PRODUCT INFORMATION
Sensor for Air quality control

- for the detection of Formaldehyde
  Toluene, Organic Solvent
- Semi conductor type,

General
It is applied detection of VOCs gases (toluene, formaldehyde, benzene, etc.)

Application: Ventilator, Air cleaner, Hood.

Operation range
- Working temperature: -10℃ ~ 50℃
- Working humidity: below saturation point
- Storage temperature: -20℃ ~ 80℃

Products characteristics

<table>
<thead>
<tr>
<th>Package</th>
<th>Characteristics</th>
<th>Output data</th>
<th>Warm-up time, PH</th>
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<tr>
<td>MS1100</td>
<td>Wide detection of VOCs gases</td>
<td>Analogue (1 ~ 5Volt)</td>
<td>5min 350ms</td>
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<tr>
<td></td>
<td>Application: Air cleaner, Hood</td>
<td>Basic circuit</td>
<td></td>
</tr>
<tr>
<td>MS1100 - P1XX</td>
<td>Standard, Op-amp amplifying</td>
<td>Analogue (0.5 ~ 5Volt)</td>
<td>5min 360ms</td>
</tr>
<tr>
<td></td>
<td>Relay output: fixed concentration</td>
<td>Relay: Hi(4V), Low(0V)</td>
<td></td>
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</table>

1. Sensitivity Characteristic Slope ($\beta = \frac{R_{s,\text{gas}}}{R_{s,\text{air}}}$)

VOCs Sensor

2. Basic Measuring Circuit Stability

![Basic Measuring Circuit](image)

![Long Term Stability](image)
### Product Information

#### Sensor for Air quality control

**Update:** 2010.05.15

**Å**
- Digital output ppm (Open collect)
- Power consumption: 450㎽
- Inrush current: Less than 215mA

**MS1101-PX**
- Power consumption: 380㎽
- Inrush current: Less than 195mA

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### 3 Module

#### a. Characteristics

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<td>5±0.1Volt</td>
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<td>Power consumption</td>
<td>380㎽</td>
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<tr>
<td>Inrush current</td>
<td>Less than 195mA</td>
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<tr>
<td>Analogue output</td>
<td>(refer to 3.1, f.)</td>
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<tr>
<td>Relay output</td>
<td>(Special ppm)</td>
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<td>Digital output ppm</td>
<td>(Open collect)</td>
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#### Circuit Voltage

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<th>Circuit Voltage</th>
<th>Vc</th>
<th>PH</th>
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<tr>
<td>Module input Voltage</td>
<td>5±0.1Volt</td>
<td>Power consumption: 380㎽</td>
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<tr>
<td>Power consumption</td>
<td>380㎽</td>
<td>Inrush current: Less than 195mA</td>
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#### Characteristics of Output data

- Analogue output
- Relay output

#### Guarantee

- 3 years over
- Calibration interval 1 years recommended

#### Operating environment

- Temp. : -10 ~ 50°C, Humidity : 5 ~ 90%RH, Non-condensing
- Storage → Temp. : -20 ~ 70°C, Humidity : 0 ~ 90%RH

#### Reaction time (T90)

- Less than 10sec
- Less than 180sec

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### b. Product code

**MS1101-P1XX**

- Max. Output range 1ppm : Hi (4.0~4.1volt) output at 1ppm (Toluene)

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### c. Relay Output

**MS1101-P3XX**
**Formulation of Formaldehyde**
\[
\log(\text{ppm}) = (-1.095) + 0.627 \times (Vout)
\]
\[
\log(\text{ppm}) = (-2.631) + 1.528 \times (Vout) + (-0.125) \times (Vout)^2
\]

**Formulation of Toluene**
\[
\log(\text{ppm}) = (-3.478) + 1.104 \times (Vout)
\]
\[
\log(\text{ppm}) = (-7.071) + 2.852 \times (Vout) + (-0.210) \times (Vout)^2
\]
4. Structure and Dimensions

4.1 Package

4.2 Pack module

a. Data output

- Vcc : 5.0volt
- GND
- Data(Vout, analogue signal)
- Relay

b. Relay Output

Max. output range H2 340ppm : Hi(4.0~4.1volt) output at 70ppm(H2)
Hi(4.0~4.1volt) output at 480ppm(Smoke)