

# ULTRASONIC GAS MODULE US-100-5V



## ULTRASONIC GAS MODULE US-100-5V

US-100-5V is gas analyzer with ultrasonic sensor for detecting.

This gas module output analog voltage by measuring sound-speed and temperature of mixed two sorts of gases.

### STRONG POINT

- ◎ LONG LIFE
- ◎ EASY TO INSTALLATION
- ◎ ONLY 10 SECOND FOR WARM-UP
- ◎ SAVE ENERGY

### SPECIFICATIONS

WARM-UP TIME	About 10 sec.
SAMPLE TEMP.	Normal temperature (40°Cmax)
SAMPLE PRESSURE	0~+5kPa
FLOW RATE	0.5~5.0L/min
POWER SUPPLY	Less than $\pm 0.1V$ of DC +5.0V
AMBIENT TEMP.	5~45°C
PIPING	IN OUT : tube of $\phi 5 \sim 6.5$ mm in inside diameter
ANALOG OUTPUT	D.C. 0-1V
LINEARITY	Less than $\pm 2\%$ of full scale
REPEATABILITY	Less than $\pm 2\%$ of full scale
RESPONSE TIME	90% reading is within 10sec.

### PERFORMANCE

	MEASUREMENT RANGE	MEASUREMENT ACCURACY
H <sub>2</sub> /N <sub>2</sub>	0 ~ 50%	0.1%
He/N <sub>2</sub> 、He/Air	0 ~ 50%	0.1%
O <sub>2</sub> /N <sub>2</sub>	0 ~ 100%	0.7%
Xe/Ar、Kr/N <sub>2</sub> 、CF <sub>4</sub> /N <sub>2</sub>	0 ~ 100%	0.05%
Xe/N <sub>2</sub> 、SF <sub>6</sub> /N <sub>2</sub>	0 ~ 100%	0.03%

※As is often the case with changing this specification for improvement without permission.

It is theoretically possible for US-100-5V to analyze some mixed two sorts of gases.

## PRINCIPLE & DIMENSION

### PRINCIPLE

Sound speed what carries in the gases depends on molecular weight of gas.  
 ULTRASONIC SENSOR calculates average molecular weight that is changed by concentration and temperature of mixed gas, and indicates concentration of mixed two sorts of gases.

Sound speed goes as follows.

$$V = \sqrt{\gamma \times R \times T \div M}$$

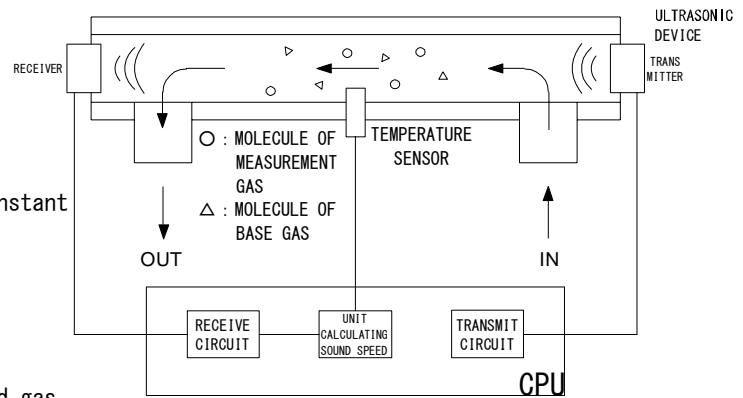
where

$\gamma$  is the ratio of heat capacity at constant volume to heat capacity at constant pressure

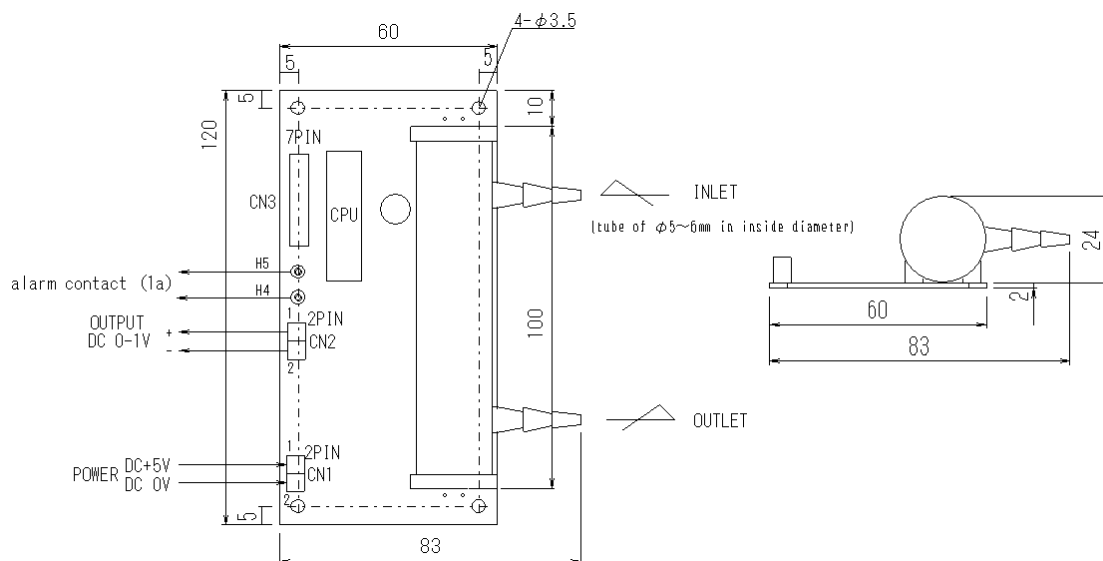
R is constant of gas (8.314)

T is Absolute temperature of gas

M is average molecular weight of mixed gas



### DIMENSION



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