

# NPH Series

## Solid State Low Pressure Sensors



### Applications

- Process control, P-to-I converters
- Pneumatic control systems
- HVAC controls
- Biomedical: Infusion pumps, sphygmomanometers, respirators
- Aerospace: Altimeters, barometers, cabin pressure sensors
- Computer peripherals

### Features

- Solid state, high reliability
- Standard TO-8 package suitable for PC board mount
- Low cost , small size
- Available in gauge, absolute, and differential pressure versions
- Media compatible with non-corrosive gases and dry air
- Thermal accuracy FSO 0.5% typical
- Overpressure capability to five times maximum rated pressure
- Three standard ranges: 0 to 10 inH<sub>2</sub>O (0 to 25 mbar), 0 to 1 psi (0 to 0.06 bar), and 0 to 5 psi (0 to 0.34 bar)
- Nonlinearity 0.05% FSO typical
- Standard 3/16 in OD pressure port
- Ceramic substrate with temperature compensation resistors

# NPH Series Specifications

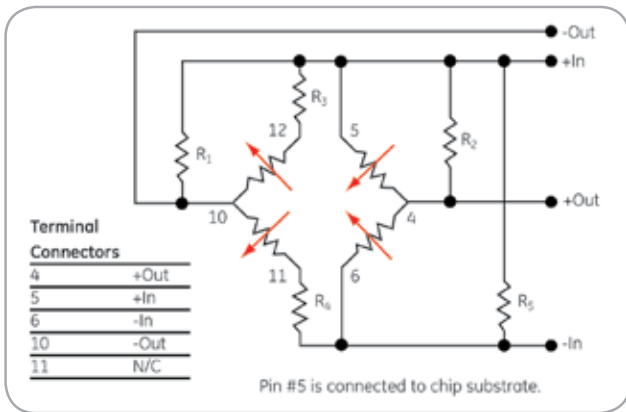
## Description

An integrated circuit silicon sensor chip is housed in a standard TO-8 electrical package that is printed circuit board mountable.

The latest techniques in micromachining have been used to ion-implant piezoresistive strain gauges into a wheatstone bridge configuration that is integrally formed on a micromachined silicon diaphragm. As with all NovaSensor silicon sensors, the NPH Series employs SenStable® processing technology, providing excellent output stability. Constant current excitation to the sensor produces a voltage output that is linearly proportional to the input pressure.

The user can provide standard signal conditioning circuitry to amplify the 100 mV output signal. The sensor is compatible with most non-corrosive gases and dry air.

A laser-trimmed, thick-film resistor network on a hybrid ceramic substrate provides temperature compensation.



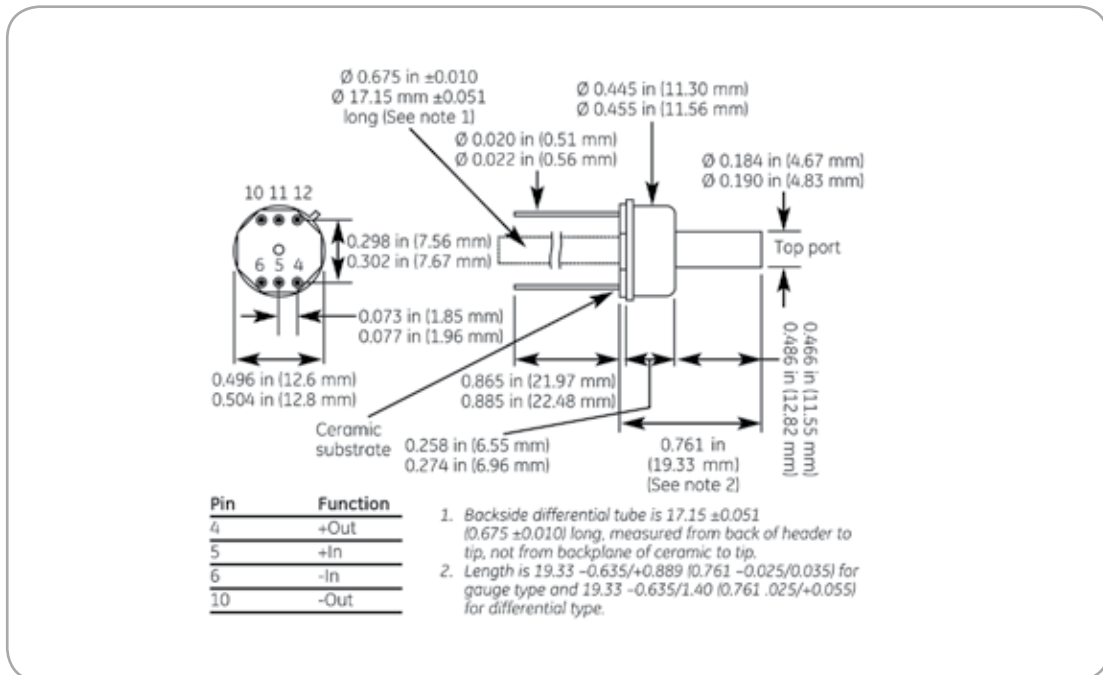
NPH Series schematic diagram

| Parameter   | Value   | Units              | Notes                          |
|---|---|--------------------|--------------------------------|
| <b>General</b>  |   |                    |                                |
| Pressure Range  | 0 to 10   | inH <sub>2</sub> O | (0 to 25 mbar) 0 to 2.5 kPa    |
|   | 0 to 1  | psi                | (0 to 7 bar) 0 to 7 kPa        |
|   | 0 to 5  | psi                | (0 to 0.34 bar) 0 to 30 kPa    |
| Maximum Pressure  | 5x  |                    | rated pressure <sup>(10)</sup> |
| <b>Electrical @ 77°F (25°C) Unless Otherwise Stated</b> |   |                    |                                |
| Input Excitation  | 1.5   | mA                 | 2 mA maximum                   |
| Insulation Resistance                                   | 100   | MΩ                 | @ 50 VDC                       |
| Input Impedance   | 3200  | Ω                  | ±25%                           |
| Output Impedance  | 5000  | Ω                  | ±20%                           |
| Bridge Impedance  | 5000  | Ω                  | ±20%                           |
| <b>Environmental</b>                                    |   |                    |                                |
| <b>Temperature Range</b>                                |   |                    |                                |
| Operating <sup>(9)</sup>                                | -40 to 257  | °F                 | (-40°C to 125°C)               |
| Compensated   | 32 to 158   | °F                 | (0°C to 70°C)                  |
| Vibration   | 10  | gRMS               | 20 to 2000Hz                   |
| Shock   | 100   | g                  | 11 milliseconds                |
| Life (Dynamic Pressure Cycle)                           | 1 x 10 <sup>6</sup>   | cycles             |                                |
| <b>Mechanical<sup>(11)</sup></b>                        |   |                    |                                |
| Weight  | <0.2  | oz                 | (<5 g)                         |
| Media Compatibility                                     | Non-corrosive gases and clean, dry air                                      |                    |                                |
| <b>Wetted Materials</b>                                 |   |                    |                                |
| Top Port  | Nickel, gold plated Kovar, silicone gel, gold wire, RTV, silicon and glass. |                    |                                |
| Bottom Port   | Gold plated Kovar, silicon, glass and RTV <sup>(9)</sup>                    |                    |                                |

| Parameter  | Min.  | Typical<br>2.5<br>kPa | Max. | Min.  | Typical<br>7 & 30<br>kPa | Max. | Units | Notes |
|--|-------|-----------------------|------|-------|--------------------------|------|-------|-------|
| <b>Performance Parameters(7), Compensated(1)</b> |       |                       |      |       |                          |      |       |       |
| Offset   | -8    | 2                     | 8    | -4    | 2                        | 4    | mV    |       |
| <b>Full Scale (FS) Output</b>                    |       |                       |      |       |                          |      |       |       |
| 2.5 kPa  | 25    | 50                    | 90   |       |                          |      | mV    | 2     |
| 7 kPa  |       |                       |      | 50    | 75                       | 150  | mV    | 2     |
| 30 kPa   |       |                       |      | 75    | 100                      | 125  | mV    | 2     |
| Linearity  | -1.0  | 0.1                   | 1.0  | -0.25 | 0.05                     | 0.25 | %FSO  | 3     |
| Hysteresis & Repeatability                       | -0.2  | 0.05                  | 0.2  | -0.2  | 0.05                     | 0.2  | %FSO  |       |
| <b>Thermal</b>                                   |       |                       |      |       |                          |      |       |       |
| Accuracy of Offset                               | -3    | 0.5                   | 3    | -2    | 0.5                      | 2    | %FSO  | 4     |
| Accuracy of FSO                                  | -3    | -1                    | 3    | -1.5  | -0.5                     | 1.5  | %FSO  | 4     |
| Thermal Hysteresis                               | -0.75 | 0.5                   | 0.75 | -0.5  | 0.2                      | 0.5  | %FSO  | 5     |
| Short-Term Stability of Offset                   |       | 5                     |      |       | 5                        |      | μV/V  | 6, 11 |
| Short-Term Stability of FSO                      |       | 5                     |      |       | 5                        |      | μV/V  | 6, 11 |

1. Performance with offset, thermal accuracy of offset, and thermal accuracy of FSO compensation resistors.
2. FSO with 1.5mA input excitation.
3. Best fit straight line.
4. 32°F to 158°F (0°C to 70°C) with reference to 77°F (25°C)
5. 32°F to 158°F (0°C to 70°C), by design
6. Normalized offset/bridge voltage -100 hrs, typical value, not tested in production.
7. All values measured at 77°F (25°C) and at 1.5 mA, unless otherwise noted.
8. Reduced performance outside compensation range.
9. Backside differential tube is nickel or Kovar.
10. Top side pressure.
11. Typical specifications are for reference only; absolute values may vary.

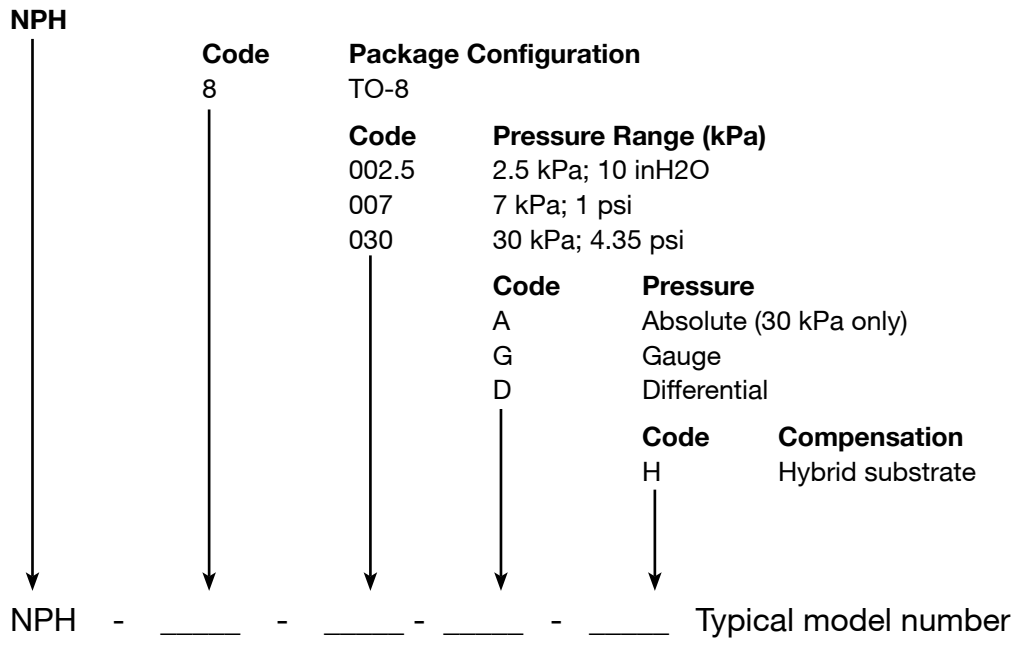
# NPH Series Specifications



NPH Series package diagram

## Ordering Information

The code number to be ordered may be specified as follows:



**Amphenol**  
**Advanced Sensors**

[www.amphenol-sensors.com](http://www.amphenol-sensors.com)

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## Amphenol:

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[NPH-8-172DH](#)



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- Подбор аналогов;
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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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