HM1500LF – Relative Humidity Module

- **Small size product**
- **Product free from Lead, Cr(6+), Cd and Hg**
- **Humidity calibrated within +/-2% @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**
- **Patented solid polymer structure**

DESCRIPTION

Based on the rugged HS1101LF capacitive humidity sensor, HM1500LF 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
- Not affected by water immersion
- Very low temperature dependence
- Suitable for 3 to 10 Vdc supply voltage

APPLICATIONS

- Industrial
- Process control
- …

Humidity Sensor Specific features

Instantaneous de-saturation after long periods in saturation phase

Fast response time

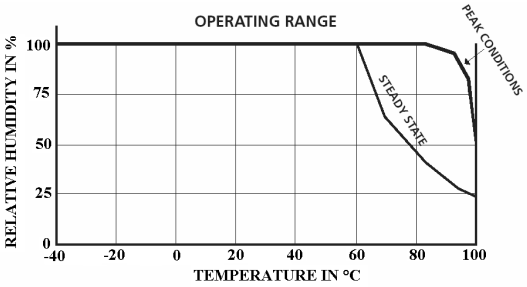
Part could be washed with distilled water

(1) Soldering temperature profiles available on request / contact us at humidity.application@meas-spec.com

PERFORMANCE SPECS

MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Storage Temperature	Tstg	-30 to 70	℃
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	℃



ELECTRICAL CHARACTERISTICS

(Ta=23℃, Vs=5Vdc +/-5%, R_L>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℃)	Tcc		- 0.05	-0 .1	%RH/℃
Average Sensitivity from 33% to 75%RH	ΔVout/ΔRH		+26		mV/%RH
Sink Current Capability (R_L=33kΩ)	Is			150	µA
Humidity Hysteresis				+/-1	%RH
Time Constant (at 63% of signal, static) 33% to 75%RH	τ			10	s
Warm up time (electronic)	tw		150		ms
Humidity resolution			0.4		%RH
Output Impedance	Z		70		Ω

**Maximum power supply ramp up time to Vcc should be less than 4ms.*

TYPICAL PERFORMANCE CURVES

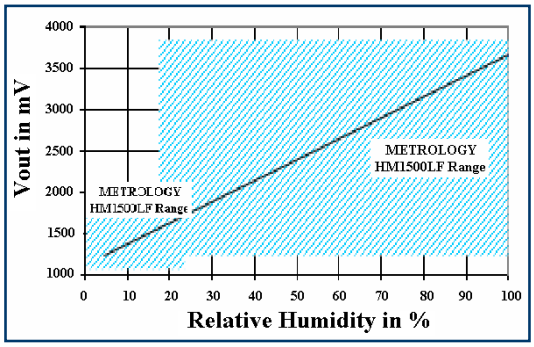
HUMIDITY SENSOR

- **Measurement conditions**

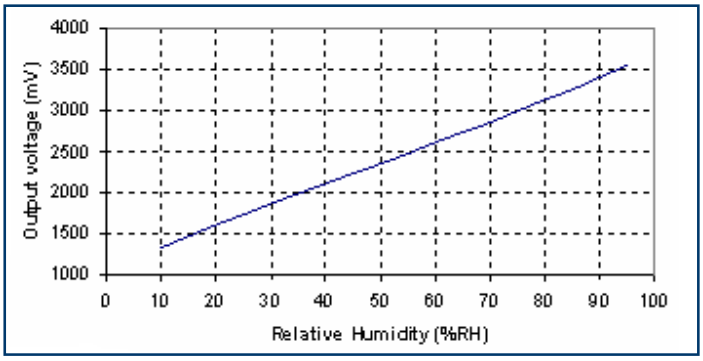
HM1500LF is specified for accurate measurements within 10 to 95% RH.

Excursion out of this range (<10% or >95% RH, including condensation) does not affect the reliability of HM1500LF characteristics.

Dedicated HM15XX products are available for extreme RH conditions (as HM1520 for low dewpoints). Consult MEAS-FRANCE for further information.



- **Modeled 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:

- $V_{out} = 25.68RH + 1079$
- $RH = 0.03892\ V_{out} - 42.017$

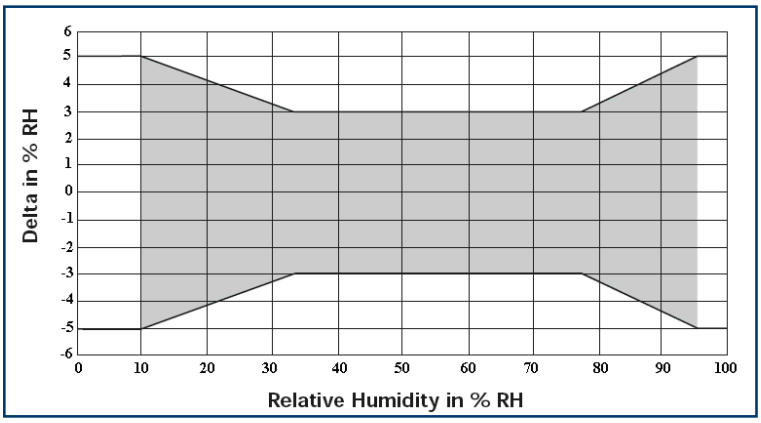
(With V_{out} in mV and RH in %)

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:

$$RH_{compensaed} = RH_{actualatT} + (T - 23) \times 0.05$$

(With T: Temperature in °C and RH: Relative Humidit y in %)

QUALIFICATION PROCESS

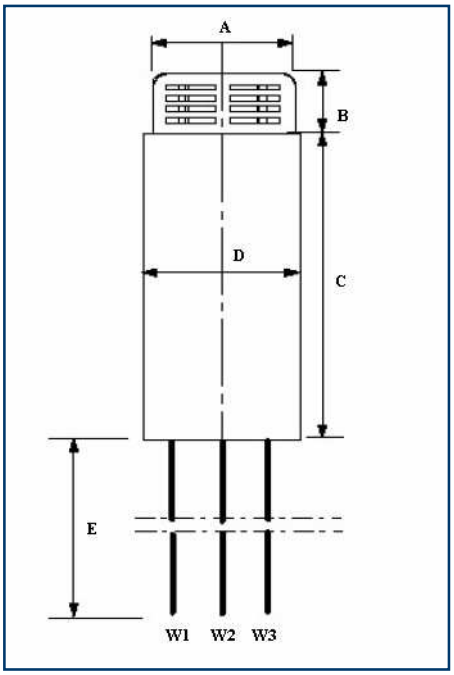
RESISTANCE TO PHYSICAL AND CHEMICAL STRESSES

- HM1500LF has passed through qualification processes of MEAS-FRANCE including vibration, shock, storage, high temperature and humidity, ESD.
- Additional tests under harsh chemical conditions demonstrate good operation in presence of salt atmosphere, SO2 (0.5%, H2S (0.5%), 03, NOx, NO, CO, CO2, Softener, Soap, Toluene, acids (H2SO4, HNO3, HCI), HMDS, Insecticide, Cigarette smoke, this is not an exhaustive list.
- HM1500LF is not light sensitive.

SPECIFIC PRECAUTIONS

- HM1500LF is protected against reversed polarity.
- If you wish to use HM1500LF in a chemical atmosphere not listed above, consult us.

PACKAGE OUTLINE



Dim	Min (mm)	Max (mm)
A	9.75	10.25
B	4.00	4.50
C	53	55
D	10.9	11.4
E*	200	250

** Specific lenght available on request*

Wire	Color	Function
W1	White	Ground
W2	Blue	Supply Voltage
W3	Yellow	Humidity Output Voltage

ORDERING INFORMATION

HPP805A031 (MULTIPLE PACKAGE QUANTITY OF 10 PIECES)

HM1500LF – HUMIDITY ANALOG VOLTAGE OUTPUT

Sample kit of HM1500LF is available through MEASUREMENT SPECIALTIES web site:
http://www.meas-spec.com/humidity-sensors.aspx

Customer Service contact details

Measurement Specialties, Inc - MEAS France
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CS 83 163
31027 Toulouse Cedex 3
FRANCE
Tél: +33 (0)5 820 822 02
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Sales: humidity.sales@meas-spec.com

Revision	Comments	Who	Date
C	Power supply ramp up time specification added	C.EISMANN	September 06
D	HPP Number updated, RoHS logo added	D. LE GALL	September 07
E	Standardized datasheet format and Current consumption lowering updated	D. LE GALL	April 08
F	New MEAS template, MEAS-France contact details updated	D. LE GALL-ZIRILLI	October 12

Mouser Electronics

Authorized Distributor

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TE Connectivity:

HM1500LF HPP805A031