



HUMIDITY AND TEMPERATURE 4-20 mA Transmitters

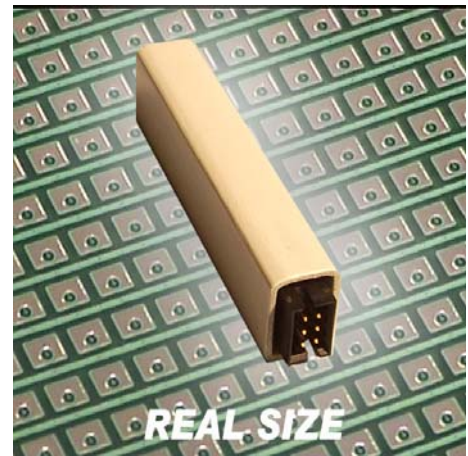
H-TUTA.32

This miniature module is intended to be associated to a probe of humidity and temperature measurement F-TUCN.33P. It provides a stabilized power supply for the micro-system, The channel humidity, performs the signals acquisition of measurement in frequency and delivers a **DC linear current proportional to the relative humidity level according to the 4-20 mA two wires system.** The channel temperature, performs the signal acquisition of measurement in variable resistor and deliver a **DC linear current proportional to the temperature level according to the 4-20 mA two wires system.** **The two 4-20 mA channels are galvanic isolated.**

This system is characterized by an **operating voltage and a measurement current carried by the same two wires** without decoding. The measurement current which is mixed with the consumption current, is **regourously independent** from the voltage supply in a proportion of 600 % and the charge resistance could reach 1500 Ω.

This internationally patented technology is a major step forward in the field of sensor-transmitters with long-term stability and reduction of mass production cost.

4-20 mA two wires output
Linears output humidity and temperature
High accuracy - High reliability
Moulded plug-in module
Operating from 0 to 100 % RH, -40 to +100°C
Total interchangeability without recalibration
Insensitive to both voltage supply and load resistor
Best quality-price ratio on the world market



MAIN CHARACTERISTICS

Associated to the probe F-TUCN.33P

- | | |
|---|--|
| ➤ Qualified measurement range: | 2 % RH to 98 % RH, -20° C to +80° C |
| ➤ Time constant humidity: | 0,25 sec. to 20 sec. depending on model R or L |
| ➤ Operating temperature: | -40° C to +100° C |
| ➤ Accuracy according to reference conditions: | ± 3 % RH, ± 1° C (option 2% RH, 0.25°C) |
| ➤ Nominal internal power consumption: | 0,024 W to 0,72 W depending on current & voltage |
| ➤ Humidity desaturation time: | 2 sec. to 100 sec. following Lx (100 % RH 150 h) |
| ➤ Output signal: | 4-20 mA DC current, 2 channels |
| ➤ Rated power supply voltage: | 7.5 VDC to 40 VDC without metrologic effect |
| ➤ Humidity basic transfer function: | $I \text{ (mA)} = 4,0 + 0,16 \% \text{ RH}$ |
| ➤ Temperature transfer function: | $I \text{ (mA)} = 7,2 + 0,16.Ta \text{ (°C)}$ |
| ➤ Standard calibration (I ₅₅ , T ₂₅) : | 12,8 mA at 55 % RH and at 0° C |
| ➤ Thermal sensitivity RH: | ± 0,05 % RH / ° C, 0,004° C / ° C |
| ➤ Parallelepipedic dimensions: | 60 mm (l) x 13 mm (L) x 10 mm (p) |

ORIGINAL TECHNOLOGY UPSICAP – MSS BI-FACE

UPSI product range are based on two fundamental concepts *UPSICAP* and *MSS Bi-Face* elaborated and developed by the *Société d'applications électroniques pour la Physique, la Science et l'Industrie* (international patent <http://www.patentstorm.us/patents/6450026-claims.html>)

The MSS Bi-Face concept incorporates on the same substrate both, the humidity sensor on the main face and electronic device, including connections, on the opposite side.

The humidity cell is not added on the substrate but carried out directly *in situ* .

Accuracy, stability and reliability are improved, connecting the sensor to the acquisition electronic circuit with continuum solid vias excluding link wires or printed circuit.

The surface electrode in contact with water vapor is connected to 0V (ground) provides shielding against surrounding electrical field and its thickness provide high robustness atmospheric filter.

The absence of electrical connections on the sensitive face does away with a barrier irregularity reducing the airborne dust on this side and enhancing reliability in the event mechanical action affecting the cell.

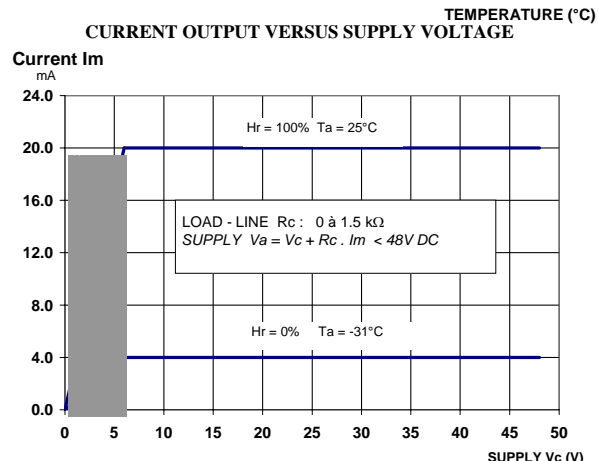
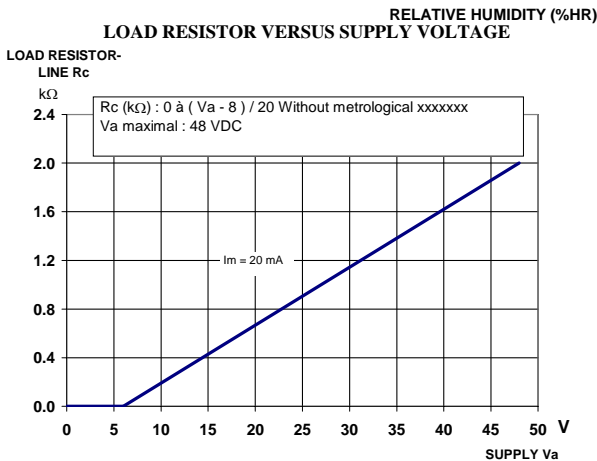
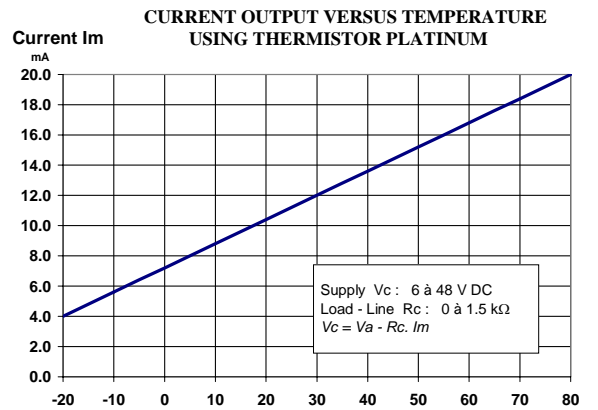
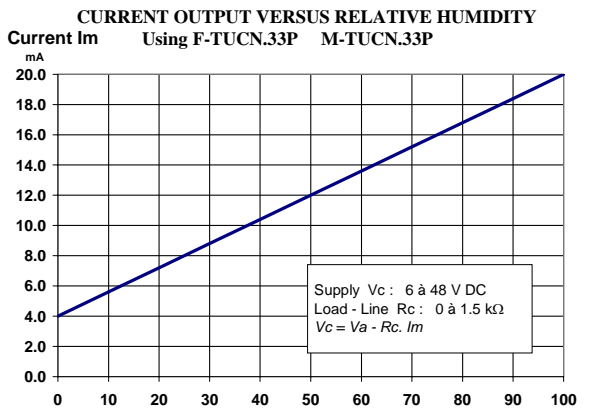
For harsh environment, a complementary filter could be placed on the sensing side.

The additional function (transmitter) component quantity is divided by 2 using some multifunction device increasing the reliability and decreasing area and cost (original electronic concept).

This technology allow to supply an analogic or digital sensor transmitter with 100 μW - 20 μA.

The operating range until 100% RH is insured by a specific treatment (substrate and components impregnation).

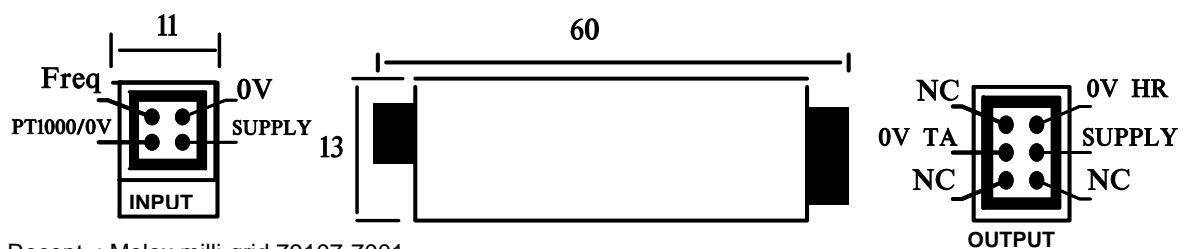
TRANSFER FONCTIONS



ELECTRICAL AND MEASURING SPECIFICATIONS

Measured or influencing values	Definition associated to probe F-TUCN.33P	Values			Unit
		Min.	Nom.	Max.	
Relative humidity RH	RH measuring range	2	→	98	% RH
	RH operating range	0	→	100	% RH
	Hysteresis		< 1.5		% RH
	Accuracy according to references conditions		3		% RH
	Linearity error (2 % RH to 98 % RH)		1.5		% RH
	Time constant Fast version R	0.20 ↑	0.30	0.40 ↓	sec.
	Version L1 filter	30 ↑	40	50 ↓	sec.
	Recovery time (100% RH 150 hours)	2 (R)		100 (L ₁)	sec.
	Absolute humidity Specified metrology		0.12		Kg/Kg
Maximum Metrology outside tolerance		0.35		Kg/Kg	
	Degraded metrology		0.5		Kg/Kg
<i>Output signal</i> mA / %RH	DC current measurement and supply Linearly variable as a function of RH	4.0	→	20.0	mA
<i>Transfer</i>	I (mA) = 4.0 + 0.16 . % RH				
	Standard calibration 12 % RH	5.60	5.92	6.24	mA
	55 % RH	12.5	12.8	13.1	mA
	97.5 % RH	19.0	19.6	20.2	mA
	Sensitivity (33 % RH à 76 % RH)		0.16		mA/%RH
Ambient Ta temperature	Range of measurement Ta	- 20	0	+ 80	° C
	Precision in reference conditions		0,3		° C
	Linearity error (-30°C à +30°C)		0,15		° C
<i>Output signal</i> mA / °C	Direct current measurement – supply Linearly proportionnal versus AT	4,0	→	20	mA
<i>Transfert</i>	I (mA) = 12,8 ± 0,28.Ta (° C)				
	Standard calibration à 0° C	12,72	12,8	12,88	mA
	Sensitivity		0,16		mA / ° C
<i>Electrical power supply</i>	Supply voltage Vcc	7.5	→	40	V
	Measurement and consumption current Icc	4.0	→	20.0	mA
<i>Stability</i>	Instantaneous modulation (noise)	0.005	0.01	0.05	% RH
	Sensitivity to power supply voltage (Vcc)		0.005		%RH/V
	Sensitivity to line resistance – charge Rc		0.1		%RH/KΩ
	Thermal sensitivity	0.03	0,04	0.05	%RH/°C
Temperature range	Long term storage	- 50	+ 25	+ 85	°C
	Specified operating range	- 30	+ 25	+ 80	°C

MECHANICAL SPECIFICATIONS - ELECTRICAL CONNECTION



Recept. : Molex milli-grid 79107-7001

Recept. : Molex milli-grid 79107-7002

APPLICATIONS

UNITE DE PRODUCTION DE SYSTEMES INDUSTRIELS

S.A.R.L au capital de 660 000 € RCS Créteil B 433 547 643 Siret 433 547 643 00018 Code NAF 321 C

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