FIGARO

product presentation

NGM2611-E13 Methane Pre-Calibration Module

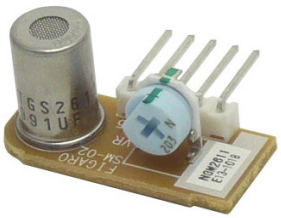
characteristic：

:: Factory calibration
* temperature compensating circuit
* Anti-interference sensor TGS2611 is adopted
* small volume
* Complies with R OHS requirements

apply：

Control of civilian natural gas gas alarm

The NGM2611* is a pre-calibrated module for natural gas gas detectors, with its precise calibration function derived from Figaro's temperature and humidity control system. The selected TGS2611-E00 sensor in this module features a filter that eliminates interfering gases like alcohol, thereby enhancing methane selectivity and improving response speed.

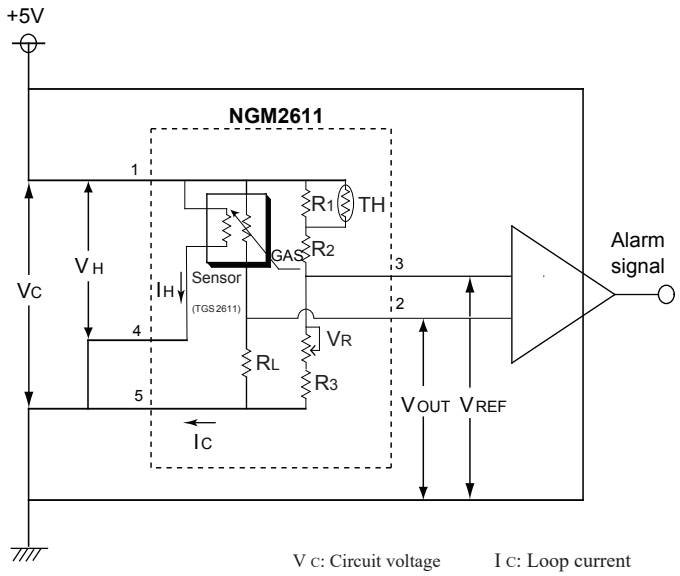


The most critical aspect of manufacturing reliable civilian gas alarms lies in alarm poi time-consuming process requiring substantial investment in calibration equipment. This n calibration process, enabling users to produce civilian natural gas detectors with greater e provides a sophisticated gas detection circuit design featuring a temperature compensa built-in thermistors, along with a low-power methane gas sensor with independently adju plug-in interface facilitates periodic sensor replacement. The input/output port simplifies mainboard, allowing easy conversion between methane and LPG gas detectors through simple module replacement. The module's design complies with EN50194 and UL1484 performance standards.

For sensor sensitivity characteristics, please refer to "Technical Information forTGS2611" and for further information on circuit design, please refer to "Application Notes for TGS2611".

* NGM (Natural Gas sensor Module)

circuit diagram：



V C: Circuit voltage
V H: Heater voltage
V OUT: Output voltage
V REF: Reference voltage

I C: Loop current
I H: Heater current

Pin connection:

The 5V DC power supply is connected to pin #1. The voltage comparator should be connected to pins #2 and #3. The circuit for detecting heater failures can be connected to pin #4 (in this configuration, both pins #4 and #5 must be grounded). When the gas sensor module detects the predetermined target gas alarm concentration, the v OUT value will reach or exceed the reference voltage (V REF), triggering the alarm condition in the module.

Note: As specified in Sections 2-6 of the "Technical Information for TGS2611", when a long-dead sensor is reactivated, its resistance (R s) will experience a sharp decline during the initial seconds after power restoration. This occurs even if no target gas is present and remains unstable until reaching equilibrium. During this critical recovery phase, should the voltage at RL RL exceed the reference voltage REF, alarm activation may be triggered. To prevent unintended alarms during the sensor's warm-up period, appropriate circuit modifications must be implemented in accordance with the provisions outlined in Sections 1-7 of the "Application Notes for TGS2611".

Component detai-
ls:

symbol	component	specifications	quantity
R1	deposited-carbon resi-stor	22kΩ	1
R2	deposited-carbon resi-stor	6.8kΩ	1
R3	deposited-carbon resi-stor	6.8kΩ	1
RL	deposited-carbon resi-stor	1.1~4.7kΩ	1
VR	potential device	20kΩ	1
TH	thermal resistor	25. C is 10kΩ B value =3370±1%	1
Sensor	gas transducer	Figaro TGS2611-E00	1
CN	connector	Nichiatsu MB5P-90S	1

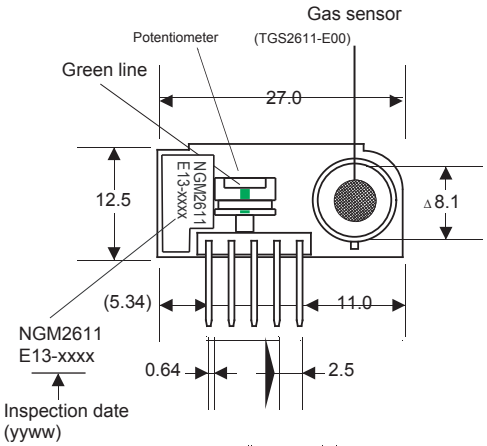
specificat-
ions :

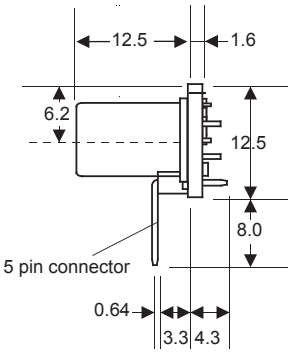
model			NGM2611 - E13
standard test conditions	Test gas conditions		Air methane 5000±100ppm 20. C ±2. C,65±5%RH
	Circuit conditions		V_H=5.0±0.05V DC V_C=5.0±0.05V DC
	Test warm-up time		48 hour
Electrical characte-ristics under stand-ard test conditions	reference voltage	V_{REF}(STD)	V_{OUT}(STD)±0.5V DC
	output voltage	V_{OUT}(STD)	2.5±0.5V DC

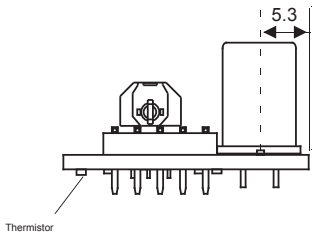
specificat-
ions :

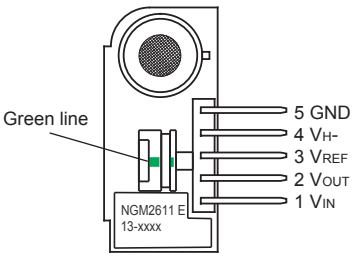
Recommended conditions of work	heater voltage	V_H	5.0±0.2V DC
	loop voltage	V_C	5.0±0.2V DC
	Minimum resistance between pin #2 and GND		2.5MΩ
	Minimum resistance between pin #3 and GND		
	going		0˚C~40˚C, 30~95%RH
	Different temperatures inside and outside the dete-ctor		⩽10. C max. (see note 1)
Electrical character-istics under working conditions	Heater current (Current between pins #1 and #4)	I_H	56±5mA
	loop current (Current between pins #1 and #5)	I_C	10mA (max)
	reference voltage	V_{REF}	1.0~4.0V DC (see note 2)
	output voltage	V_{out}	0.05- (V_C -0.05) V DC (see Note 3)

Structure and size:





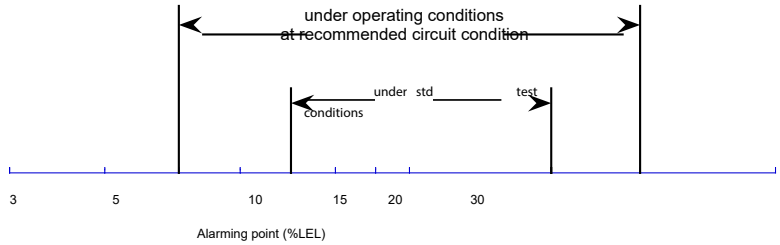




Unit : mm

Important note: When checking and confirming that the potent-iometer is in the correct position during initial setup before using the module, the NGM2611 has a green line for alignment. The green line on the potentiometer must be aligned with it.

performance guaran-
tee：



When the alarm point is 10%LEL, the performance of methane gas detector is guaranteed when NGM2611 is used

Note: When using NGM2611, the typical alarm tolerance for 10%LEL methane is shown in the diagram above. However, actual application conditions may differ as alarm thresholds can be affected by factors such as varying testing conditions or residual heat within gas detector housings. In summary, Feigaro neither explicitly nor implicitly guarantees the performance depicted here. Should significant discrepancies between actual detector performance and expected specifications be observed, please consult Feigaro for clarification.

Basic test circuit:

Absolute maximum rating (see note 4)	loop voltage	V_C	-0.3~+5.5V DC
	Heater current	V_H	-0.3~+5.5V DC (5.5V for up to 2 minutes)
	working temperature		-15. C~+55. C (maximum 95% RH)
	Storage temperature		-20. C~+60. C (anti-condensation)
	welding temperature		260. C (max. 10 seconds)

Note 1: If the heat generated by circuit components causes the internal temperature of the detector to exceed the external ambient temperature of the detector housing by 10°C or more, the calibrated alarm concentration value may drift due to reference voltage V_{REF} drift. If users cannot ensure that the temperature difference between the detector's interior and exterior remains below 10°C through proper design, they should consult Feicaro Company.

Note 2: If the temperature exceeds the recommended operating conditions, the reference voltage may exceed the rated range.

Note 3: If the following conditions occur, the output voltage may exceed the rated range:

* Methane concentration exceeds 20,000ppm

* During the warm-up period (due to initial reaction-see Technical Information for TGS2611 p.7 "Item 2-6 Initial Action") Therefore, when using NGM2611-E13, it is strongly recommended to set a fault threshold.

The recommended fault threshold is:

1.0V DC > Vref > 4.0V DC

0.05V DC > Vout > (Vc-0.05)V DC

Note 4: The detector design should comply with the above "recommended operating conditions ". However, the detection circuit design should not exceed the "absolute maximum rating" in any case, otherwise, the sensor may be damaged or cause performance degradation.

Consult Figaro before using NGM2611 for LP gas alarms outside of civil use.

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When purchasing the sensor, please scan the QR code to confirm the limited warranty.

https://www.figaro.co.jp/cn/pdf/Limited_Warranty_cn.pdf

The typical characteristics of the sensor are shown in this product specification. The actual characteristics of the sensor vary from product to product. Please refer to the specifications for each sensor.