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Nemoto Sensor Engineering Company Ltd

Nemoto (Europe) B.V.
Burgemeester Haspelslaan 53
1181NB Amstelveen
The Netherlands
Tel +31 20 670 3858
Fax +31 20 670 2709
www.nemoto.eu

Technical information

Gas sensing unit NSU-131AF

(For general combustible gases)

4-10-9, Takaido-higashi, Suginami-ku, Tokyo
Nemoto & Co., Ltd. Sensor sales group
TEL. 03-3333-7341
FAX. 03-3333-7344

Combustible gas detection unit NSU-131AF

The NSU-131AF is a simple flammable gas detection module consisting of a Nemoto catalytic type gas sensor type NAP-51A, fitted to a Wheatstone Bridge type measuring circuit with a locked zero trim potentiometer housed within a simple plastic enclosure. When supplied with the recommended drive voltage supply, an analogue signal is delivered which is directly proportional to the concentration of methane and hydrogen at the sensor. To facilitate error detection, the pre-calibrated zero offset level may be specified by the customer. In normal use it is anticipated that following commissioning in the field, subsequent calibrations will not be necessary.

Features are as follows.

- Small size, light and cheap.
- Detects flammability directly.
- Low dependence on installation environment, and easy handling.
- Excellent stability and reliability, long life.
- Quick response.

1. Ratings

・Supply voltage DC2.50±0.1V

・Current consumption 160－180mA (when 2.50V is applied)

・Ambient temperature and humidity in operation

Temperature	-20－+80℃
Humidity	less than 95%RH

・Ambient temperature and humidity in storage

Temperature	-20－+70℃
Humidity	less than 95%RH (no dew condensation)

2. Characteristics

・Recommended stabilization time 1 min.

・Response time less than 30sec. (at 90% response)

・Recommended calibration 10±1%LEL (when 2.50V is applied)

(methane 4,500-5,500ppm, hydrogen3,600-4,400ppm)

・Adjustable calibration level　　5－25%LEL
・Zero offset in clean air　　dependence on calibration

3. Detection gases

4.

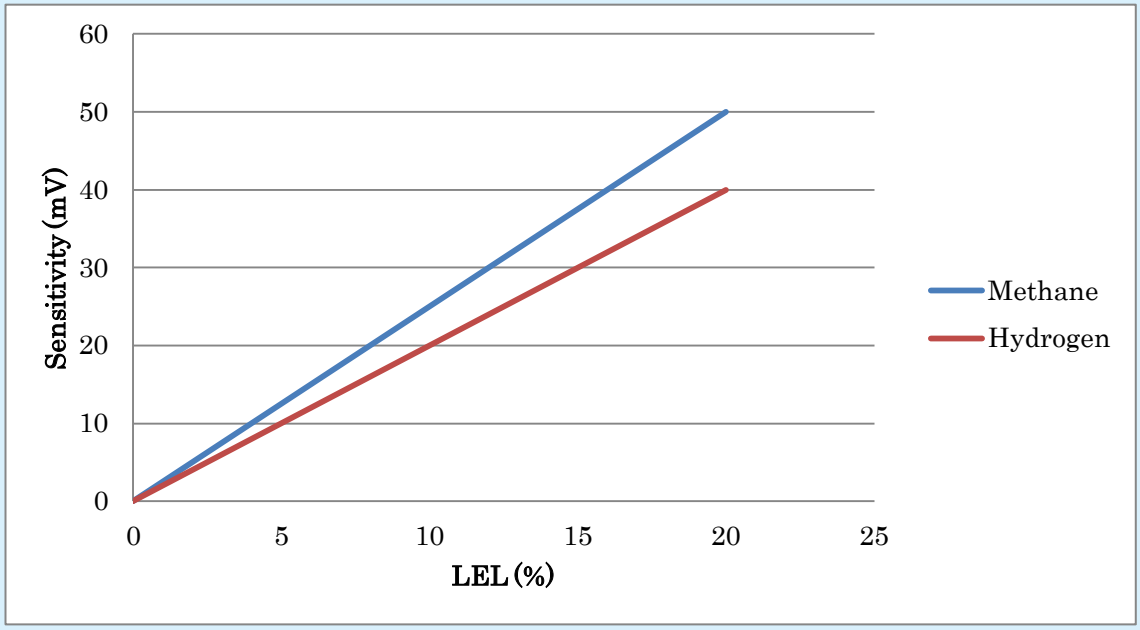
Gases		Recommended calibration level
1	Natural gas (methane)	10－30%LEL
2	Hydrogen	10－30%LEL

Only methane and hydrogen are generally detectable target gases, however please note that it is not recommended that it is calibrated less than 5%LEL and more than 50%LEL because of low detection accuracy. Gas sensitivity on methane and hydrogen are shown as follows.

5. Gas sensitivity

The average gas sensitivity to mainly detectable gases are below described as a calibration reference.

Gases		Standard gas sensitivity
1	Methane	20－30mV/5,000ppm
2	Hydrogen	16－24mV/4,000ppm

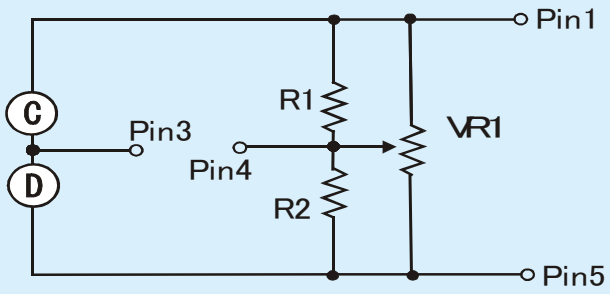


6. Terminals

No.1	+2.50V
2	Unused
3	Output signal (+)
4	Output signal (-)
5	GND.

NOTE:

Since terminal 5 (GND.) and Terminal 4 (output signal (-) are independent of each other should not be electrically connected by the external circuit.



7. Handling procedure

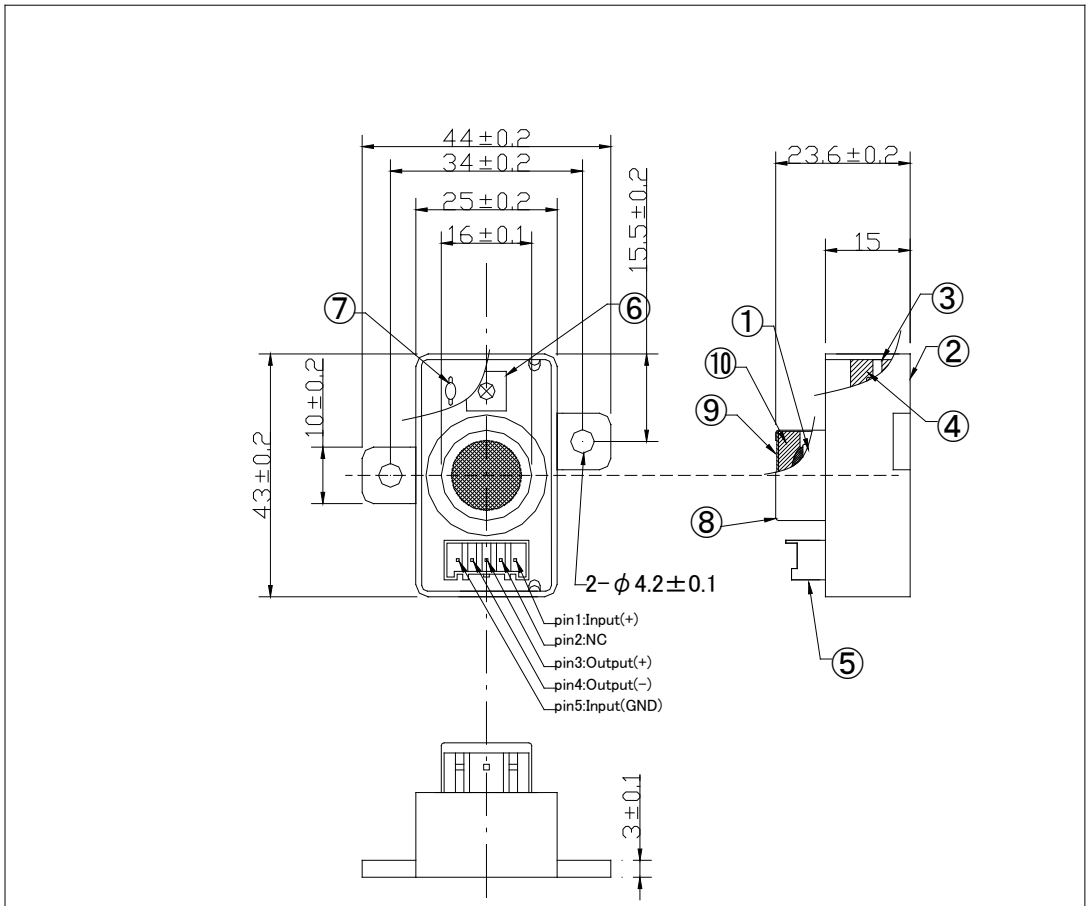
- At first, sensing unit is to be fixed at designated position. Electric driver is not applicable at all. When the unit is installed, both screw holes are to be in the horizontal relationship, not vertical relationship.
- Connector is to be inserted.
- After power is connected to the sensor, the module will be ready for detection service after 1 minute of operation (settling time)

8. Alarm levels

In most applications the recommended alarm level is 10%LEL, corresponding to 5000ppm in case of methane, 4000ppm in the case of Hydrogen. However, since around 10% of calibration error is to be permitted, adjustable output signal is to be lower than alarm point by 20 – 30mV. Then, methane gas concentration at alarm point is to be 4500 – 5500ppm. If this calibrated unit is applied to hydrogen detection, hydrogen gas concentration at alarm point is to be around 10% lower than methane because sensitivity to methane is around 10% lower than hydrogen in case of the same gas concentration, not LEL concentration.

9. Handling precautions

- Do not add excess of shock, and drop from high position. Doubtful unit is to be unused.
- Do not touch and turn the variable resistor. In case that resin for fixing of variable resistor is detached or peeled, the unit performance can not be guaranteed.
- Unit should be stored in sealed package to avoid humid and dew.
- Silicone glue, silicone putty, silicone rubber and etc. are not to be near the sensor installation location because they should be a cause of poisoning.
- Installation location of sensor has to be in the waterproof structure.
- This unit is to be continuously electrified in normal. If the ON-OFF driving is expected, please consult us.
- Do not be exposed in corrosive gases.



No	Parts name	Material	Remark
10	Filter	Active carbon	t5
9	Mesh	SUS316	—
8	Filter cover	SUS304	—
7	Resistor	—	200Ω ±1%、Pb-free
6	Variable resistor	—	10kΩ、Pb-free
5	Connector	PBT	NipponTanshi N1050A-9205
4	Desiccating agent	Resin	—
3	Circuit	FR4	—
2	Enclosure	Polycarbonate	—
1	Sensor	—	NAP-51A

Fig. Structure and Dimensions of NSU-131AF