HM1520LF

Relative Humidity Module

Specifications

- Tubular form for through wall mounting
- Product free from Lead, Cr(6+), Cd and Hg
- Calibrated, linear voltage for easy electronic interface
- Typical 1 to 1.6 Volt DC output for 0 to 20% RH at 5Vdc supply
- Ratiometric to voltage supply
- Patented solid polymer structure

Based on the rugged HS1101LF capacitive humidity sensor, HM1520LF is a dedicated humidity transducer designed for measurements at low humidity. Direct measurement of dew point or water concentration can be easily obtained in really cost effective conditions. Direct interface with a micro-controller is made possible with the module's linear voltage output

Features

- Full interchangeability
- Not affected by water immersion
- Controlled temperature dependency

Humidity Sensor Specific features
Not affected by long period at low humidity values
High resistance to chemical
Fast response time

Applications

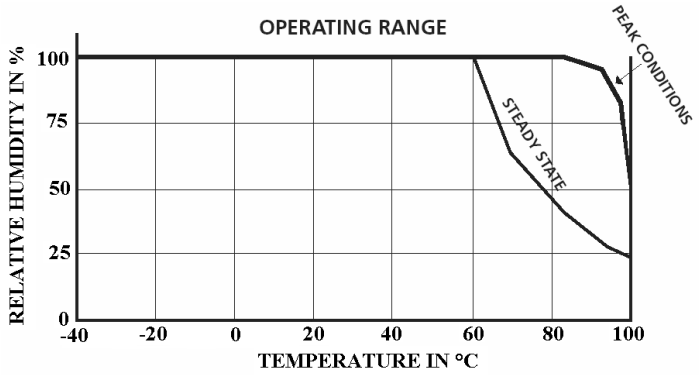
- Low Humidity
- Meteorology

Performance Specs

MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Storage Temperature	Tstg	-30 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

Peak conditions: less than 10% of the operating time.



ELECTRICAL CHARACTERISTICS

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

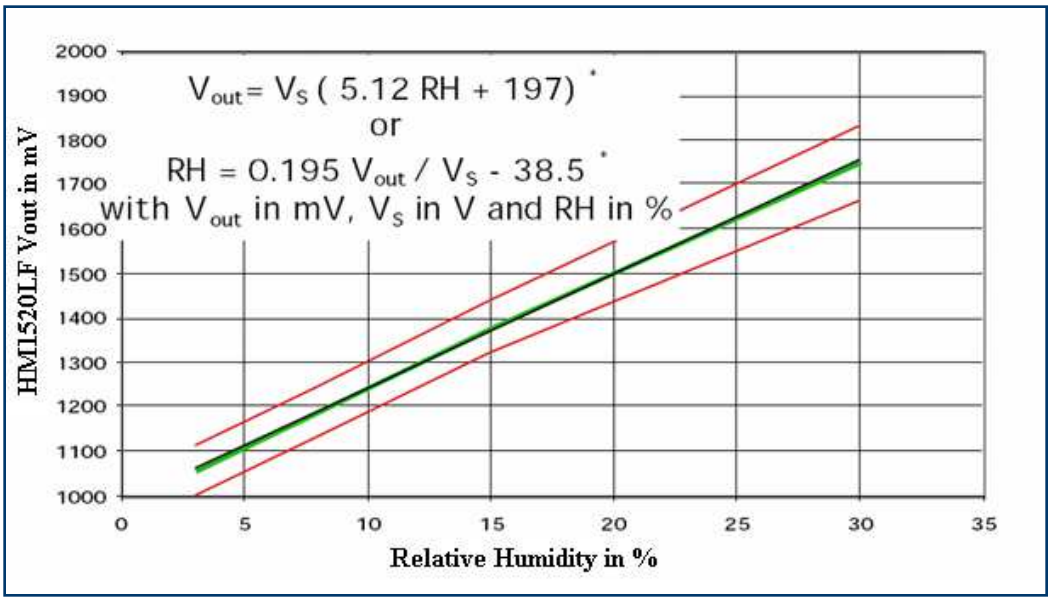
Humidity Characteristics	Symbol	Min	Typ	Max	Unit
Humidity Measuring Range / Ta -40 to 60°C	RH	0		100	%RH
Relative Humidity Accuracy (1 to 20% RH) at 23°C	RH		+/-2	+/-3	%RH
Relative Humidity Accuracy @55% RH at 23°C	RH		+/-5		%RH
Supply Voltage (regulated at 5Vdc*)	Vs	4.75	5	5.25	Vdc
Nominal Output @10%RH (Ta = 25°C)	Vout	1.17	1.24	1.31	V
Current Consumption	Ic		1.4	2	mA
Temperature Coefficient (10 to 50°C and 1 to 20% RH)	Tcc		- 0.05	-0.1	%RH/°C
Humidity Average Sensitivity from 5% to 10%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) 5% to 10%RH	τ			10	s
Warm Up Time (electronic)	tw		150		ms
Humidity Resolution			0.4		%RH
Long Term Stability			0.5		%RH/yr
Output Impedance	Z		70		Ω

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

Typical Performance Curves

HUMIDITY SENSOR

- **HM1520LF Preliminary Specification when used from 1 to 30% RH**



- Those equations can be used above 30% RH and allow to obtain an over all accuracy as described in page 4 of this document in all humidity measuring range.
- Temperature (in the range 0 to 50°C) does not affect HM1520LF measurement when used from 1% to 30% RH. No temperature compensation is required

- **Signal output from 1% to 20% RH at 23°C**

RH (%)	1	2	3	4	5	6	7	8	9	10
Vout (mV)	1013	1038	1064	1089	1115	1141	1166	1192	1217	1243
RH (%)	11	12	13	14	15	16	17	18	19	20
Vout (mV)	1269	1294	1320	1346	1371	1397	1422	1448	1474	1499

With Vs = 5.0 Volts DC
Calibration data are **traceable to NIST** standards through CETIAT laboratory.

IMPORTANT NOTICE : HM1520LF is based on HS1101LF capacitive sensor and thus is fully useable on a large range of relative humidity (1% to 99% RH). In that range, HM1520LF presents a typical accuracy of +/- 5% RH at 55% RH.)

However HM1520LF is a dedicated module for humidity measurements at low Relative Humidity levels.

Thus, HM1520LF is also well adapted to measure water concentrations (ppm) or low dew points when associated with an ambient temperature probe.

HM1520LF features an optimized accuracy for **water concentration below 6000 ppm water or 0°C dew point at 23°C** (equivalent to 20% RH).

- **Typical Output of HM1520LF when measuring water concentration at ambient temperature of 23°C**

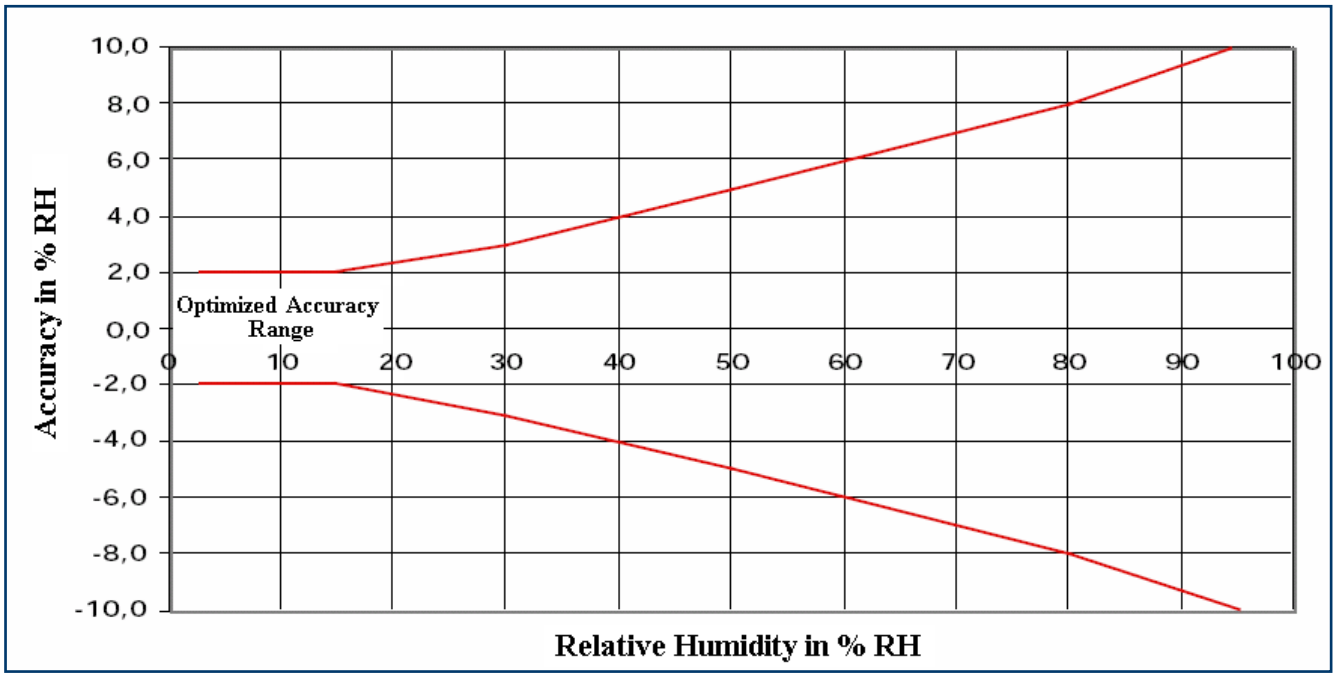
ppm	**275**	**550**	**825**	**1100**	**1375**	**1650**	**1925**	**2200**	**2470**	**2750**
Vout (mV)	1013	1038	1064	1089	1115	1141	1166	1192	1217	1243
ppm	**3025**	**3300**	**3570**	**3850**	**4120**	**4395**	**4670**	**4945**	**5220**	**5495**
Vout (mV)	1269	1294	1320	1346	1371	1397	1422	1448	1474	1499

$$ppm_{water} = 10.75\ V_{out} - 10615 \text{ with } V_{out} \text{ in mV}$$

- **Typical Output of HM1520LF when measuring dew point at ambient temperature of 23°C**

DP (°C)	**-36**	**-29**	**-24**	**-21**	**-18.5**	**-16**	**-14.5**	**-13**	**-11.5**	**-10**
Vout (mV)	1013	1038	1064	1089	1115	1141	1166	1192	1217	1243
DP (°C)	**-9**	**-7.8**	**-6.8**	**-5.8**	**-4.9**	**-4.1**	**-3.2**	**-2.5**	**-1.6**	**-1.1**
Vout (mV)	1269	1294	1320	1346	1371	1397	1422	1448	1474	1499

- **Accuracy of HM1520LF when used from 1% to 95% RH**



Qualification Process

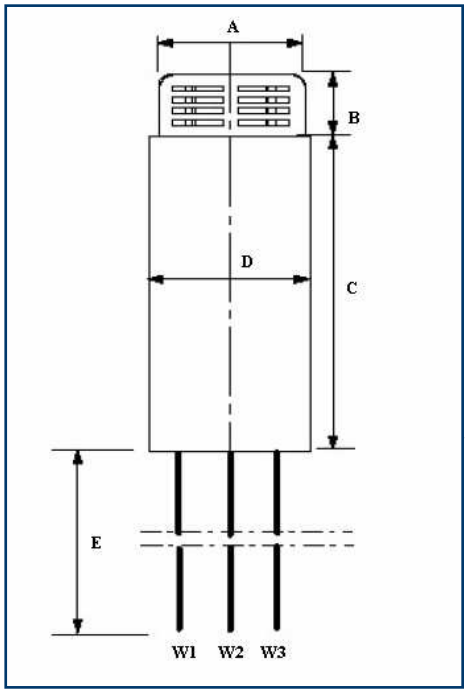
RESISTANCE TO PHYSICAL AND CHEMICAL STRESSES

- HM1520LF 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.
- HM1520LF is not light sensitive.

SPECIFIC PRECAUTIONS

- HM1520LF is protected against reversed polarity.
- If you wish to use HM1520LF 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
	200	250

** Specific lenght available on request*

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

Ordering Information

HPP805C031 (MULTIPLE PACKAGE QUANTITY OF 10 PIECES)
HM1520LF – HUMIDITY ANALOG VOLTAGE OUTPUT MODULE

神州融安科技（北京）有限公司

电话：010-62127688、82057633

地址：北京市海淀区花园路2号牡丹科技楼B座三层B308室

网址：www.ronganchina.cn

NORTH AMERICA
Measurement Specialties, Inc.,
a TE Connectivity Company
Phone: +1-800-522-6752
customercare.hmpt@te.com

EUROPE
MEAS France(Europe)
a TE Connectivity Company
Phone: +31 73 624 6999
customercare.dtmd@te.com

ASIA
Measurement Specialties (China), Ltd.,
a TE Connectivity Company
Phone: +86-400-820-6015
customercare.shzn@te.com

TE.com/sensorsolutions