



# NT-H2-PL40000

## Premium Line Electrochemical Hydrogen Sensor

D55398 rev.0 dated 03/05/2024



### Key Features

The NT-H2-PL40000 is a new Premium Line electrochemical gas sensor with 3 electrodes for the detection of Hydrogen in flammable range in a variety of gas detection applications. Exhibiting high performance with excellent resolution for high ppm detection as well as stability and output signal, this compact sensor (20.4 mm diameter) is suitable both for portable and fixed gas detection instruments.

The porous electrode technology enables accurate gas detection with high sensitivity. The mechanical design of the sensor gives optimum gas diffusion characteristics, and the hermetically sealed enclosure prevents costly electrolyte leakage.

### NET Premium Line Electrochemical Cells

The European Standard EN 45544-2 (Workplace atmospheres. Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours. Performance requirements for apparatus used for exposure measurement) specifies the performance requirements for electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours in workplace atmospheres, including sensors. This standard provides a consistent approach and framework for the assessment of performance criteria to manufacturers, test laboratories and users of apparatus.

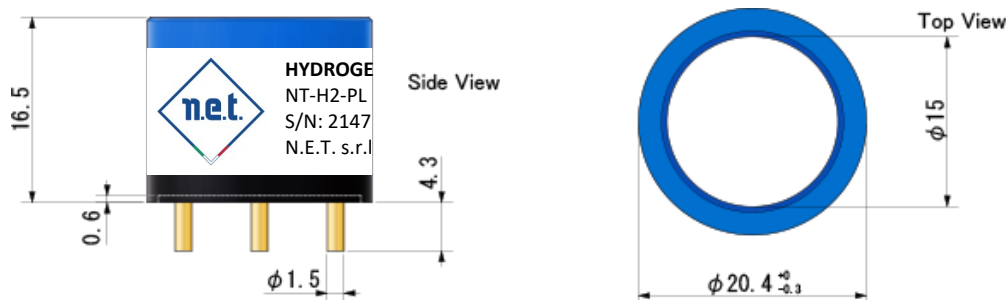
But, the standard states, "It is the manufacturer's primary responsibility to ensure that the apparatus meets the requirements laid down, including environmental influences

which can be expected to affect performance".

With this in mind, N.E.T. has designed its PREMIUM LINE: a range of electrochemical cells to exceed all the performance requirements of EN 45544-2 – including upper and lower limit of measurement, deviation of the measured values in clean air and in standard test gas, deviation of the measured values at all temperatures, pressures and at any humidity, time of response (t90, t50), time of recovery (t10, t50), over-range and stability.

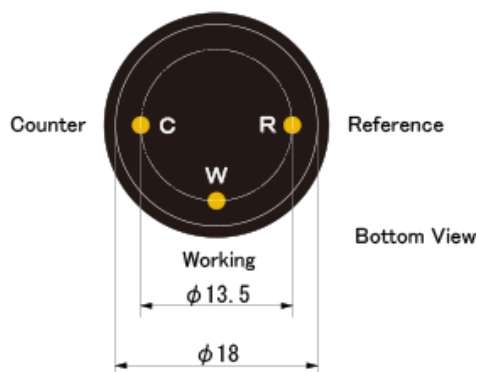
The Premium Line is manufactured exclusively for N.E.T. in Japan and includes sensors for CO, NO, NO2, H2, H2S, SO2, HCl, Cl2, NH3 (available in 4 different ranges) and the new H2S-HT and CO-HT cells for high temperatures.

### Mechanical specifications



All dimensions are in mm with a tolerance of +/- 0.1 mm unless stated otherwise

## Pinout



## Product specifications

Technical Specifications	Detection Gas	Hydrogen
	Detection Range	0 ~ 40000 ppm
	Maximum Overload	40000 ppm
	Output Signal	5 +/- 3 nA/ppm
	Repeatability	< +/- 2 %
	Resolution	10 ppm
	Typical Baseline Range (pure air)	< +/- 50 ppm
	Typical Response Time (t90, 20°C)	30 seconds
	Typical Baseline Shift (- 40 ~ + 40°C)	< +/- 50 ppm
	Long Term Output Drift	< 2%/month
	Expected Life Time	> 2 years
	Weight	4.5 g (approx.)
Operating conditions	Operating Temperature	- 40 ~ 50°C
	Operating Humidity	15 ~90 % RH
	Operating Pressure Range	1atm +/- 10 %
	Recommended Load Resistor	10 W
	Bias Voltage	Not required
	Position Sensitivity	None
	Recommended Storage Temp.	0 ~ 20°C
	Storage Life	Less than 6 months
	Warranty	2 years on mechanical defects only

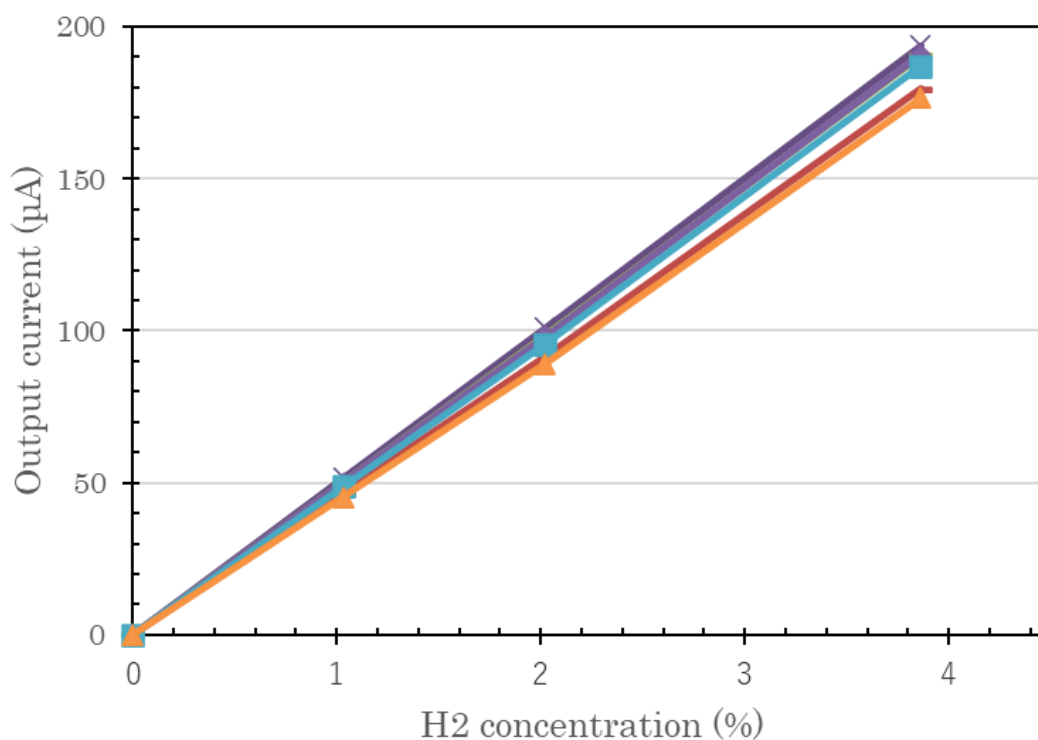
Performance data conditions: 20°C, 50%RH and 1013mBar

## Typical cross sensitivities

Gas	Test Gas Concentration (ppm)	Typical CO Concentration Equivalent (ppm)
Hydrogen	10000	10000
Carbon Monoxide	300	100
Hydrogen Sulfide	10	0
Sulphur Dioxide	20	0
Carbon Dioxide	5	0
Nitrogen Dioxide	10	0
Nitric Oxide	50	0
Ethylene	100	30
Ethanol	200	0
Ammonia	100	0

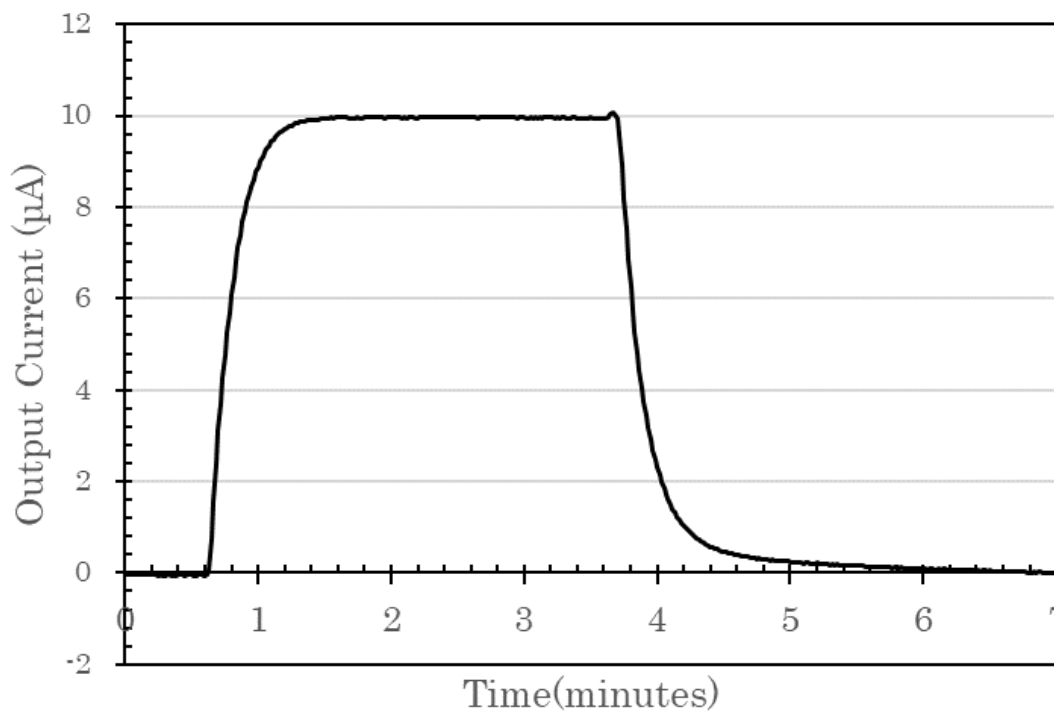
**Important note:** The values above are typical values and should not be used as a basis for cross calibration. Cross sensitivities may not be linear and should not be scaled either. Above data based on gassing for 5 minutes using test equipment. Should be noted some cross interference break through will occur if gas is applied for a longer period of time.

## Linearity

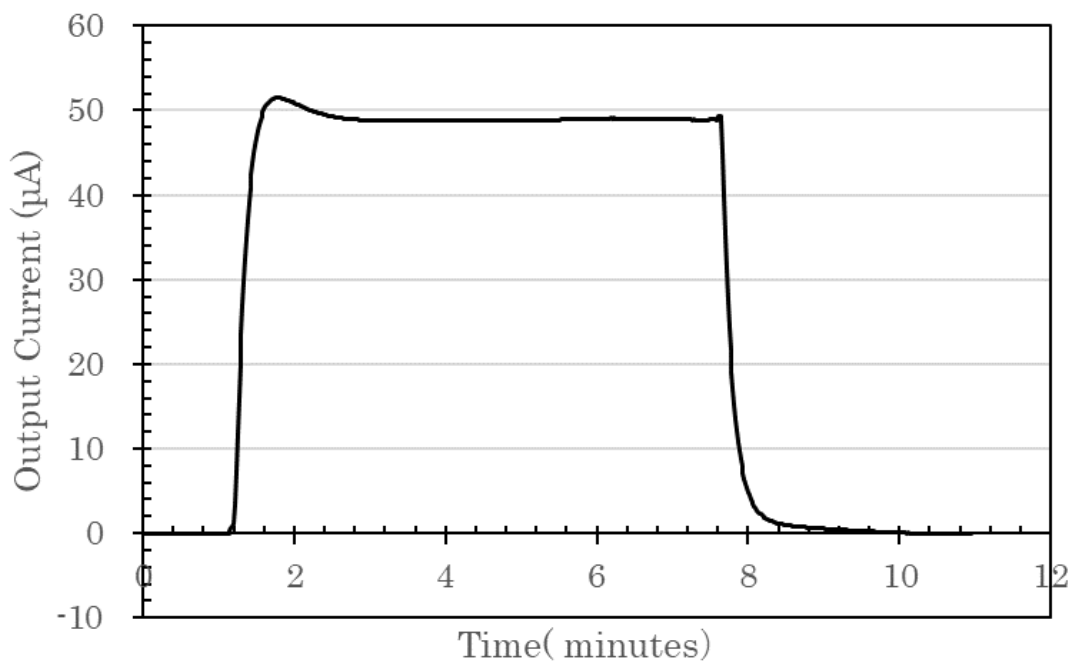


Linearity characteristics of NT-H2-PL40000 (25°C)

## Response and Recovery

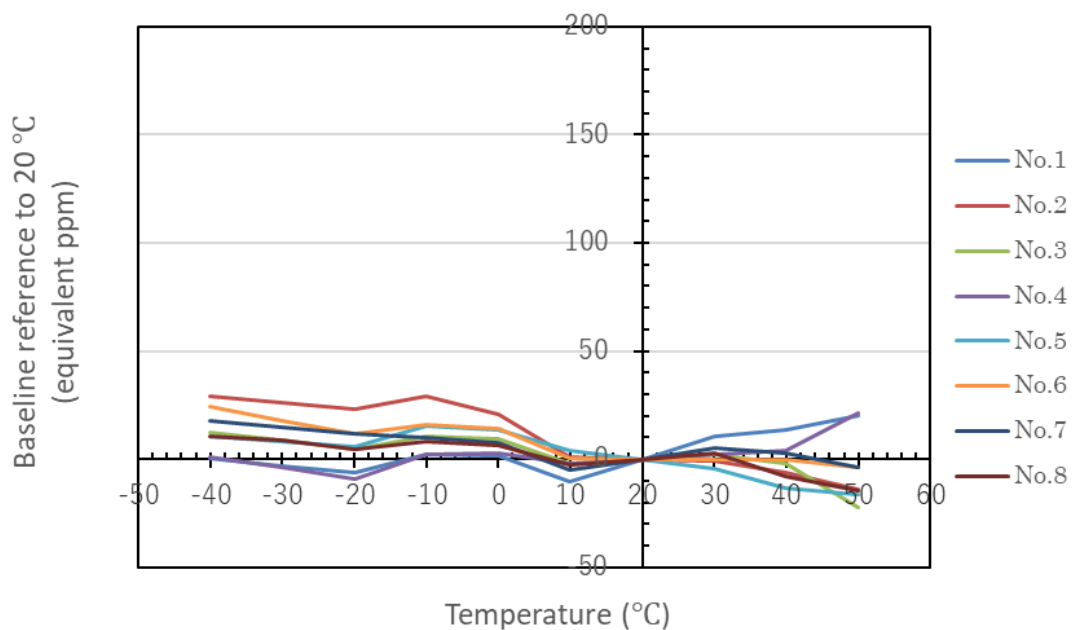


Response and Recovery characteristics of NT-H2-PL40000 — (H<sub>2</sub>:2000ppm, 20°C)



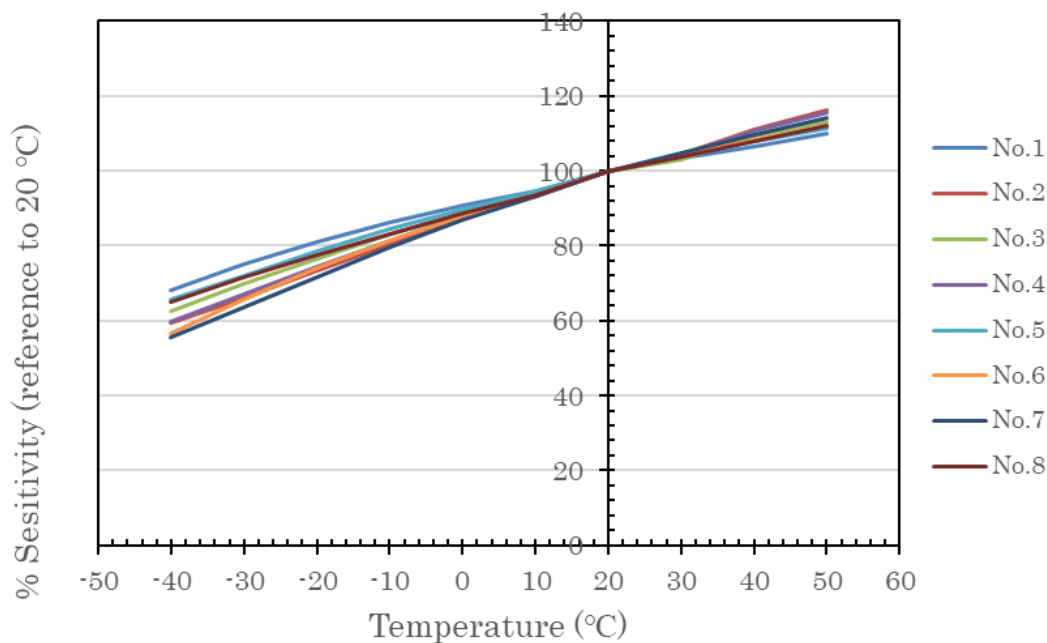
Response and Recovery characteristics of NT-H2-PL40000 — (H<sub>2</sub>:10000ppm, 20°C)

## Baseline shift

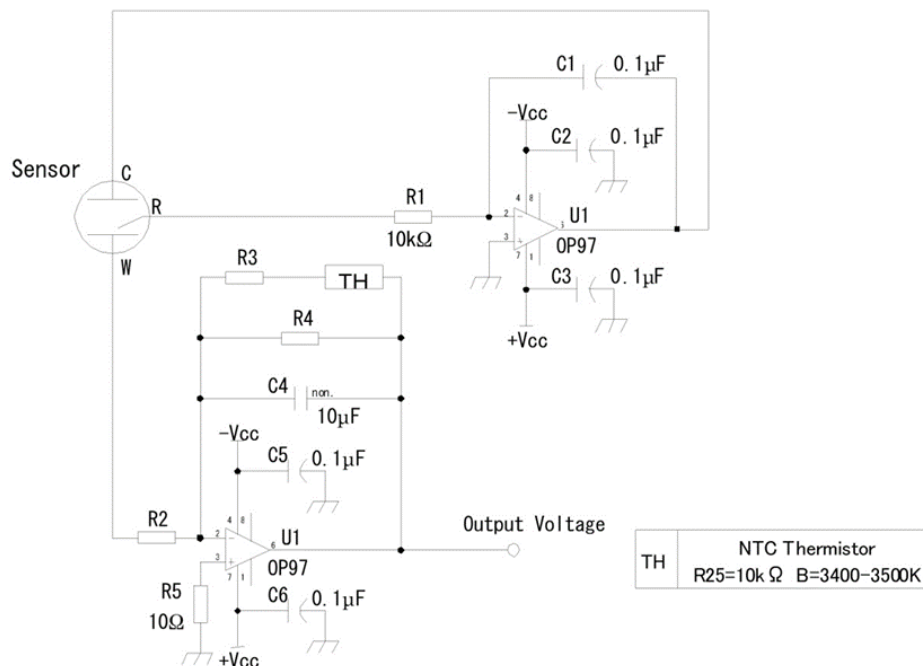


Baseline shift of NT-H2-PL40000

## Temperature dependency



## Recommended Circuit Diagram



In the circuit,  $R2=10\ \Omega$ ,  $R3=15.8\ \text{k}\Omega$  and  $R4=15.8\ \text{k}\Omega$ . The temperature dependence of the sensor is compensated by NTC thermistor that has 3435K of B constant. Other thermistor can be used, if the B constant is around 3500K and the resistant value ( $R25$ ) is 10 k $\Omega$ .

## Warranty and warning

- Use within specified conditions.
- It is customer's responsibility to confirm that device can be used under actual conditions of use without any problems.
- Calibration is required to maintain correct sensitivity. It is necessary approximately once every six months to one year.
- Sensor characteristics must be measured in clean air without noise gases.
- Electrode pins must be correctly connected. Wrong connection does not allow correct functions.
- Do not apply voltage directly to electrode pins.
- Do not bend pins.
- Do not solder to electrode pins directly. Use exclusive sockets.
- Do not use contact grease on electrode pins.
- Do not put excess strength on electrode pins.
- If sensor housing is damaged or scratched, do not use sensor.

N.E.T. has a policy of continuous development and improvement of its products. As such the specification for the device outlined in the data sheet may be changed without notice. In case of modification of the product, N.E.T. disclaims all liability.

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