

## HW2200

### Relative Humidity Module

#### Specifications

- Small size product
- Product free from Lead, Cr(6+), Cd and Hg
- Humidity calibrated within +/-3% @55%RH
- Typical 1 to 3.6 Volt DC output for 0 to 100% RH at 5Vdc supply
- Ratiometric to voltage supply from 4.75Vdc to 5Vdc

#### Description

Based on the capacitive polymer RH Sensor developed by Samyoung S&C, HW2200 is a dedicated humidity transducer designed for OEM applications where a reliable and accurate measurement is needed. Direct interface with a micro-controller is made possible with the module's linear voltage output



#### Features

- Full interchangeability
- High reliability and long term stability
- Waterproof design(IP67)
- Very low temperature dependence
- Suitable for 3 to 10 Vdc supply voltage

#### Applications

- Industrial
- Process control

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## Performance Specs

### MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Storage Temperature	Tstg	-40 to 70	°C
Storage Humidity	RHstg	0 to 100	% RH
Supply Voltage (Peak)	Vs	10	Vdc
Humidity Operating Range	RH	0 to 100	% RH
Temperature Operating Range	Ta	-40 to 60	°C

## Electrical Characteristics

(Ta=23°C, Vs=5Vdc +/-5%, RL>1MΩ unless otherwise stated)

Humidity Characteristics	Symbol	Min	Typ	Max	Unit
Humidity Measuring Range	RH	0		100	%RH
Relative Humidity Accuracy (10 to 95% RH)	RH		+/-3	+/-5	%RH
Supply Voltage (regulated at 5Vdc*)	Vs		5		Vdc
Nominal Output @55%RH (at 5Vdc)	Vout	2.42	2.48	2.54	V
Current consumption	Ic		1.4	2	mA
Temperature Coefficient (10 to 50°C)	Tcc		- 0.05	-0.1	%RH/°C
Average Sensitivity from 33% to 75%RH	$\Delta V_{out}/\Delta RH$		+26		mV/%RH
Sink Current Capability (RL=33kΩ)	Is			150	μA
Humidity Hysteresis				+/-2	%RH
Time Constant (at 63% of signal, static) 33% to 75%RH	$\tau$			15	s
Warm up time (electronic)	tw		150		ms
Humidity resolution			0.4		%RH
Output Impedance	Z				Ω

## Typical Performance Curves

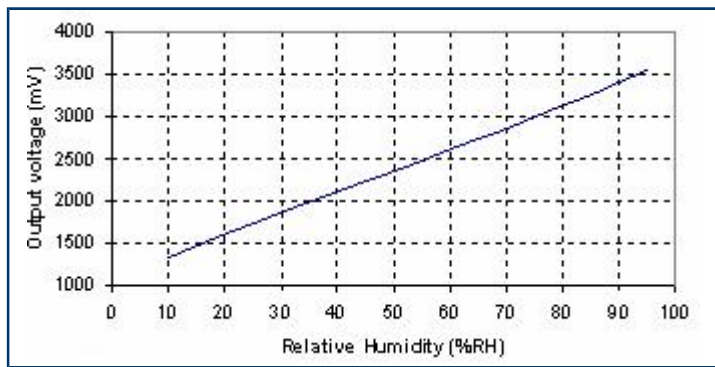
### HUMIDITY SENSOR

- Measurement conditions

HW2200 is specified for accurate measurements within 10 to 95% RH.

Excursion out of this range (<10% or >95% RH, including condensation) does not affect the reliability of HW2200 characteristics.

- Signal Output



RH (%)	Vout (mV)	RH (%)	Vout (mV)
10	1325	55	2480
15	1465	60	2605
20	1600	65	2730
25	1735	70	2860
30	1860	75	2990
35	1990	80	3125
40	2110	85	3260
45	2235	90	3405
50	2360	95	3555

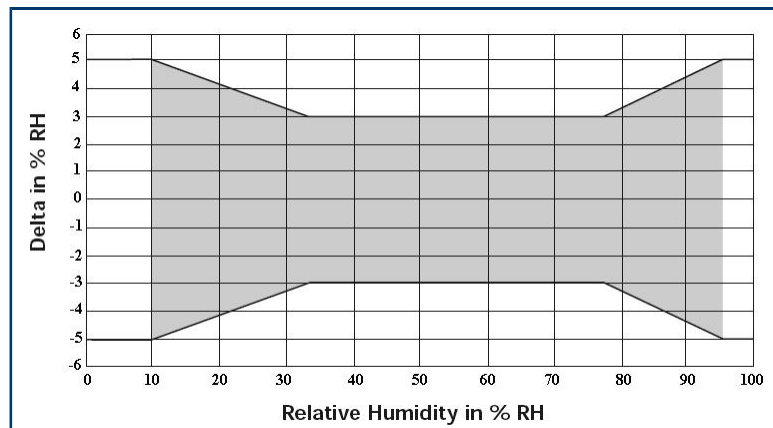
#### LINEAR EQUATIONS:

- $V_{out} = 25.68RH + 1079$
  - $RH = 0.03892 V_{out} - 42.017$
- (With  $V_{out}$  in mV and RH in %)

#### POLYNOMIAL EQUATIONS:

- $V_{out} = 9E^{-4} RH^3 - 1.3E^{-1} RH^2 + 30.815 RH + 1030$
  - $RH = -1,91E^{-9} V_{out}^3 + 1,33E^{-5} V_{out}^2 + 9,56E^{-3} V_{out} - 2,16E^{+1}$
- (With  $V_{out}$  in mV and RH in %)

- Error Budget at 23°C



TEMPERATURE COMPENSATION:

$$RH_{\text{compensated}} = RH_{\text{actual at } T} + (T - 23) \times 0.05$$

(With  $T$ : Temperature in °C and  $RH$ : Relative Humidity in %)

## Qualification Process

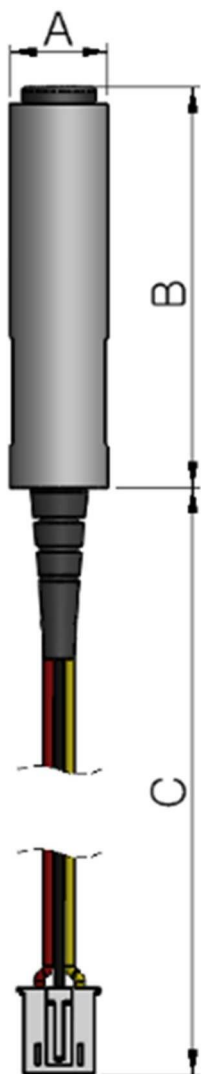
### RESISTANCE TO PHYSICAL AND CHEMICAL STRESSES

- HW2200 has passed through qualification processes of MEAS-FRANCE including vibration, shock, storage, hightemperature and humidity, ESD.
- Additional tests under harsh chemical conditions demonstrate good operation in presence of salt atmosphere, SO2 (0.5%), H2S (0.5%), O3, NOx, NO, CO, CO2, Softener, Soap, Toluene, acids (H2SO4, HNO3, HCl), HMDS, Insecticide, Cigarette smoke, this is not an exhaustive list.
- HW2200 is not light sensitive.

### SPECIFIC PRECAUTIONS

- HW2200 is protected against reversed polarity.
- If you wish to use HW2200 in a chemical atmosphere not listed above, consult us.

## Package Outline



Dimension

Dim	Typ (mm)	Max (mm)
A	11.5	
B	48	
C	235	250

Cable

Wire	Color	Function
W1	Red	Supply Voltage
W2	Yellow	Output(Relative Humidity)
W3	Black	Ground

## Revision History

Date	Version	Page(s)	Changes
2024.06.14	1.0		First Release
2024.07.05	1.1	1, 3,5	Data errors revised