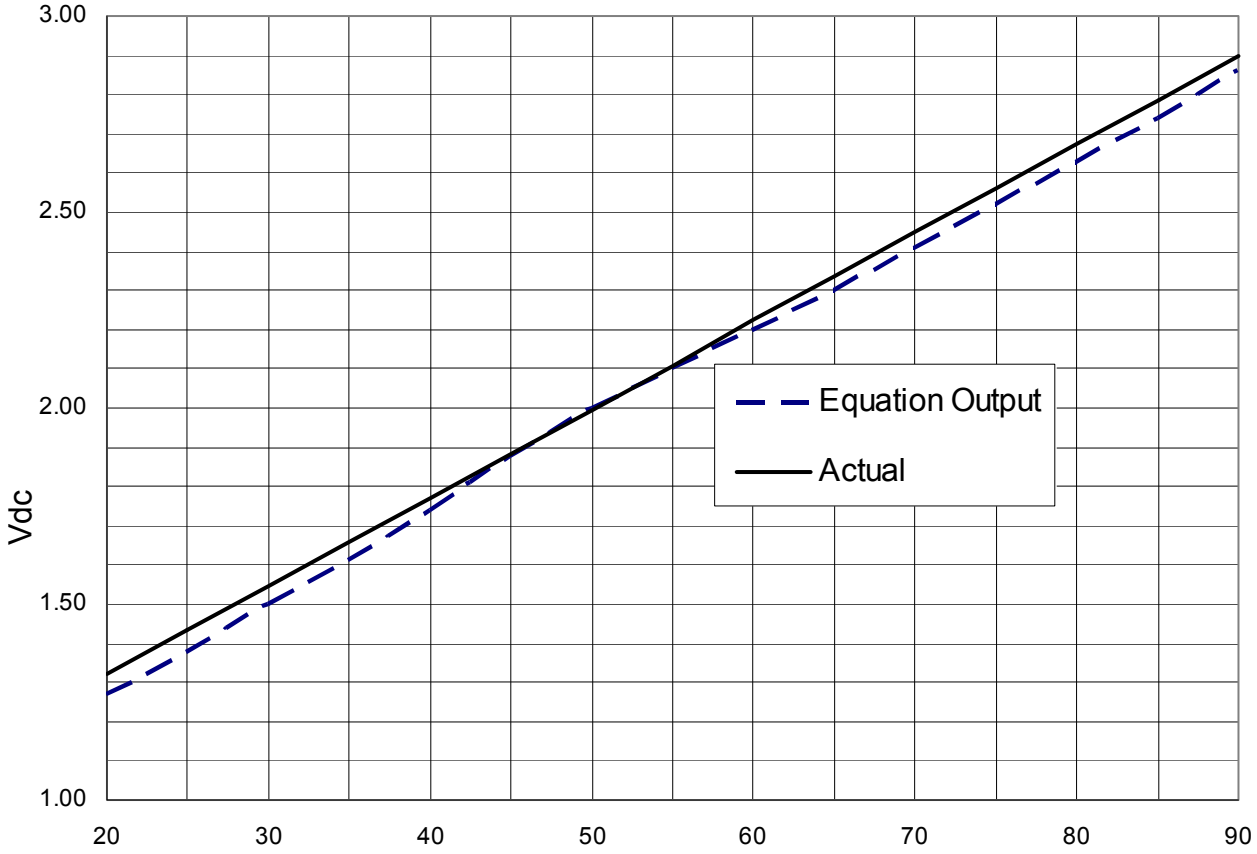


Connection diagram



RC filter not needed if reading device has proper filtering

Vdc vs. %RH @ 25°C (77°F)



Output Equations
Vdc = (.0225 x %RH) + 0.872 If the temperature is not 25°C (77°F) the temperature compensation equation should be included to correct the %RH value before calculating the Voltage Output Equation.

%RH = 44.5113 V –38.895 If the temperature is not 25°C (77°F) the temperature compensation equation should be performed on the answer to the %RH Output Equation.

Temperature Compensation
The average coefficient for temperature compensation of the UPS-500 sensor works out to -0.7% RH/ °C (-0.4% RH/ °F). The correction factor is computed with the expression:

C = -0.7(T-25)
C = the correction factor in percent to be algebraically added.
T = the temperature in °C.

C = -0.4(T-77)
C = the correction factor in percent to be algebraically added.
T = the temperature in °F.