

# NPI-15VC Series

Voltage Compensated,  
Media Isolated, High  
Pressure Sensors



## Applications

- Process control systems
- Hydraulic systems and valves
- Automobiles and trucks
- Biomedical instruments
- Refrigeration and HVAC controls
- Appliances and consumer electronics
- Ship and marine systems
- Aircraft and avionic systems

## Features

- Solid state, high reliability
- High sensitivity with  $100 \text{ mV} \pm 1\% \text{ FSO}$  at 10 VDC
- 316L stainless steel, IsoSensor design
- Linearity 0.1% FSO typical
- Thermal accuracy 0.2% FSO typical
- Four standard ranges: 500, 1000, 3000, and 5000 psi (34.5, 69, 207, and 345 bar) available in absolute or sealed gage
- Standard configurations include:
  - 1/2–20 UNF threaded male port with 1.0 in (24.4 mm) flange
  - 0.59 in (14.98 mm) diameter x 0.87 in (22.09 mm) long cylinder with o-ring seals
  - 1/4–18 NPT male port with 7/8 in flange
  - 1/8–27 NPT male port with 7/8 in flange
- Custom configurations and other pressure ranges available. Please consult factory

# NPI-15VC Series Specifications

## Description

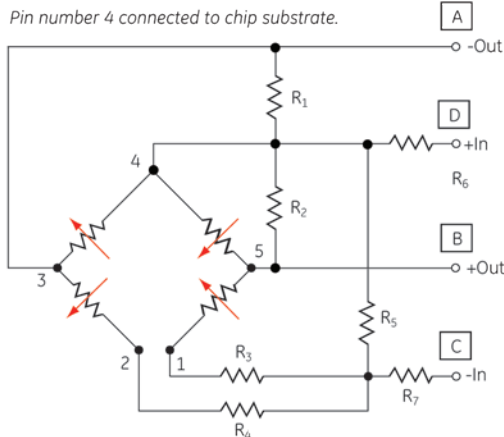
The NovaSensor voltage compensated NPI-15VC Series offers the performance of our current compensated sensors with the convenience of using a voltage supply. Voltage compensation allows the sensor to be connected directly to the power supply, thereby eliminating the need for additional components to construct a constant current source. These sensors enable field interchangeability with a calibrated FSO of  $100 \text{ mV} \pm 1 \%$ .

As with all NPI media isolated sensors, they are designed to operate in hostile environments and yet give the outstanding sensitivity, linearity, and hysteresis of a silicon sensor. The piezoresistive sensor chip is housed in a fluid-filled cylindrical cavity and isolated from the measured media by a stainless steel diaphragm and body. The NPI Series employs SenStable® processing technology, providing excellent output stability.

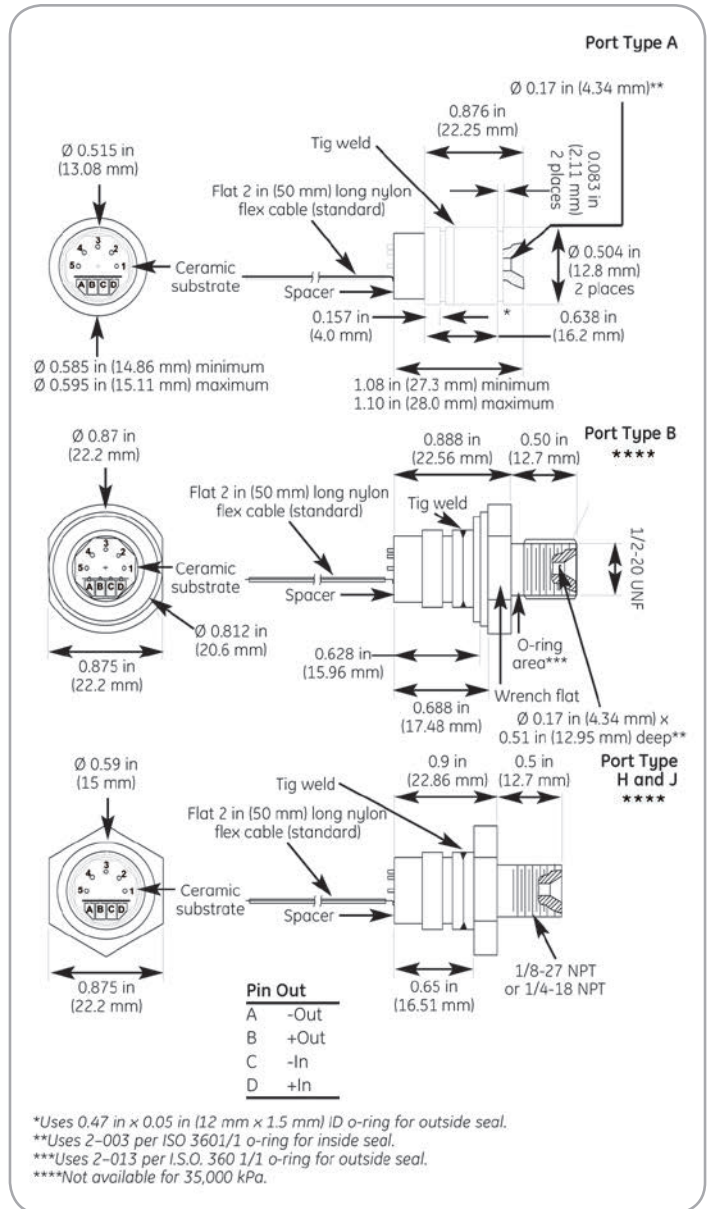
The modular design allows for a variety of pressure port modules which are hermetically welded to the sensor head module. Standard types A, B, H, and J are shown to the right.

For compensation of temperature effects, a resistor network is supplied on a hybrid ceramic substrate. The

IsoSensor design minimizes temperature errors to provide a maximum offset error of 1.0% FSO and a maximum full scale output error of 0.75% FSO over the  $32^\circ\text{F}$  to  $158^\circ\text{F}$  ( $0^\circ\text{C}$  to  $70^\circ\text{C}$ ) compensated range.



NPI-15VC Series schematic diagram



NPI-15VC Series dimensions

# NPI-15VC Series Specifications

| Parameter                                                               | Value                                                    | Units  | Notes                  |      |       |
|-------------------------------------------------------------------------|----------------------------------------------------------|--------|------------------------|------|-------|
| General                                                                 |                                                          |        |                        |      |       |
| Pressure Range                                                          | 0 to 500                                                 | psi    | 3,447 kPa              |      |       |
|                                                                         | 0 to 1,000                                               | psi    | 6,894 kPa              |      |       |
|                                                                         | 0 to 3,000                                               | psi    | 20,682 kPa             |      |       |
|                                                                         | 0 to 5,000                                               | psi    | 34,470 kPa             |      |       |
| Maximum Pressure                                                        | 2 x                                                      |        | rated pressure         |      |       |
| Electrical @ 77°F (25°C) unless otherwise stated                        |                                                          |        |                        |      |       |
| Input Excitation                                                        | 10                                                       | VDC    | 15 VDC maximum         |      |       |
| Insulation Resistance                                                   | 100M                                                     | Ω      | @ 50 VDC Input         |      |       |
| Impedance (minimum)                                                     | 4,000                                                    | Ω      |                        |      |       |
| Output Impedance                                                        | 5,000                                                    | Ω      | ± 20%                  |      |       |
| Bridge Impedance                                                        | 5,000                                                    | Ω      | ± 20%                  |      |       |
| Environmental                                                           |                                                          |        |                        |      |       |
| Temperature Range                                                       |                                                          |        |                        |      |       |
| Operating <sup>(9)</sup>                                                | -40 to 257°F                                             |        | (-40°C to 125°C)       |      |       |
| Compensated Range                                                       | 32 to 158°F                                              |        | (0°C to 70°C)          |      |       |
| Vibration                                                               | 10                                                       | gRMS   | 20 to 2000Hz           |      |       |
| Shock                                                                   | 100                                                      | g      | 11 milliseconds        |      |       |
| Life (Dynamic Pressure Cycle)                                           | 10 x 10 <sup>6</sup>                                     | cycles |                        |      |       |
| Mechanical <sup>(1)</sup>                                               |                                                          |        |                        |      |       |
| Weight                                                                  | 0.06                                                     | lb     | (28 g) NPI-15A-XXX     |      |       |
|                                                                         | 0.10                                                     | lb     | (47 g) NPI-15B/H/J-XXX |      |       |
| Media Compatibility                                                     | All corrosive media compatible with 316L stainless steel |        |                        |      |       |
| Case and                                                                |                                                          |        |                        |      |       |
| Diaphragm Material                                                      | 316L stainless steel                                     |        |                        |      |       |
| Recommended O-Ring Type A: 0.472 in (12 mm) ID x 0.059 in (1.5 mm) wall |                                                          |        |                        |      |       |
| Type B: 2-013 per ISO 3601/1                                            |                                                          |        |                        |      |       |
|                                                                         |                                                          |        |                        |      |       |
| Parameter                                                               | Units                                                    | Min.   | Typical                | Max. | Notes |
| Performance Parameters 500, 1,000, 3,000, & 35,000 psi (Note 1,8)       |                                                          |        |                        |      |       |
| Full Scale Output                                                       | mV                                                       | 99     | 100                    | 101  | 2     |
| Linearity                                                               | %FSO                                                     | -0.35  | 0.1                    | 0.35 | 3     |
| Hysteresis and Repeatability                                            | %FSO                                                     | -0.05  | 0.01                   | 0.05 |       |
| Thermal Accuracy of Offset                                              | %FSO                                                     | -1.0   | 0.2                    | 1.0  | 4     |
| Thermal Accuracy of FSO                                                 | %FSO                                                     | -0.75  | -0.2                   | 0.75 | 4     |
| Thermal Hysteresis                                                      | %FSO                                                     | -0.2   | ±0.1                   | 0.2  | 5     |
| Short-Term Stability of Offset                                          | μV/V                                                     |        | 5                      |      | 6     |
| Short-Term Stability of FSO                                             | μV/V                                                     |        | 5                      |      | 6     |
| Long-Term Stability of Offset                                           | %FSO                                                     |        | 0.1                    |      | 7     |
| Long-Term Stability of FSO                                              | %FSO                                                     |        | 0.1                    |      | 7     |

- Performance with offset, thermal accuracy of offset and thermal accuracy of FSO compensation resistors.
- FSO with 10 VDC.
- Linearity by best fit straight line.
- 32°F to 158°F (0°C to 70°C) with reference to 77°F (25°C).
- 32°F to 158°F (0°C to 70°C), by design.
- Normalized offset/bridge voltage\_100 hours, typical value, not tested in production.
- One year, typical value, not tested in production.
- All values measured at 77°F (25°C) and at 10 VDC, unless otherwise noted.
- Reduced performance outside compensation range, not tested in production.

## Warranty

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## Ordering Information

### NPI-15

#### Code Pressure Port Type

|   |            |
|---|------------|
| A | No port    |
| B | 1/2-20 UNF |
| H | 1/4-18 NPT |
| J | 1/8-27 NPT |

#### Code Pressure Ranges in psi

|     |                                    |
|-----|------------------------------------|
| 500 | 500 psi (3447 kPa)                 |
| 1KØ | 1000 psi (6894 kPa)                |
| 3KØ | 3000 psi (20,632 kPa) NPI-15A only |
| 5KØ | 5000 psi (34,470 kPa) NPI-15A only |

#### Code Compensation

|   |                             |
|---|-----------------------------|
| A | Absolute                    |
| S | Sealed gauge                |
| V | Constant Voltage Excitation |

**NPI-15**    **Typical model number**



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## Amphenol:

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А