HUM AF 2 7 3 0--Gas flow, relative humidity and temperature--integrated module transducer

- The small, simple HUMAF2730 all-in-one module is based on MEMS technology (microelectromechanical systems)
- Conveniently connected to the catheter
- Gas flow measurement range: 0-300 SLPM (1)
- Good interchangeability within +/-5 SLPM, + / -3% RH, + / -0.3℃
- Gas flow accuracy does not drift with temperature
- Digital output interface (I ^{2} C), high resolution

Product Introduction

The HUMAF2730 is a professional, fully-calibrated plug-and-play module integrating gas flow, humidity, and temperature sensors with unique design. Specifically engineered for OEM applications requiring reliable and precise measurements in medical and HVAC fields, it features universal digital I ^{2} C communication protocols for direct connection to main MCUs. Its simplified four-pin connector delivers an optimal cost-performance ratio while maintaining technical sophistication.

characteristic

- The product is lead free, chromium (6 $^+$), cadmium and mercury free, and complies with RoHS regulations
- Can accurately measure gas flow, temperature and humidity
- High reliability and long-term

stability maximum rated value

application area

- 医疗工业
- 家用电器
- HVAC

Rated specifications	symbol	numeric value	unit
Storage temperature	Tstg	-40--+85	℃
Power supply voltage (peak) (2)	Vcc	3.7	Vdc
Pressure measurement range	P	101.3+/-50	kPa
Humidity measurement range (3)	RH	5---99	%RH
Temperature measurement range	Ta	-30---+85	℃
maximum surge current	Iavg	100	mA
@3.3Vdc maximum power consumption	Pd	165	mW

(1) SLPM: standard elevation per minute (gas).

(2) Peak condition: less than 10% of working time

Condensation (3) should be avoided

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Scope of Measurement Specificity

@Vcc=3.3Vdc T=20℃, P=101.3kPa, RH=55% (standard conditions for testing)

specifications	symbol	least value	representative value	crest value	unit
Gas flow measurement range	AF	0		300	SLPM
Flow accuracy [1]			+/-(0.9FR +0.2FS)		%
Flow resolution			+/-0.1		SLPM
Read the response time of the flow value			5		ms
Humidity measurement range	RH	0		100	%RH
Relative humidity accuracy(10% --95%RH) [2]			+/-3	+/-5	%RH
Relative humidity resolution			+/-0.1		%RH
Temperature measurement range	T_a	-30		85	℃
Temperature accuracy (-10--+40℃)			+/-0.3	+/-0.5	℃
temperature resolution			+/-0.1		℃
preheating time	t_w		350		ms
Flow time constant(63% of the measured signal) [3]	τ		1		s
Humidity time constant(63% of the measured signal) [4]	τ		3		s
Temperature time constant (63% of the measured signal)	τ		10		s

1 Accuracy =+/- (percentage of flow FR + percentage of full scale FS)

2 Gas flow rate greater than 0.1SLPM

3 Gas flow from 0—0.1SLPM is effective

4 Relative humidity from 33---76%RH

electrical character

specifications	symbol	least value	representative value	crest value	unit
Power supply voltage (1)	V_{dd}	3	3.3	3.7	V_{dc}
supply current	I_{avg}		35	50	mA
SCL frequency	F			100	kHz

(1) For the root voltage requirement of 5.5V $_{DC}$, please consult

Digital Signaling Transmission Specifications

HUMAF is a slave module that transmits data signals in accordance with the I^2C communication protocol standard. The data format can be modified according to customer requirements.

- HUMAF from module address

Each module (controlled machine) is assigned a unique address: **0x55**

From the module (controlled machine) address is composed of 7 address bits and one read/write flag (R/W), its format is: **0xAB(** read permission **)** and **0xAA(** write permission **)**

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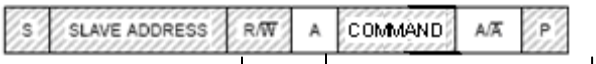
- protocol

order	code
obligate	0x0
Gas flow reading	0x2A
Temperature readings	0x34
Humidity read	0x47



data transfer

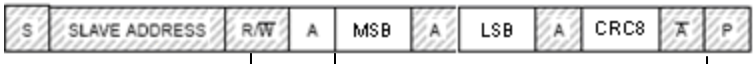
"0" (write) (n Bytes + Response)

Master machine to controlled machine A = Answer bit (low SDA)

The mouth is connected to the main control machine A= Non-response bit (high SDA)

S= initial condition

P= stop condition



data transfer

a Slight Pause in Reading (n Bytes + Response)

$$CRC8 = \left(\overline{dataMSB \ XOR \ dataLSB}\right) - 1$$

Data Transfer

gas-flow rate	least value	representative value	crest value
Limiting value (SLPM)	0		15.00
Limits (data)	0x0000		0x0BB8
Resolution (SLPM)		0.01	
Resolution (data)		1	
Refresh period (ms)		20	
temperature	**least value**	**representative value**	**crest value**
extreme (℃)	-30.0		+85.0
Limits (data)	0xFED4		0x0352
resolution ratio (℃)		0.1	
Resolution (data)		1	
Refresh period (ms)		100	
humidity	**least value**	**representative value**	**crest value**
Limit value (%) RH)	0.0		+100.0
Limits (data)	0x0000		0x03E8
resolution ratio (℃)		0.1	
Resolution (%RH)		1	
Refresh period (ms)		100	

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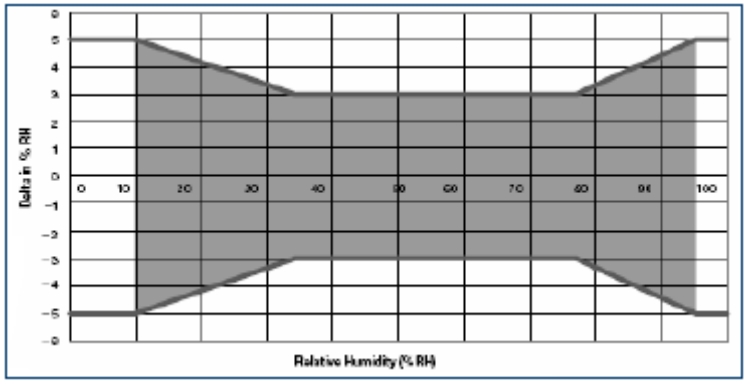
Error in Humidity at 2, 3℃

The sensor has the highest measurement accuracy at 10-95%RH,

Exceeding this range (<10% or> 95% RH, including condensation) will not affect the reliability of the HUMAF2730 sensor.

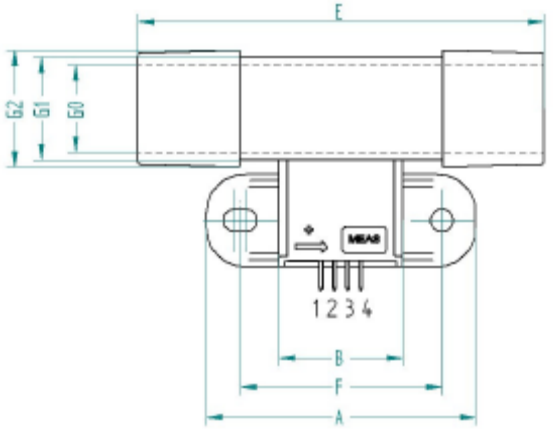


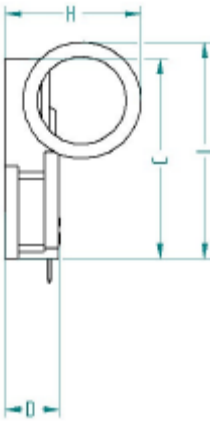
Component Exterior Shape and Dimensions

Foot position functional distribution

foot position	function
1	SCL-Data clock
2	SDA— data address
3	the earth
4	source

HUMAF2730 external dimensions





Dim	Typ (mm)
A	51.7
B	23.7
C	38.8
D	10.4
E	77.9
F	38.7
G0	17
G1	20
G2	22.6
H	26
I	42

- 装备接口为 ISO5356 标准
- 对于板对板装配，建议用波峰焊或铬铁焊
- 引脚间距：2.54 mm

Reliability Tests

Resist the effects of nature and chemicals

- HUMAF2730 contains an anti-static protection circuit (ESD) up to ±15kV, indirect electrostatic discharge.
- HUMAF2730 anti-EMC interference.
- HUMAF2730 has input polarity protection

Additional tests: The sensor can work normally under harsh chemical conditions, such as salt spray, SO2 (0.5%), H2S (0.5%), O3, NOx, NO, CO, CO2, softener, soap, toluene, acid (H2SO4, HNO3, HCl), HMDS, insecticide, cigarette smoke, and some gases cannot be listed one by one

- HUMAF2730 is not sensitive to light

Credit for Purchase

HUMAF2730 : HPP830C001

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