

HUM AF 2 7 1 0--Gas flow, relative humidity and temperature--integrated module transducer



- The small, simple HUMAF2710 all-in-one module is based on MEMS technology (microelectromechanical systems)
- Conveniently connected to the catheter
- Gas flow measurement range: 0-10 SLPM ⁽¹⁾
- Good interchangeability within +/-0.2 SLPM, +/- 3% RH, +/- 0.3°C
- Gas flow accuracy does not drift with temperature
- Digital output interface (I²C), high resolution

Product Introduction

The HUMAF2710 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 I²C 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

application area

- 医疗工业
- 家用电器
- HVAC

Performance Parameter

maximum rating

Rated specifications	symbol	numeric value	unit
Storage temperature	T _{stg}	-40--+85	°C
Power supply voltage (peak) ⁽²⁾	V _{CC}	3.7	V _{dC}
Pressure measurement range	P	101.3+/-50	kPa
Humidity measurement range ⁽³⁾	RH	5---99	%RH
Temperature measurement range	T _a	-30---+85	°C
maximum surge current	I _{avg}	100	mA
@3.3V _{dC} maximum power consumption	P _d	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

@V_{cc}=3.3VdcT=20°C, P=101.3kPa, RH=55% (standard conditions for testing)

specifications	symbol	least value	representative value	crest value	unit
Gas flow measurement range ¹	AF	0		10	SLPM
Flow accuracy ²			+/- (1.3FR + 0.4FS)		%
Flow resolution			+/-0.01		SLPM
Read the response time of the flow value			5		ms
Humidity measurement range	RH	0		100	%RH
Relative humidity accuracy (10% --95%RH) ³			+/-3	+/-5	%RH
Relative humidity resolution			+/-0.1		%RH
Temperature measurement range	T _a	-30		85	°C
Temperature accuracy (-10--+40°C)			+/-0.3	+/-0.5	°C
temperature resolution			+/-0.1		°C
preheating time	t _w		350		ms
Flow time constant(63% of the measured signal) ⁴	τ		1		s
Humidity time constant(63% of the measured signal) ⁵	τ		3		s
Temperature time constant (63% of the measured signal)	τ		10		s

For ¹ gas flow range expansion to 30SLPM, please consult

² Accuracy =+/- (percentage of flow FR+ percentage of full scale FS)

³ Gas flow rate greater than 0.1SLPM

⁴ Gas flow from 0—0.1SLPM is effective

⁵ Relative humidity from 33---76%RH

electrical character

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

(a) For the power supply voltage of 5.5V_{DC}, please consult

Digital Signaling Transmission Specifications

HUMAF is a slave module that transmits data signals in accordance with the I²C 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**

The address of the module (controlled machine) consists 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



"0" (write) (n bytes + response)

Master machine to controlled machine A = Response (low SDA)

The mouth is controlled by the main control machine A = Non-response (SDA high level)

S= initial condition

P= stop condition



data transfer

a Slight Pause in Reading (n Bytes + Response)

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

Data Transfer

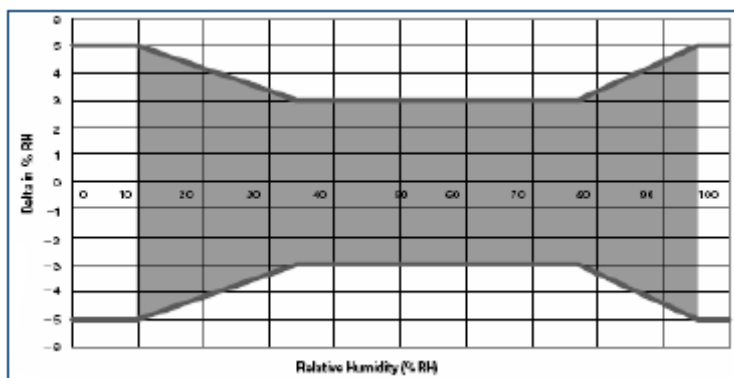
gas-flow rate	least value	representative value	crest value
Limiting value (SLPM)	0		15.00
Limits (data)	0x0000		0x05DC
Resolution (SLPM)		0.01	
Resolution (data)		1	
Refresh period (ms)		20	
temperature	least value	representative value	crest value
extreme (°C)	-30.0		+85.0
Limits (data)	0xFED4		0x0352
resolution ratio (°C)		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 (°C)		0.1	
Resolution (%RH)		1	
Refresh period (ms)		100	

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Error in Humidity at 2, 3°C

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 HUMAF2710 sensor.

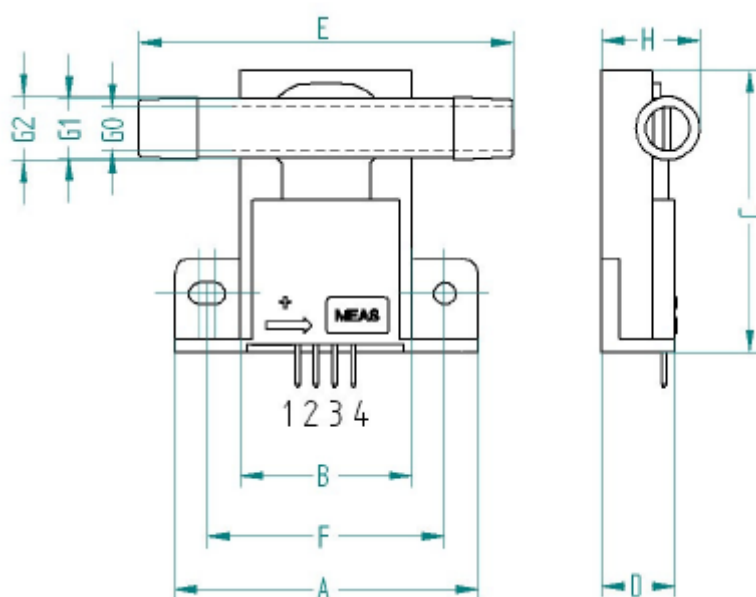


Component Exterior Shape and Dimensions

Foot position functional distribution

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

HUMAF2710 external dimensions



Dim	Typ (mm)
A	41.3
B	23.3
C	38.4
D	10
E	50.9
F	32.3
G0	6
G1	8
G2	8.66
H	13.33

- 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

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Reliability Tests

Resist the effects of nature and chemicals

- HUMAF2710 contains an anti-static protection circuit, up to $\pm 15\text{kV}$, indirect electrostatic discharge.
- HUMAF2710 anti-EMC interference.
- HUMAF2710 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, NO_x, NO, CO, CO₂, softener, soap, toluene, acid (H₂SO₄, HNO₃, HCl), HMDS, insecticide, cigarette smoke, and some gases cannot be listed one by one

- HUMAF2710 is not sensitive to light

Credit for Purchase

HUMAF2710 : HPP830B001

深圳市杰晟兴电子有限公司 JM Components Limited

地址：深圳市福田区中航路7号鼎诚国际大厦南座2007室

手机：13662266995 马少良 电话：0755-83951311

官网：cn-sensor.com

邮编：518031

传真：0755-83952401

电邮：jackson@jmcomponents.com